



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
WASHINGTON, D.C. 20546

IN REPLY REFER TO: BCN-1

DEC 27 1966

Subject: Request for Proposal Number 10-1243

Gentlemen:

The National Aeronautics and Space Administration invites you to submit a proposal to perform the project definition effort requisite to the design and development of an Integrated Medical and Behavioral Laboratory Measurement System. General Information regarding this procurement is provided as ATTACHMENT I. ATTACHMENT II sets forth the Statement of Work, Period of Performance, Reporting Requirements and other schedule provisions which will be included in any contract resulting from this request.

It is anticipated that two or more fixed price contracts will result from this solicitation and will include General Provisions (NASA Form 247, June 1966) ATTACHMENT III, as modified by ATTACHMENT IV, Modification of the General Provisions.

Only Contractors with the capability of performing through the design and development phases of this project will be considered for award of the project definition phase. However, award of a contract for the project definition phase is no assurance of award of a contract for any subsequent phase. Furthermore, the Government reserves the right to introduce other Contractors into the competition at any time.

Access to classified material will be required during the conduct of the work. It is conceivable that some of the data generated in the course of the work will also be classified. Therefore, the Contractor's facility must be cleared up to and including SECRET.

Your proposal must be prepared in three physically separate parts entitled respectively "Technical Proposal", "Business Proposal" and "Subsequent Phase Capability Supplement" in accordance with ATTACHMENT V, General Instructions for Preparation of Proposals. This separation of proposal components will enable evaluation of each portion to be made on the basis of its own merits.

The technical portion of your proposal must be submitted in thirty copies, the cost portion in thirty copies, and the Subsequent Phase Capability Supplement portion also in thirty copies, to NASA, Headquarters Contracts Division, Code BCN-1, Washington, D. C. 20546, Attention: Mitchell H. Gordon, and must be received not later than 2:00 p.m. EST, February 10, 1967. Proposals which are hand carried should be brought to Room 607, Reporters Building, 300 7th and D Streets, S. W., Washington, D. C. To prevent opening by unauthorized individuals, your proposal should be marked with a reference to RFP 10-1243. The proposal must be signed by an official authorized to bind the offeror, and must contain a statement to the effect that it is firm for a period of 60 days. In addition, the series of certificates and representations referred to in ATTACHMENT V, General Instructions for Preparation of Proposals, must be properly executed and returned with your proposal. Proposals must set forth full, accurate and complete information as required by this Request for Proposal (including attachments). The penalty for making false statements in proposals is prescribed in 10 U.S.C. 1001.

A preproposal briefing conference will be held at 1:00 p.m. EST, in the Auditorium, Museum of Natural History, 10th Street and Constitution Avenue, N. W., Washington, D. C., on January 12, 1967. The purpose of this conference is to enable Contractor representatives to ask and have answered questions of both a technical and business nature. Questions should be submitted in writing to Mr. Gordon at the address listed for submission of proposals and should be received by 9:00 a.m. EST, January 9, 1967. Because of space limitations, representation at the conference must be limited to three persons per firm. If you plan to attend this briefing conference, please notify Mrs. Cynthia George, area code 202, 962-1250 and indicate the number of persons who will attend.

This Request for Proposal does not commit the Government to award a contract or to pay any costs incurred in the preparation of a response to this request or to procure or contract for the services. The Government reserves the right to reject any or all proposals or to negotiate separately with any source considered qualified.

The Contracting Officer is the only individual who can legally commit or obligate the Government to expenditure of public

funds. No cost chargeable to the proposed contract can be incurred before receipt of a fully executed contract or specific authorization from the Contracting Officer.

Sincerely yours,

Herbert S. Snyder
Herbert S. Snyder
Contracting Officer

Attachments:

1. General Information
2. Schedule Articles
3. General Provisions (NASA Form 247, June 1966)
4. Modification of the General Provisions
5. General Instructions for Preparation of Proposals

ATTACHMENT I

GENERAL INFORMATION

A. BACKGROUND

Medical experiments have been an integral part of the Manned Space Flight Program beginning with Project Mercury and continuing through Project Gemini. Likewise, a series of experiments are currently planned for Project Apollo. For the past three years, NASA has conducted a study effort to identify the information required for the support of man for long-duration missions and to provide basic data of interest to clinical medicine and allied biomedical disciplines. To date, this study effort has identified measurement requirements, a conceptual design of measurement systems, and a time-line and feasibility analysis of twenty-three (23) proposed measurement packages.

B. OBJECTIVE

The final objective is an Integrated Medical and Behavioral Laboratory Measurement System which optimizes commonality of equipment and flight crew tasks and which is designed so that it can be utilized in a refurbished Command Module, Lunar Module (LM), and/or in an Orbital Workshop. This system will be capable of accomplishing specified measurements and will be designed on a modular basis to accommodate additional measurements and experiments, (including replacements thereof) which will be submitted to NASA on a continuing basis.

It is anticipated that an Integrated Medical and Behavioral Laboratory Measurement System will consist of four elements and that each element will contain a relatively discrete measurement capability in one of the following areas: physiological; biochemical; performance; and data management and display.

C. PURPOSE AND SCOPE

The efforts involved consist of four phases:

Phase A - Advanced Studies

Phase B - Project Definition

Phase C - Design

Phase D - Development and Operations

Phase A has been completed and has resulted in the following document: "Biological Measurement of Man in Space," Time-Line Feasibility Analysis for AAP Biomedical Experiment Program, Final Report, Volume VI, Lockheed Missiles and Space Company, January 1966, Contract NASW-1071, Unclassified. This document which is pertinent to the Phase B statement of work is available to prospective offerors as X66-16369 from the NASA Scientific and Technical Information Facility, P. O. Box 33, College Park, Maryland.

Phase B will be a definition study and will include (a) analysis and refinement of proposed medical and behavioral measurements and experiments; (b) survey of candidate measurement equipment; (c) presentation of schedules and resource requirements for an Integrated Laboratory Measurement System definition; (d) recommendations regarding on-board versus post-flight analysis of flight collected biological specimens; (e) recommendations regarding modular approach to system design; (f) identification of data management system requirements; (g) preliminary system design concept; (h) preparation of preliminary program and management plans; and, (i) a statement of work and a cost proposal for the conduct of Phase C.

Phase C will include the detailed design of the final project concept and the implementation of the plans which evolve from Phase B. The end products of Phase C include a functioning integrated medical and behavioral laboratory measurement system, fabricated in modular form, and installed in working order in either: a refurbished Command Module mock-up, a LM ascent stage mock-up, or a segment of an Orbital Workshop mock-up (to be subsequently decided by NASA), contract end item specifications (performance, design, and test) and design drawings and performance specifications of NASA selected equipment, time-line testing results of specified measurements/experiments, and program and management plans for the Phase D effort, the development of flight systems.

Phase D effort includes final hardware design and development, fabrication, tests and operations of an integrated medical and behavioral laboratory measurement system.

It is anticipated that the Phase C contract will cover a thirteen-month performance period and Phase D contract will cover a twenty-two month performance period.

The purpose of the above information is to define the Contractor tasks to be accomplished by the Phase B Contractor. Information regarding Phases C and D is presented for the purpose of assisting the Phase B Contractor in performing his tasks.

D. MANAGEMENT GUIDELINES

Programmatic management for the entire effort is the responsibility of the Director, Medical Science and Technology, Space Medicine Directorate, Office of Manned Space Flight, NASA Headquarters. This office will also provide technical direction for the project definition phase.

Technical direction of the design and subsequent development effort will be the responsibility of the Engineering and Development Directorate, Manned Spacecraft Center.

Plans for the technical monitoring of Phases C and D will be developed jointly by the Engineering and Development Directorate, Manned Spacecraft Center, and the Medical Research and Operations Directorate, Manned Spacecraft Center, and the Space Medicine Directorate, NASA Headquarters, as the specific requirements for technical monitorship become definitive.

APPACHMENT II

SCHEDULE ARTICLES

ARTICLE I. SCOPE OF WORK

The purpose of this contract is to provide the National Aeronautics and Space Administration with the project definition effort (Phase B) and documentation requisite to the design (Phase C) and development (Phase D) of an Integrated Medical and Behavioral Laboratory Measurement System.

ARTICLE II. STATEMENT OF WORK

The Contractor shall provide all personnel, facilities, equipment, and materials (except as otherwise provided herein) necessary to accomplish and shall accomplish the program of work set forth below:

A. Analyze and refine the proposed measurements of the twenty-three (23) measurement packages of Medical and Behavioral experiments identified in Annexes A and B.

1. This analysis and refinement will include at least:

- a. The maintenance of the stated objective(s) of each of the measurement packages and experiments, and
- b. The identification of equipment required for the conduct of the measurements.

B. Conduct a survey and identify candidate equipment and methodologies which are required for specified measurements.

1. The information derived will be presented in a manner to display, at least:

- a. Source;
- b. Development Status;
- c. Projected development time to flight hardware;
- d. Weight, power and volume requirements; (R)
- e. Sensitivity, reliability, and validity; and
- f. Contractor's recommendation, with rationale, regarding selection for use in Phase C.

2. The following equipment developed or being developed by the Government for use in Projects Gemini and Apollo will be considered in Phase B and will be utilized in Phase C unless specific waiver is granted by NASA:
 - a. Blood pressure measurement system;
 - b. Electrocardiogram;
 - c. Vectorcardiogram;
 - d. Phonocardiogram;
 - e. Thoracic blood flow measurement system;
 - f. Urine volume measurement system;
 - g. Body (core) temperature measurement system;
 - h. Twelve point thermal lead measurement system;
 - i. Respiratory gas volume meter and gas analyzer;
 - j. Impedance pneumograph;
 - k. Mechanical ergometer;
 - l. Electroencephalogram;
 - m. Egocentric visual location of horizon measurement system;
 - n. Medical Kit.
3. Specifications for the equipment listed in paragraph 2 will be provided to the selected Contractor within five days following award of contract.
4. NASA will decide which candidate equipment and methodologies will be selected and utilized in the Phase C portion of the effort.

C. Perform analysis and present approach for system design, and separately present a recommended approach for implementation of the system design during development, Phase D, of an Integrated Laboratory Measurement System including the measurements identified in Annex B.

1. The analysis and display of information shall include at least the following elements:

- a. schedules;
- b. funding requirements; and,
- c. weight, power and volume requirements

2. The system definition shall be compatible with the constraints imposed by the refurbished Command Module, Lunar Module, and Orbital Workshop, and with the constraints imposed by mission operations e.g., exposure of equipment to space environmental conditions. Apollo spacecraft systems capabilities, and constraints imposed by the Orbital Workshop are contained in Annex C. General guideline design information is stated below:

Maximum experiment equipment	100 ft ³
Pressure	5 psia
Gas composition	Pure oxygen, or oxygen plus nitrogen
Total allowable weight for medical experiment equipment	250 lbs.
Power = 29 + 2 d.c. and 3 phase 400 cps a.c.	1000 watts for medical experi- ments
Temperature	75°F ± 15°F
Relative humidity	40 - 70%
Radiation	4 mr/ft ² /day
Data transmission (medical experiment equipment)	10K bits/sec of PCM telemetry
Acceleration	7 G's longitudinal
Vibration	.02 G ² /cps at 20 cps and Linear to .09 G ² /cps at 400 cps Constant at .09 G ² /cps to 800 cps

3. Weight, power and volume requirements, along with system flexibility and adaptability, are important considerations in this study.
4. Indicate approach and capacity, and to the degree practical, projected resource requirements, to include as yet undefined measurements into an integrated laboratory measurement system.
- D. Recommend an approach to the conduct of measurements of man in space in terms of on-board analysis of collected biological specimens versus post-flight analysis of specimens collected in-flight.
 1. This recommendation shall include trade-off analysis which considers, but is not limited to the following:
 - a. Equipment requirements;
 - b. Crew time, (including training requirements);
 - c. Sample storage, preservation and retrieval problems;
 - d. Accuracy of specimen analysis which might be achieved; and
 - e. Effect of recommended approach on measurement capability for future long-duration missions.
 2. The Contractor will demonstrate his appreciation of the problems involved in these alternative approaches by identifying sources of pertinent information and by the recommendation of prerequisite studies required for a final decision regarding the on-board versus post-flight analysis approaches.
- E. Identify an approach to the modular design and packaging of an Integrated Measurement System which includes an optimum number of measurements per flight, and an orderly and sequential approach to collection of required information, and which considers, but is not limited to:
 1. System flexibility
 - a. Capability to interchange modules with measurement capability different from original specifications;
 - b. Capability for altering the function of any specific module by the replacement of specific plug-in components.
 - c. Capability for inflight replacement of module components in the event of malfunction.

2. Early fabrication of integrated equipment modules which could be available for early Apollo Applications Program (AAP) flights and which would be capable of accomplishing a limited number of measurements (fewer than the number specified in Annex B). Within five (5) days of award of contract, NASA will supply information to the Contractor on the parameters for selected AAP flights.

3. Commonality of rack, display, and data management equipment to support a full Integrated Laboratory Measurement System, or to support any part of the system which might be represented by the modules described in E(2) above.

4. A major goal in the system definition is the optimization of common-use equipment. This goal is directed toward reducing the complexity of system design and toward reducing the time requirements on the flight crew for the conduct of in-flight measurements and experiments.

5. The system design shall be such that there is minimum interdependency of one module with another. This objective is directed toward eliminating the situation wherein a single module failure would cause failure of other system elements or modules. The optimization of redundancy characteristics in module and system design, to further reduce probability of equipment failure, is an additional objective. These redundant features, however, should not increase system complexity.

F. Definition of a data management system incorporating all data requirements generated by the integrated laboratory modules, and defining interface requirements with the principle space vehicle data management and telemetry system.

1. This definition shall include, but need not be limited to the following:

- a. On-board collection;
- b. Selective on-board interpretation (and display);
- c. Storage;
- d. Data dump (or selective data dump);
- e. Ground-based recording and retrieval; and (R)
- f. Data discrimination (post-flight).

G. Prepare and describe a preliminary system design concept.

This design concept shall include, but not necessarily be limited to, the recommended approaches to accomplishing the measurements identified in Annex B and the systems engineering concepts involved in the approach. This design concept shall be consistent with information generated in response to tasks (A) through (F) of this statement of work.

H. Develop preliminary program and management plans for Phase C effort. The extent to which these plans are developed should be commensurate with the magnitude of the project and crew safety considerations.

1. Program Plan - The Program Plan is the top level document which interrelates the Management Control Plan and Functional Plans as identified below. This document shall be the basic document which describes the overall plan for the definition of the Integrated Medical and Behavioral Measurement Laboratory System for AAP. The plan shall summarize the method by which the Contractor intends to comply with the statement of work for Phase C. The plan shall summarize management and control functions, design approaches, test program requirements, and plans, manufacturing, quality assurance requirements, logistic support requirements, and such other planning documents as are specified in the contract. It shall include master phasing charts and milestone charts for the overall definition program; general management, technical, manufacturing, facilities, and support schedules, manpower requirements for the performance of the project; and manpower phasing charts.
2. Management Plan - The Management Plan shall include and describe:
 - a. The responsibility and authority to be delegated to the Program Manager;
 - b. The responsibility and authority delegations to be made from the Program Manager;
 - c. The methods of operation to be employed in utilizing the Management Control Plan for program and task progress control;
 - d. Procedures for the control of subcontractor task progress, expenditures, and technical approach;

- e. Procedures for design control (release and change) and financial control (budget and expenditures); and
 - f. Contractor staffing control (direct and indirect personnel) in accordance with task manpower requirements.
3. Management Control Plans (MCP) - These documents are a series of plans corresponding to the Contractor's organization which in total will account for all of the Contractor and subcontractor activities on the program (direct and indirect). Each MCP shall include the following:
- a. The organizational unit and individual responsible for the plan;
 - b. The tasks and ensuing products that shall be accomplished by the organization grouped by the suborganizations responsible for performing them. Each task must have a product;
 - c. The scheduled start and completion date for each task and the subsequent use or need for each product;
 - d. Integrated schedule of all tasks in the MCP indicating constraints and interface with tasks of other plans;
 - e. The effort required for logical groupings of tasks in man-months spread over time;
 - f. The tasks performed by a subcontractor, one level of detail less than for in-house work. These tasks shall include manpower and cost estimates spread over time; and
 - g. All other procurements for work or support activities which the group is responsible for should be described, scheduled and costed in the MCP.
4. Documentation Plan - The Contractor shall use NPC 500-6 as a guide in preparing a documentation plan which recommends a documentation program. This plan shall include and describe the following: (R)

Documentation requirement list;

Documentation requirement descriptions;

Schedule of documentation submissions;

Documentation submission responsibilities;

Number of copies and distribution lists (supplied
by NASA);

Format and outline of each document;

Photograph requirements -

Still

Movie

Recommendations for alternate documentation submissions
and schedules.

The Contractor shall use his own internal documentation
to meet the above requirements to the maximum extent
feasible. The Contractor shall submit recommendations
regarding the NASA documentation requirements which
shall maximize the utility for the deliverable documents
for the Contractor's own internal use.

5. Make-or-Buy Plan - This plan shall include and describe
the following:

Make-or-Buy Criteria

Make-or-Buy Analysis

Capability Requirements

Cost Evaluation

Schedule Compatibility

Reports of Vendor Survey and Evaluation

Evaluation Criteria for Subcontract Proposals

Evaluation of all Subcontractor Proposals ®

6. Test Plan - Development of preliminary test plans covering the following minimum requirements:
 - a. Master test schedule in form of time - phased test flow charts and matrixes covering all equipment to be tested, type and level of testing, test facility and location.
 - b. Test concept/approach, and identification of major qualification or certification tests required.
 - c. Preliminary test specifications as part of the contract end item (CEI) specification which establishes the test requirements against the performance of design requirements in the Part I CEI specification (Use NPC-500-1 for format of preliminary specification and Annex D for general guidance). The subject specification will be referenced in the test plan.
 - d. Reference to detail lower level specifications and test procedures which will be prepared during Phase C.
7. Reliability and Quality Assurance Plans -
 - a. Development of preliminary R&QA program plans. (NPC 250-1, NPC 200-2 shall be used as a guide)
 - b. Development of preliminary mathematical model and reliability predictions. (NPC-250-1 shall be used as a guide)
 - c. Establishment of reliability and safety goals and other R&QA requirements in preliminary specifications. (NPC-500-1 shall be used as a guide)
 - d. Analysis of feasible alternatives and factors which could be major problems in achieving goals. (NPC-250-1 shall be used as a guide)
8. Specifications Plan - Development of Contract End Items Specifications Plan in accordance with Exhibits II, IV, V, and VI NPC 500-1 as applicable. A specifications "tree" which identifies the elements or subsystems of the Integrated Medical and Behavioral Laboratory Measurement System should be included.

1. Prepare a definitive statement of work and a cost proposal for Phase C following the guidelines presented herein. The statement of work shall be divided into the same organizational units as the Program Management Plans. This statement of work shall be considered a portion of the final report. One month prior to completion of Phase B, NASA will discuss the type of Phase C contract desired with the Contractor.

ARTICLE III. GOVERNMENT SUPPLIED INFORMATION FOR PHASE B STUDY

A. The titles of the twenty-three measurement packages and their associated individual measurements which must be accommodated by the measurement system are listed in Annexes A and B.

B. Apollo spacecraft systems capabilities, and constraints imposed by an Orbital Workshop are contained in Annex C.

ARTICLE IV. GUIDELINE INFORMATION REGARDING PHASE C, DESIGN

The following information is provided only as guideline information to assist the Contractor in preparing Phase C (Design Phase) work statement.

A. Objectives of Design Phase

1. Definition, design, fabrication and test of a prototype laboratory medical and behavioral measurement system which is capable of accommodating at least the specified measurements and which functions within the constraints of a refurbished Command Module, a Lunar Module or an Orbital Workshop, and within the operational constraints of AAP missions. It is anticipated that further detail and constraints for the potential carrier selection and replacement capability will be available in a timely manner so as to influence the Phase C design effort. The system will be capable of being packaged so that it may be transported into an Orbital Workshop by an astronaut wearing a pressurized space suit and working in zero g. The equipment shall be in modular form and the measurement systems shall be capable of enlargement or reduction in component equipment and shall be capable of being housed in any available AAP vehicle of necessary minimal size in such a manner that only changes in racking are required. Flexibility to easily and quickly accommodate changes in experiment and/or measurement content of AAP flights is one of the important considerations of this effort.
2. Completion of a set of Design Evaluation Drawings, Form 2, Drawings to Industry Standards (Partial Military Controls)

for each piece of flight equipment, subsystems, and total measurement system as specified by NASA in accordance with MIL-D-1000, 1 March 1965, and MIL-STD-100, 1 March 1965.

3. Completion of Program and Management Plans to accomplish Phase D, namely, the Development and Operations of an AAP Medical and Behavioral Laboratory Measurement System. These Program and Management Plans will be completed in the format and detail required for a Program Development Plan and a development phase effort as specified in the previously cited documents.
 4. Preparation of contract end item specifications in accordance with Exhibits II, IV, V, and VI NPC-500-1, as applicable.
 5. Preparation of requirement documents (e.g., contract end item specification) with due consideration to the guide-lines for the Preparation of AAP Experiment Contract End Item (CEI) Specification. (Annex D)
- B. Outline of Phase C (Design Phase) Contractor Tasks
1. Identify measurement requirements for Integrated Medical and Behavioral Measurement System from NASA supplied information.
 2. Define the measurement/spacecraft interface requirements. Spacecraft selected for the purpose of this study are the refurbished Command Module, the Lunar Module, and the Orbital Workshop.
 3. Define and design the measurement equipment modules and the data management system modules to operate within the environmental constraints of the selected spacecraft and within the mission parameters as identified by NASA. The data management system will be compatible with the spacecraft data management and telemetry system.
 4. Complete the required system engineering studies. The equipment modules and the total measurement systems shall be designed to optimize the use of common equipment and the organization and scheduling of flight crew experimental tasks for maximum efficiency of accomplishment and incorporation on-board the spacecraft.
 5. Develop and/or obtain operating measurement equipment and organize this equipment into a functional prototype measurement system. The system will be installed in a mock-up of either a refurbished Command Module, an ascent stage of a Lunar Module or a section of an Orbital Workshop. NASA will direct the Contractor regarding which vehicle mock-up shall be utilized.

6. Conduct equipment operating tests, time-line analysis testing in the NASA selected mock-up, and measurement feasibility analysis.
7. Develop Program and Management Plans for the conduct of the development and Operations Phase of the program.
 - a. These plans shall include the following and shall be organized in accordance with referenced documents:
 - Program Plan
 - Management Plan
 - Management Control Plans
 - Document Plan
 - Make-or-Buy Plan
 - Test Plan
 - Reliability and Quality Assurance Plan
 - Specifications Plan
 - Logistics Plan
8. Provide that at least two Contractor personnel be in residence at MSC for the duration of the contract. One member shall be a biomedical specialist and one a systems engineering specialist. These Contractor personnel will provide daily liaison with MSC technical monitors and will serve to establish a continuing liaison between MSC and the Contractor. Concurrence by NASA in the assignment of specific individuals to those residence positions is required.
9. Through NASA technical monitor, establish required liaison with Payload Integration Centers and NASA Principal Investigators.
10. Deliver to NASA the following:
 - a. Set of Design Evaluation Drawings, Form 2, Drawings to Industry Standards (Partial Military Controls) for each piece of flight equipment, subsystems,

and the total measurement system, as specified by NASA, in accordance with MIL-D-1000, 1 March 1965, and MIL-STD-100, 1 March 1965.

- b. Contract end item specifications in accordance with Exhibits II, IV, V, and VI NPC-500-1, as applicable.

- c. To Manned Spacecraft Center a functioning laboratory measurement system installed in a mock-up of one of the following configurations as will be specified by NASA:

A refurbished Command Module;

A LM Ascent-Stage; or

An Orbital Workshop Segment

The laboratory measurement system will be capable of being packaged in modular units, so that they can be transported into an Orbital Workshop. The carrying cases, properly identified, shall accompany the measurement system.

- d. Manuals which identify the following requirements:

Recommended procedures for the transport of the equipment modules into the Orbital Workshop and the mounting of the equipment in that spacecraft;

Training procedures for the operation and maintenance of the measurement system; and

Liaison with the Payload Integration Centers and their Contractors is required for the completion of this requirement.

- e. Fifty copies plus one (1) reproducible copy of a final report of the Design Phase effort.
- f. As part of the final report, a statement of work for the implementation of the development and operations phase of the program. The statement of work shall be divided into the same organizational units as the Program and Management proposals which shall be organized in the same fashion as the prime Contractor's proposal.

ARTICLE V. PERIOD OF PERFORMANCE

All work under this contract including preparation and submission of the final report and the conduct of the final oral briefing shall be accomplished within four (4) months from the effective date of this contract.

ARTICLE VI. REPORTING REQUIREMENTS

A. A letter report summarizing the Contractor's activities will be submitted to the Director, Medical Science and Technology, Space Medicine, Code MM, NASA Headquarters, Washington, D. C. 20546, one (1) month after contract initiation.

D. An interim progress report will be submitted to the Director, Medical Science and Technology, Space Medicine, Code MM, NASA Headquarters, Washington, D. C. 20546, two (2) months after contract initiation. A formal, oral briefing will be presented by the Contractor in Washington, D. C., within five (5) days following the submission of the interim report.

C. At least five (5) days prior to the expiration date of this contract, the Contractor shall submit thirty-five (35) copies plus one (1) reproducible copy of the final report to the Director, Medical Science and Technology, Space Medicine, Code MM, NASA Headquarters, Washington, D. C. 20546, and one (1) copy to the New Technology Representative, Technology Utilization Division, Code UP, Office of Technology Utilization, NASA Headquarters, Washington, D. C. 20546. Subsequent to the submission of the final report and prior to contract expiration, the Contractor shall conduct a formal, oral briefing on the study results in Washington, D.C.

D. Three Copies of all visual aid material to be utilized in the Contractor's oral briefings will be furnished to the Director, Medical Science and Technology, Space Medicine, Code MM, NASA Headquarters, Washington, D. C. 20546, at least five (5) days prior to the briefing sessions. The visual aid material shall be prepared on vu-graphs.

E. In addition to the above requirements, a copy of the letter of transmittal accompanying the final report shall be sent to the Headquarters Contracts Division, Code BCM-1, NASA Headquarters, Washington, D. C. 20546.

ARTICLE VII. KEY PERSONNEL AND FACILITIES

The personnel and/or facilities specified below are considered to be essential to the work being performed hereunder. Prior to diverting any of the specified individuals or facilities to other programs, the Contractor shall notify the Contracting Officer reasonably in advance and shall submit justification (including proposed substitutions) in sufficient detail to permit evaluation of the impact on the program. No diversion shall be made by the Contractor without the written consent of the Contracting Officer; provided, that the Contracting Officer may ratify in writing such diversion and such ratification shall constitute the consent of the Contracting Officer required by this article. The personnel and/or facilities specified below and in the case of personnel, the amount of time to be devoted by each key person, may, with the consent of the contracting parties, be amended from time to time during the course of this contract to either add or delete personnel and/or facilities and in the case of personnel the amount of time to be devoted by each key person. The following personnel and/or facilities are considered essential to the performance of this contract and the specified personnel shall devote approximately the amount of time shown to the performance of this contract:

(List of Personnel and/or
Facilities is to be drawn
from Contractor's Proposal -
This is negotiable)

ARTICLE VIII. TECHNICAL DIRECTION

As used hereunder, the meaning of technical direction is limited to directions to the Contractor which fill in details or otherwise complete the general description of work set forth by the contract schedule. This direction may not include new assignments of work, may not be of such a nature as to increase or decrease the price or period of performance, and may not affect any other provision of this contract. Work to be performed under this contract shall be subject to the technical direction of the following official or his designee: (R)

Director, Medical Science and Technology (Code MM)
National Aeronautics and Space Administration
Washington, D. C. 20546

ARTICLE IX. LIAISON

When determined to be necessary or advantageous in the performance of the work hereunder, the official designated as responsible for technical direction will arrange consultation regarding the work specified hereunder between responsible representatives of NASA and/or responsible representatives of other NASA contractors. All arrangements for such consultation shall require the approval of the official designated as responsible for technical direction.

ARTICLE X. INSPECTION AND ACCEPTANCE

Final inspection and acceptance of all work performed under this contract shall be by the official designated as responsible for technical direction or by his designee.

ARTICLE XI. CONSIDERATION AND PAYMENT

Upon completion and final approval and acceptance of the work called for herein, the Contractor shall be paid the sum of \$ _____.

ARTICLE XII. SCIENTIFIC AND TECHNICAL INFORMATION SERVICE

A. In order that NASA may provide the Contractor scientific and technical information in accordance with the procedures set forth in the introduction section of Scientific and Technical Aerospace Reports (STAR) distributed by NASA, the Contractor shall, within 10 days after receipt of this contract, furnish in writing to the Scientific and Technical Information Division (Code US), NASA Headquarters, Washington, D. C. 20546, (i) name of Contractor, (ii) contract number, (iii) date of contract completion, (iv) security classification of contract, and (v) name and address of the individual responsible for technical performance of the contract.

B. NASA reserves the right, in the event of the unavailability of any scientific and technical information requested, to notify the Contractor of such unavailability. Failure of NASA to furnish any information requested shall not entitle the Contractor to any adjustment in the price, cost (estimated or target), fee time required for performance or delivery schedule of the contract.

ANNEX A

MEASUREMENT IDENTIFICATION

NASA MEASUREMENT NUMBER

MEASUREMENT TITLE

0101	Linear Acceleration Effect Upon Otolith in Weightlessness
0102	Rotary Acceleration Effect Upon Semi-Circular Functions in Weightlessness
0103	Response of Circulatory Dynamics to Provocative Stimuli in Space Flight
0104	Work Capacity and Circulatory Responses During Prolonged Space Flight
0105	Changes in Blood Volume and Other Body Fluid Compartment Volumes Resulting from Prolonged Weightlessness
0106	Effect of Prolonged Space Flight Upon Carotid Baroreceptor Reflexes and Arteriolar Reactivity
0107	Changes in Venous Compliance Caused by Zero Hydrostatic Pressure
0108	Circulatory-Reflex-Change Countermeasure Effectiveness in Prolonged Weightlessness
0109	Assessment of Prolonged Space Flight Upon Pulmonary Function
0110	Determination of Effects of Prolonged Space Flight Upon Ventilatory Gas Change
0111	Evaluation of Muscle Mass and Strength Related to Confinement and Weightlessness
0112	Study of Mineral Metabolism in Man During Prolonged Space Flight
0113	Assessment of Nutritional Status of Man During Prolonged Space Flight
0114	Gastrointestinal Motility and pH
0115	Study of Thermal Regulation in Man During Prolonged Space Flight
0117	Neuro-Endocrine-Function Reaction to Prolonged Space Flight

MEASUREMENT IDENTIFICATION
(CONTINUED)

NASA MEASUREMENT NUMBER

MEASUREMENT TITLE

0118	Dynamics of Human Hemic Cell Proliferation, Distribution, and Destruction in Prolonged Space Flight
0119	Human Hematological Defenses in Prolonged Space Flight
0120	Hemostasis
0121	Microbiological Evaluation (Nose, Mouth, Throat, Skin and Gastrointestinal Tract)
0201	Astronaut In-Flight Performance (Sensory and Perceptual Processes)
0202	Astronaut In-Flight Performance (Psychomotor Functioning)
0203	Astronaut In-Flight Performance (Higher Mental Processes)

ANNEX B

NEUROLOGICAL

ITEM

CLINICAL NEUROLOGICAL EVALUATION (Hx FORM AND Px)

OTOLITH EVALUATION

- a. OCULAR COUNTER-ROLLING (IN-FLIGHT)
- b. OCULOGRAVIC ILLUSION
- c. THRESHOLD OF LINEAR ACCELERATIONS TO HEAD

SEMICIRCULAR CANAL EVALUATION

- a. OCULOCYRIC ILLUSION
- b. VISUAL TASK PERFORMANCE WITH HEAD ROTATION
- c. NYSTAGMOGRAM (EOG)
- d. EYE MOVEMENT CINEMATOGRAPHY (FIBER OPTICS BUNDLE)

HUMAN OTOLITH FUNCTION (M-9)

CEREBRAL ELECTRICAL ACTIVITY (EEG)

®

CARDIOVASCULAR

ITEM

CLINICAL CARDIOVASCULAR EVALUATION (Hx FORM AND Px)

CARDIAC DYNAMICS EVALUATION

- a. ELECTROCARDIOGRAM
- b. PHONOELECTROCARDIOGRAM (M-4)
- c. BALLISTOCARDIOGRAM
- d. CARDIAC OUTPUT (NON-INVASIVE)
- e. THORACIC BLOOD FLOW

HEMODYNAMICS EVALUATION

- a. BLOOD PRESSURE MEASUREMENT
- b. CENTRAL AND PERIPHERAL VENOUS PRESSURE
- c. VENOUS COMPLIANCE
- d. REGIONAL BLOOD FLOW
- e. ARTERIOLAR REACTIVITY
- f. PULSE CONTOUR

FLUID VOLUME DISTRIBUTION EVALUATION

- a. BODY FLUID DISTRIBUTION
- b. URINARY CATECHOLAMINES, ADRENAL STEROIDS, ADH (SEE ENDOCRINE)
- c. FLUID AND ELECTROLYTE BALANCE (SEE METABOLIC AND NUTRITIONAL)

CARDIOVASCULAR (CONTINUED)

THE FOLLOWING PROVOCATIVE TESTING AND COUNTERMEASURE TECHNIQUES WILL BE UTILIZED WHERE INDICATED AND APPLICABLE:

ITEM

PROVOCATIVE TESTING:

TILT TABLE RESPONSE (PRE- AND POST-FLIGHT)
FITNESS EVALUATION (PRE- AND POST-FLIGHT)
RESPONSE TO THERMAL CHANGE (ORTHOSTATIC TOLERANCE AND CUTANEOUS BLOOD FLOW)
RESPONSE TO CAROTID BODY STIMULATION (PROVOCATIVE AND REMEDIAL)
RESPONSE TO IN-FLIGHT EXERCISE (PROVOCATIVE AND REMEDIAL)
RESPONSE TO LBNP IN FLIGHT (PROVOCATIVE AND REMEDIAL)

COUNTERMEASURES:

RESPONSE TO OCCLUSIVE CUFFS (M-1)
RESPONSE TO ANTI-G SUIT PRE-REENTRY
RESPONSE TO ELASTIC LEOTARD PRE-REENTRY

RESPIRATORY

ITEM

CLINICAL RESPIRATORY EVALUATION (Hx FORM AND Px)

INVESTIGATION OF POSSIBLE CHANGES DUE TO

- a. WEIGHTLESSNESS
- b. ABNORMAL RESPIRATORY ENVIRONMENT
- c. PROLONGED INACTIVITY

MECHANICS OF VENTILATION EVALUATION

- a. LUNG CAPACITIES
- b. GAS FLOW RATE
- c. PRESSURE FLOW AND VOLUME

PULMONARY GAS EXCHANGE EVALUATION

- a. DIFFUSION
- b. DISTRIBUTION OF BLOOD FLOW AND GAS IN LUNG
- c. O₂ AND CO₂ IN INSPIRED AND EXPIRED AIR (BREATH BY BREATH),
AND ARTERIAL BLOOD

FITNESS EVALUATION PRE AND POST FLIGHT (SEE CARDIOVASCULAR)

METABOLIC AND NUTRITIONAL

ITEM

CLINICAL METABOLIC AND NUTRITIONAL EVALUATION (Hx FORM AND Px)

MUSCULAR STATUS EVALUATION

- a. MEASUREMENT OF MUSCLE SIZE, STRENGTH, EFFICIENCY AND FUNCTION (BLOOD LACTIC ACID, URINARY CREATININE AND CREATINE, ELECTROMYOGRAPHY)

MINERAL METABOLISM AND SKELETAL STATUS EVALUATION

- a. MINERAL BALANCE (INCLUDING URINE ANALYSIS FOR FACTORS AFFECTING STONE FORMATION; AND HYDROXYPROLINE)
- b. DYNAMICS OF MINERAL METABOLISM (ISOTOPES)
- c. IN-FLIGHT BONE DENSITY
- d. PRE- AND POST-FLIGHT DENSITOMETRY (M-6)

GENERAL METABOLISM AND NUTRITION EVALUATION

- a. ENERGY METABOLISM AT VARIOUS LEVELS OF ACTIVITY (O₂ CONSUMPTION, CO₂ PRODUCTION, CALORIC INTAKE, SERUM LIPIDS, DYNAMIC CARBOHYDRATE STUDIES)
 - b. DETERMINATION OF LEAN BODY MASS (BODY MASS AND BODY VOLUME)
 - c. MEASUREMENT OF ACID BASE METABOLISM (SEE RESPIRATORY)
 - d. MEASUREMENT OF PROTEIN METABOLISM (SERUM PROTEINS WITH ELECTROPHORESIS, NPN, BUN, BLOOD, URIC ACID)
 - e. FLUID BALANCE
 - f. BODY FLUID DISTRIBUTION (SEE CARDIOVASCULAR)
 - g. STANDARD CLINICAL URINALYSIS (IN-FLIGHT)
- ®

METABOLIC AND NUTRITIONAL (CONTINUED)

ITEM

GASTROINTESTINAL ACTIVITY EVALUATION

- a. EFFECTS OF ZERO G ON INTESTINAL FLORA, GASTRIC MOTILITY, pH AND ABSORPTION
- b. GASTROINTESTINAL CYTOLOGY

*THERMAL REGULATION EVALUATION

- a. MEASUREMENT OF CORE AND SKIN TEMPERATURES
- b. COMFORT INDEX FOR VARYING THERMAL LOADS
- c. CARDIOVASCULAR RESPONSE TO THERMAL CHANGE (ORTHOSTATIC TOLERANCE AND CUTANEOUS BLOOD FLOW) (SEE CARDIOVASCULAR)

*EFFECTS OF THERMAL CHANGE ON ENERGY METABOLISM, FLUID AND ELECTROLYTE BALANCE, AND OTHER MEASUREMENTS ALSO TO BE ASSESSED.

ENDOCRINE*+

ITEM

CLINICAL ENDOCRINE EVALUATION (Hx FORM AND Px)

MEASUREMENT OF PITUITARY ACTIVITY (CIRCULATING ACTH;
URINARY ADH AND SPECIFIC GRAVITY)

MEASUREMENT OF THYROID ACTIVITY (PBI: TBPA)

MEASUREMENT OF PARATHYROID ACTIVITY (CIRCULATING PARATHORMONE)

MEASUREMENT OF ADRENAL CORTICAL ACTIVITY (URINARY 17 OHCS,
17 KETOSTEROIDS, AND ALDOSTERONE)

MEASUREMENT OF GONADAL ACTIVITY (PRE- AND POST-FLIGHT GERM CELL
EXAMINATION)

MEASUREMENT OF NEURO-HUMERAL ACTIVITY (URINARY CATECHOLAMINES
AND SEROTONIN)

MEASUREMENT OF PANCREATIC ISLET TISSUE (SEE METABOLIC AND
NUTRITIONAL)

*The majority of A/A medical measurements and techniques described,
particularly under "Metabolic and Nutritional" are applicable to
the evaluation of endocrine function. They are too numerous to be
listed here.

+Assays to be done in earth-based laboratories on specimens collected
and stored in flight.

HEMATOLOGICAL

ITEM

CLINICAL EVALUATION (Hx FORM AND Px)

CHANGES IN CELLULAR KINETICS AND STRUCTURE EVALUATION

- a. DYNAMIC MEASUREMENT OF HEMIC CELLS (BLOOD CELL COUNTS AND MORPHOLOGY)
- b. RBC SURVIVAL (ISOTOPE TAGGED RBCs; RBC FAGILITY; DIRECT BILIRUBIN; M-22)
- c. CYTOGENETIC STUDIES (LYMPHOCYTE KARYOTYPING; M-11)

CELLULAR BODY DEFENSES

- a. LEUKOCYTE MOBILITY (PHAGOCYTOSIS)
- b. LEUKOCYTE MOBILIZATION

HEMOSTASIS

- a. PLATELET FUNCTIONS
- b. HUMERAL COMPONENTS OF COAGULATION
- c. VASCULAR EFFECTS
- d. (EVALUATION OF HEMOSTATIC MECHANISMS (BLEEDING AND COAGULATION TIMES; ASSAY OF ELEMENTS OF CLOTTING)

BLOOD RHEOLOGY (FLOW PROPERTIES OF THE BLOOD)

MICROBIOLOGICAL AND IMMUNOLOGICAL

ITEM

CLINICAL EXAMINATION (Hx FORM AND Px)

ASSESSMENT OF CHANGES IN MICROBIOLOGICAL ECOLOGY
AMONG FLIGHT CREW MEMBERS (CULTURES OF NOSE, THROAT,
GI TRACT, SKIN, COUGH PLATES, CULTURES OF CABIN AND
SUIT ECS)

IMMUNOLOGICAL EVALUATION (GLOBULIN ELECTROPHORESIS,
ANTIBODY TITRATION, MEASUREMENT OF COMPLEMENT)

ESTABLISHMENT OF SERUM AND PLASMA BANK (ON ASTRONAUT
POPULATION)

®

BEHAVIORAL

ITEM

PSYCHIATRIC INTERVIEW FORM

SENSORY-PERCEPTUAL PROCESSES

- a. VISUAL FUNCTION (ACUITY, DEPTH PERCEPTION, PHORIAS, PATTERNS, READING)
- b. AUDITORY FUNCTION (PITCH, INTENSITY, LOCALIZATION, PATTERNS, MOTION, SPEECH)
- c. KINESTHETIC FUNCTION (POSITIONAL, DYNAMIC)
- d. VESTIBULAR FUNCTION (LINEAR, ANGULAR) (SEE NEUROLOGICAL)
- e. ORIENTATION ABILITY (TEMPORAL, POSITIONAL, LOCATION)

PSYCHOMOTOR FUNCTIONING

- a. FINE MOTOR MOVEMENT (MANIPULATION, DEXTERITY, POSITIONING, STEADINESS)
- b. GROSS MOTOR MOVEMENT (LOCOMOTION, DEXTERITY)
- c. CONTINUOUS PROCESSES (PURSUIT AND COMPENSATORY TRACKING - MOTOR AND COGNITIVE)
- d. DISCRETE PROCESSES (SIMPLE AND COMPLEX REACTION - MOTOR AND COGNITIVE)

- (INVESTIGATE THE POSSIBILITY OF MAKING MEASUREMENTS IN THIS AREA BY OBSERVATIONS OF ASTRONAUT ACTIVITY, IN-FLIGHT CONTROL AND EXPERIMENTAL TASKS)

ANNEX D

GUIDELINES FOR THE PREPARATION OF AAP EXPERIMENT CONTRACT END ITEM (CEI) SPECIFICATION

I. Philosophy and Criteria:

The specification shall be prepared with maximum consideration of performance, cost and schedule effectiveness. To meet this philosophy the following criteria shall be used in establishing performance, design, test and associated documentation requirements.

A. Criteria Applicable in Defining Performance, Design and Test Requirements.

1. Use existing resources. Maximum use shall be made of available resources, (e.g., Apollo, Gemini/other Government facilities, equipments, procedures, data and personnel).
2. Apply AAP hardware criticality categories. Performance, design and testing requirements shall be established in accordance with AAP hardware criticality categories:

CAT 1 - Hardware, the failure of which could affect crew safety

CAT 2 - Hardware, the failure of which would result in not meeting the primary objective of the mission

CAT 3 - Hardware which does not fall into the above two categories

Experiment and AAP peculiar hardware criticality categories shall be identified by cognizant AAP Program Manager, consistent with the AAP mission directives. The performance, design and test specification or requirements established should be most stringent for CAT 1 and 2 hardware and less stringent for CAT 3 hardware. (It should be recognized that hardware, the failure of which results in failure to achieve a secondary mission objective, is categorized as CAT 3.)

3. Prepare a specification for each end item or each system which contains many end items of hardware.
 - a. Each specification shall contain the following two major sections:
 - (1) Performance and design requirements (including interface requirements);
 - (2) Test requirements/quality assurance (against (1) above).

- b. The program, project and CEI specifications shall be in accordance, as applicable, with Exhibits I through VI of Configuration Management Manual (NPC 500-1) on an added, deleted and modified basis and constrained by the requirements specified herein. Simplified formats as described in Exhibits III and IV shall be used where practical.
4. Maximize equipment standardization. Common equipment shall be designed for multiple use where practical. Qualified Apollo and other space program parts, assemblies or subsystems shall be used. Modular add-on shall be designed to the maximum extent possible, consistent with trade-off studies. Mission and/or program optimization shall be considered by grouping related experiments or new hardware into a single item of hardware whenever possible.
 5. Simplify hardware interfaces. Experiment hardware shall be designed to minimize physical and functional interfaces with the carrier hardware.
 6. Minimize crew time. Hardware shall be designed to minimize crew training and crew time requirements, consistent with crew safety and achieving mission primary objectives.
 7. Define a system or element of a system thru Systems Engineering Analysis. Such analysis includes translating objectives of a system or its elements into contract end item requirements (specification) by defining functions and their relationships (or flow diagrams), synthesizing alternate approaches, optimizing trade-off approaches and identifying the selected approach in terms of equipment, facilities, personnel and data as required.
 8. Conduct trade-off studies in terms of performance/cost/schedule effectiveness for all major decisions. Weighted factors shall be established for performance, cost, and schedule by the cognizant management within its area of responsibility.
 9. Select the proper factors of safety. Such factors shall be specified for all hardware in the Part I CEI Specification, within the constraints of performance and weight. The conservative application of safety factors, derating factors and design margins will permit design verification by analysis techniques, and will contribute to reducing the cost of testing and quality assurance.
 10. Identify minimum requirements from NASA documents, (e.g., NPC 250-1, NPC 200-2). It is undesirable to specify an entire document on contract unless the entire document is applicable. Only the applicable paragraph or its modification shall be specified.
 11. Review to maintain realistic requirements. Continuous reviews shall be conducted (a) to update performance and test requirements and equipment schedules as a result of knowledge gained from earlier activities or flights.

B. Criteria Applicable in Defining Test Requirements.

1. Where practical, conduct testing at highest hardware generation level with minimum piece part testing.
2. Conduct complete acceptance testing at the origin, (e.g., complete experiment hardware acceptance at the experiment manufacturing site to reduce duplicate testing and required resources at the payload integration site).
3. Avoid requalification of experiment hardware (e.g., qualified Apollo hardware will not be requalified for AAP if both requirements are the same or comparable.
4. Accomplish where practical qualification and delta qualification by analysis and supplement tests only if analysis predicted on other program qualification tests is not considered adequate as full qualification.
5. Prepare the test specification against the performance/design requirement for each item of hardware. The test requirement or specification, which is part of the CEI Specification (paragraph I.A.3), shall be prepared in terms of the type of test (development, qualification, integrated systems, etc.), to demonstrate that performance/design requirements are to be met. Apollo Test Requirements Document (NPC 500-10) should be used as a baseline for identifying test requirements. Verification matrices of test requirements against each performance/design requirement should be included in the CEI Specification.
6. Utilization of ground test hardware as flight or backup hardware. Experiment hardware which has been subjected to environmental qualification tests may be utilized as flight or backup hardware provided that:
 - a. Crew safety is not compromised; and
 - b. The hardware is refurbished to meet CEI performance and test specification by replacement of components whose performance may have been degraded by the environmental test.
7. Implement and test feed back system. An effective system should be established and implemented to insure that ground and flight test results are analyzed and fed back into the design and test planning for action.

C. Documentation:

Minimize Documentation: Minimum documentation and data requirements consistent with absolute need and cost effectiveness shall be specified. This is especially for hardware which falls in CAT 3. Contractor delivered documents should be emphasized on end product oriented data rather than in-process development data. All documentation shall be identified in a document requirement list (DRL NASA Form 1106), and document requirement description (DRD, NASA Form 1107) to be approved by the cognizant center. The Apollo Documentation Administration Instructions, NPC 500-6, may be used as a guide for identifying,

selecting, acquiring, controlling and scheduling of minimum essential documents. Administrative policy on requirements and responsibility for experiment data storage and distribution shall be determined by NASA Headquarters. The contractor internal working paper shall be employed as program working paper where practical. The DRL should identify the following categories of documents:

- I - Documents submitted to NASA for approval and retention
- II - Documents submitted to NASA when requested

II. Source Documents:

The following additional listed documents may be used as source documents to satisfy the requirements specified in these guidelines. Where requirements in these source documents conflict with the guidelines, the guidelines shall take precedence.

<u>TITLE</u>	<u>DOCUMENT NO.</u>
Saturn/Apollo Applications Program Technical Summary (for planning purposes only, OMSF, Sept 1, 1966)	(No number)
Experimenter Design Guide (Design envelope info on CSM/LM Lab for alternate missions. For planning purposes only)	(SID 65-1536 & Design 378B)
Orbital Workshop, Manned Spacecraft Center, Experiments Requirements	NASA Working Paper No. 10,065
Systems Engineering Management Procedures (guide only)	AFSCM 375-5
Natural Environment and Physical Standards for Apollo Program	MD-E 8020-008B

GENERAL PROVISIONS (Fixed-Price Research and Development Contract)

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1. DEFINITIONS (September 1962)

As used throughout this contract, the following terms shall have the meanings set forth below:

(a) The term "Administrator" means the Administrator or Deputy Administrator of the National Aeronautics and Space Administration; and the term "his duly authorized representative" means any person or persons or board (other than the Contracting Officer) authorized to act for the Administrator.

(b) The term "Contracting Officer" means the person executing this contract on behalf of the Government, and any other officer or civilian employee who is a properly designated Contracting Officer; and the term includes, except as otherwise provided in this contract, the authorized representative of a Contracting Officer acting within the limits of his authority.

(c) Except as otherwise provided in this contract, the term "subcontracts" includes purchase orders under this contract.

(d) The term "NASA" means the National Aeronautics and Space Administration.

2. PAYMENTS (September 1962)

The Contractor shall be paid, upon submission of proper invoices or vouchers, the prices stipulated herein for work delivered or rendered and accepted, less deductions, if any, as herein provided. Unless otherwise specified, payment will be made upon acceptance of any portion of the work delivered or rendered for which a price is separately stated in the contract.

3. STANDARDS OF WORK (September 1962)

The Contractor agrees that the performance of work and services pursuant to the requirements of this contract shall conform to high professional standards.

4. INSPECTION (September 1962)

The Government, through any authorized representatives, has the right, at all reasonable times, to inspect, or otherwise evaluate the work performed or being performed hereunder and the premises in which it is being performed. If any inspection or evaluation is made by the Government on the premises of the Contractor or a subcontractor, the Contractor shall provide and shall require subcontractors to provide all reasonable facilities and assistance for the safety and convenience of the Government representatives in the performance of their duties. All inspections and evaluations shall be performed in such a manner as will not unduly delay the work.

5. ASSIGNMENT OF CLAIMS (September 1962)

(a) Pursuant to the provisions of the Assignment of Claims Act of 1940, as amended (31 U.S.C. 203, 41 U.S.C. 15), if this contract provides for payments aggregating \$1,000 or more, claims for moneys due or to become due the Contractor from the

Government under this contract may be assigned to a bank, trust company, or other financing institution, including any Federal lending agency, and may thereafter be further assigned and reassigned to any such institution. Any such assignment or reassignment shall cover all amounts payable under this contract and not already paid, and shall not be made to more than one party, except that any such assignment or reassignment may be made to one party as agent or trustee for two or more parties participating in such financing. Unless otherwise provided in this contract, payments to an assignee of any moneys due or to become due under this contract shall not, to the extent provided in said Act, as amended, be subject to reduction or setoff. (The preceding sentence applies only if this contract is made in time of war or national emergency as defined in said Act and is with the Department of Defense, the General Services Administration, the Atomic Energy Commission, the National Aeronautics and Space Administration, the Federal Aviation Agency, or any other department or agency of the United States designated by the President pursuant to Clause 4 of the proviso of section 1 of the Assignment of Claims Act of 1940, as amended by the Act of May 15, 1951, 65 Stat. 41.)

(b) In no event shall copies of this contract or of any plans, specifications, or other similar documents relating to work under this contract, if marked "Top Secret," "Secret," or "Confidential," be furnished to any assignee of any claim arising under this contract or to any other person not entitled to receive the same. However, a copy of any part or all of this contract so marked may be furnished, or any information contained therein may be disclosed, to such assignee upon the prior written authorization of the Contracting Officer.

6. EXAMINATION OF RECORDS (September 1962)

(a) The Contractor agrees that the Comptroller General, of the United States or any of his duly authorized representatives shall, until the expiration of three (3) years after final payment under this contract, have access to and the right to examine any directly pertinent books, documents, papers, and records of the Contractor involving transactions related to this contract.

(b) The Contractor further agrees to include in all his subcontracts hereunder a provision to the effect that the subcontractor agrees that the Comptroller General of the United States or any of his duly authorized representatives shall, until the expiration of three (3) years after final payment under the subcontract, have access to and the right to examine any directly pertinent books, documents, papers, and records of such subcontractor involving transactions related to the subcontract. The term "subcontract" as used in this clause excludes (i) purchase orders not exceeding \$2,500, and (ii) subcontracts or purchase orders for public utility services at rates established for uniform applicability to the general public.

7. FEDERAL, STATE, AND LOCAL TAXES (November 1964)

(a) Except as may be otherwise provided in this contract, the contract price includes all applicable Federal, State, and local taxes and duties.

(b) Nevertheless, with respect to any Federal excise tax or duty on the transactions or property covered by this contract, if a statute, court decision, written ruling, or regulation takes effect after the contract date, and—

(1) Results in the Contractor being required to pay or bear the burden of any such Federal excise tax or duty or increase in the rate thereof which would not otherwise have been payable on such transactions or property, the contract price shall be increased by the amount of such tax or duty or rate increase: *provided*, that the Contractor, if requested by the Contracting Officer, warrants in writing that no amount for such newly imposed Federal excise tax or duty or rate increase was included in the contract price as a contingency reserve or otherwise; or

(2) Results in the Contractor not being required to pay or bear the burden of, or in his obtaining a refund or drawback of, any such Federal excise tax or duty which would otherwise have been payable on such transactions or property or which was the basis of an increase in the contract price, the contract price shall be decreased by the amount of the relief, refund, or drawback, or that amount shall be paid to the Government, as directed by the Contracting Officer. The contract price shall be similarly decreased if the Contractor, through his fault or negligence or his failure to follow instructions of the Contracting Officer, is required to pay or bear the burden of, or does not obtain a refund or drawback of, any such Federal excise tax or duty.

(c) No adjustment pursuant to paragraph (b) above will be made under this contract unless the aggregate amount thereof is or may reasonably be expected to be over \$100.

(d) As used in paragraph (b) above, the term "contract date" means the date set for the bid opening, or if this is a negotiated contract, the date of this contract. As to additional supplies or services procured by modification to this contract, the term "contract date" means the date of such modification.

(e) Unless there does not exist any reasonable basis to sustain an exemption, the Government, upon request of the Contractor, without further liability, agrees, except as otherwise provided in this contract, to furnish evidence appropriate to establish exemption from any tax which the Contractor warrants in writing was excluded from the contract price. In addition, the Contracting Officer may furnish evidence to establish exemption from any tax that may, pursuant to this clause, give rise to either an increase or decrease in the contract price. Except as otherwise provided in this contract, evidence appropriate to establish exemption from duties will be furnished only at the direction of the Contracting Officer.

(f) The Contractor shall promptly notify the Contracting Officer of matters which will result in either an increase or decrease in the contract price, and shall take action with respect thereto as directed by the Contracting Officer.

8. UTILIZATION OF SMALL BUSINESS CONCERNS (July 1962)

(a) It is the policy of the Government as declared by the Congress that a fair proportion of the purchases and contracts for supplies and services for the Government be placed with small business concerns.

(b) The Contractor agrees to accomplish the maximum amount of subcontracting to small business concerns that the Contractor finds to be consistent with the efficient performance of this contract.

9. DEFAULT (November 1964)

(a) The Government may, subject to the provisions of paragraph (c) of this clause, by written Notice of Default to the Contractor terminate the whole or any part of this contract in any one of the following circumstances:

(i) if the Contractor fails to perform the work called for by this contract within the time(s) specified herein or any extension thereof; or

(ii) if the Contractor fails to perform any of the other provisions of this contract, or so fails to prosecute the work as to endanger performance of this contract in accordance with its terms, and in either of these two circumstances does not cure such failure within a period of 10 days (or such longer period as the Contracting Officer may authorize in writing) after receipt of notice from the Contracting Officer specifying such failure.

(b) In the event the Government terminates this contract in whole or in part as provided in paragraph (a) of this clause, the Government may procure, upon such terms and in such manner as the Contracting Officer may deem appropriate, work similar to the work so terminated and the Contractor shall be liable to the Government for any excess costs for such similar work; *provided*, that the Contractor shall continue the performance of this contract to the extent not terminated under the provisions of this clause.

(c) Except with respect to defaults of subcontractor, the Contractor shall not be liable for any excess costs if the failure to perform the contract arises out of causes beyond the control and without the fault or negligence of the Contractor. Such causes may include, but are not restricted to, acts of God or of the public enemy, acts of the Government in either its sovereign or contractual capacity, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and unusually severe weather; but in every case the failure to perform must be beyond the control and without the fault or negligence of the Contractor. If the failure to perform is caused by the default of a subcontractor, and if such default arises out of causes beyond the control of both the Contractor and subcontractor, and without the fault or negligence of either of them, the Contractor shall not be liable for any excess costs for failure to perform, unless the supplies or service to be furnished by the subcontractor were obtainable from other sources in sufficient time to permit the Contractor to meet the required delivery schedule or other performance requirements.

(d) If this contract is terminated as provided in paragraph (a) of this clause, the Government, in addition to any other rights provided in this clause, may require the Contractor to transfer title and deliver to the Government, in the manner and to the extent directed by the Contracting Officer any of the completed or partially completed work not theretofore delivered to, and accepted by, the Government and any other property, including contract rights, specifically produced or specifically acquired for the performance of such part of this contract as has been terminated; and the Contractor shall, upon the direction of the Contracting Officer, protect and preserve property in the possession of the Contractor in which the Government has an interest. The Government shall pay to the Contractor the contract price, if separately stated, for completed work accepted by the Government and the amount agreed upon by the Contractor and the Contracting Officer for (i) completed work for which no separate price is stated, (ii) partially completed work, (iii) other property described above which is accepted by the Government, and (iv) the protection and preservation of property. Failure to agree shall be a dispute concerning a question of fact within the meaning of the clause of this contract entitled "Disputes." The Government may withhold from amounts otherwise due the Contractor for such completed supplies or manufacturing materials such sum as the Contracting Officer determines to be necessary to protect the Government against loss because of outstanding liens or claims of former lien holders.

(e) If, after notice of termination of this contract under the provisions of this clause, it is determined for any reason that the Contractor was not in default under the provisions of this clause, or that the default was excusable under the provisions of this clause, the rights and obligations of the parties shall, if the contract contains a clause providing for termination for convenience of the Government, be the same as if the notice of termination had been issued pursuant to such clause. If, after notice of termination of this contract under the provisions of this clause, it is determined for any reason that the Contractor was not in default under the provisions of this clause, and if this contract does not contain a clause providing for termination for convenience of the Government, the contract shall be equitably adjusted to compensate for such termination and the contract modified accordingly; failure to agree to any such adjustment shall be a dispute concerning a question of fact within the meaning of the clause of this contract entitled "Disputes."

(f) The rights and remedies of the Government provided in this clause shall not be exclusive and are in addition to any other rights and remedies provided by law or under this contract.

10. TERMINATION FOR CONVENIENCE OF THE GOVERNMENT (January 1964)

(a) The performance of work under this contract may be terminated by the Government in accordance with this clause in whole, or from time to time in part, whenever the Contracting Officer shall determine that such termination is in the best inter-

est of the Government. Any such termination shall be effected by delivery to the Contractor of a Notice of Termination specifying the extent to which performance of work under the contract is terminated, and the date upon which such termination becomes effective.

(b) After receipt of a Notice of Termination, and except as otherwise directed by the Contracting Officer, the Contractor shall:

(i) stop work under the contract on the date and to the extent specified in the Notice of Termination;

(ii) place no further orders or subcontracts for materials, services, or facilities, except as may be necessary for completion of such portion of the work under the contract as is not terminated;

(iii) terminate all orders and subcontracts to the extent that they relate to the performance of work terminated by the Notice of Termination;

(iv) assign to the Government, in the manner, at the times, and to the extent directed by the Contracting Officer, all of the right, title, and interest of the Contractor under the orders and subcontracts so terminated, in which case the Government shall have the right, in its discretion, to settle or pay any or all claims arising out of the termination of such orders and subcontracts;

(v) settle all outstanding liabilities and all claims arising out of such termination of orders and subcontracts, with the approval or ratification of the Contracting Officer, to the extent he may require, which approval or ratification shall be final for all the purposes of this clause;

(vi) transfer title and deliver to the Government, in the manner, at the times, and to the extent, if any, directed by the Contracting Officer, (A) the fabricated or unfabricated parts, work in process, completed work, supplies, and other material produced as a part of, or acquired in connection with the performance of, the work terminated by the Notice of Termination, and (B) the completed or partially completed plans, drawings, information, and other property which, if the contract had been completed, would have been required to be furnished to the Government;

(vii) use his best efforts to sell, in the manner, at the times, to the extent, and at the price or prices directed or authorized by the Contracting Officer, any property of the types referred to in (vi) above; *provided*, however, that the Contractor (A) shall not be required to extend credit to any purchaser, and (B) may acquire any such property under the conditions prescribed by and at a price or prices approved by the Contracting Officer; and *provided further* that the proceeds of any such transfer or disposition shall be applied in reduction of any payments to be made by the Government to the Contractor under this contract or shall otherwise be credited to the price or cost of the work covered by this contract or paid in such other manner as the Contracting Officer may direct;

(viii) complete performance of such part of the work as shall not have been terminated by the Notice of Termination; and

(ix) take such action as may be necessary, or as the Contracting Officer may direct, for the protection and preservation of the property related to this contract which is in the possession of the Contractor and in which the Government has or may acquire an interest.

At any time after expiration of the plant clearance period, as defined in Part 8, NASA Procurement Regulation as it may be amended from time to time, the Contractor may submit to the Contracting Officer a list, certified as to quantity and quality, of any or all items of termination inventory not previously disposed of, exclusive of items the disposition of which has been directed or authorized by the Contracting Officer, and may request the Government to remove such items or enter into a storage agreement covering them. Not later than fifteen (15) days thereafter, the Government will accept title to such items and remove them or enter into a storage agreement covering the same; *provided*, that the list submitted shall be subject to verification by the Contracting Officer upon removal of the items, or, if the items are stored, within forty-five (45) days from the date of submission of the list, and any necessary adjustment to correct the list as submitted shall be made prior to final settlement.

(c) After receipt of a Notice of Termination, the Contractor shall submit to the Contracting Officer his termination claim, in the form and with certification prescribed by the Contracting Officer. Such claim shall be submitted promptly but in no event later than one (1) year from the effective date of termination, unless one or more extensions in writing are granted by the Con-

tracting Officer, upon request of the Contractor made in writing within such one (1) year period or authorized extension thereof. However, if the Contracting Officer determines that the facts justify such action, he may receive and act upon any such termination claim at any time after such one (1) year period or any extension thereof. Upon failure of the Contractor to submit his termination claim within the time allowed, the Contracting Officer may, subject to any Settlement Review Board approvals required by NASA Regulations in effect as of the date of execution of this contract, determine, on the basis of information available to him, the amount, if any, due to the Contractor by reason of the termination and shall thereupon pay to the Contractor the amount so determined.

(d) Subject to the provisions of paragraph (c), and subject to any Settlement Review Board approvals required by NASA Regulations in effect as of the date of execution of this contract, the Contractor and the Contracting Officer may agree upon the whole or any part of the amount or amounts to be paid to the Contractor by reason of the total or partial termination of work pursuant to this clause, which amount or amounts may include a reasonable allowance for profit on work done; *provided*, that such agreed amount or amounts, exclusive of settlement costs, shall not exceed the total contract price as reduced by the amount of payments otherwise made and as further reduced by the contract price of work not terminated. The contract shall be amended accordingly, and the Contractor shall be paid the agreed amount. Nothing in paragraph (e) of this clause, prescribing the amount to be paid to the Contractor in the event of failure of the Contractor and the Contracting Officer to agree upon the whole amount to be paid to the Contractor by reason of the termination of work pursuant to this clause, shall be deemed to limit, restrict, or otherwise determine or affect the amount or amounts which may be agreed upon to be paid to the Contractor pursuant to this paragraph (d).

(e) In the event of the failure of the Contractor and the Contracting Officer to agree as provided in paragraph (d) upon the whole amount to be paid to the Contractor by reason of the termination of work pursuant to this clause, the Contracting Officer shall, subject to any Settlement Review Board approvals required by NASA Regulations in effect as of the date of execution of this contract, determine, on the basis of information available to him, the amount, if any, due to the Contractor by reason of the termination and shall pay to the Contractor the amounts determined as follows:

(i) for completed supplies accepted by the Government (or sold or acquired as provided in paragraph (b)(vii) above) and not theretofore paid for, a sum equivalent to the aggregate price for such supplies computed in accordance with the price or prices specified in the contract, appropriately adjusted for any saving of freight or other charges;

(ii) the total of—

(A) the costs incurred in the performance of the work terminated, including initial costs and preparatory expense allocable thereto, but exclusive of any costs attributable to supplies paid or to be paid for under paragraph (e) (i) hereof;

(B) the cost of settling and paying claims arising out of the termination of work under subcontracts or orders, as provided in paragraph (b)(v) above, which are properly chargeable to the terminated portion of the contract (exclusive of amounts paid or payable on account of supplies or materials delivered or services furnished by subcontractors or vendors prior to the effective date of the Notice of Termination, which amounts shall be included in the costs payable under (A) above); and

(C) a sum, as a profit, equal to 2 percent of that part of the amount determined under (A) above which represents the cost of articles and materials not processed by the Contractor, plus a sum equal to 8 percent of the remainder of such amount, but the aggregate of such sums shall not exceed 6 percent of the whole of the amount determined under (A) above; *provided*, however, that if it appears that the Contractor would have sustained a loss on the entire contract had it been completed, no profit shall be included or allowed under this subdivision (C) and an appropriate adjustment shall be made reducing the amount of the settlement to reflect the indicated rate of loss; and

(iii) the reasonable costs of settlement, including accounting, legal, clerical, and other expenses reasonably necessary for the preparation of settlement claims and supporting data with respect to the terminated portion of the contract and for the termination and settlement of subcontracts thereunder, together with reasonable storage, transportation, and other costs incurred

in connection with the protection or disposition of property allocable to this contract.

The total sum to be paid to the Contractor under (i) and (ii) of this paragraph (e) shall not exceed the total contract price as reduced by the amount of payments otherwise made and as further reduced by the contract price of work not terminated. Except for normal spoilage, and except to the extent that the Government shall have otherwise expressly assumed the risk of loss, there shall be excluded from the amounts payable to the Contractor as provided in (e) (i) and (ii) (A) above, the fair value, as determined by the Contracting Officer, of property which is destroyed, lost, stolen, or damaged so as to become undeliverable to the Government, or to a buyer pursuant to paragraph (b) (vii).

(f) Any determination of costs under paragraph (c) or (e) hereof shall be governed by the principles for consideration of costs set forth in Part 15, Subpart 2, of the NASA Procurement Regulation as in effect on the date of this contract.

(g) The Contractor shall have the right of appeal, under the clause of this contract entitled "Disputes," from any determination made by the Contracting Officer under paragraphs (c) or (e) above, except that if the Contractor has failed to submit his claim within the time provided in paragraph (c) above and has failed to request extension of such time, he shall have no such right of appeal. In any case where the Contracting Officer has made a determination of the amount due under paragraph (c) or (e) above, the Government shall pay to the Contractor the following: (i) if there is no right of appeal hereunder or if no timely appeal has been taken, the amount so determined by the Contracting Officer, or (ii) if an appeal has been taken, the amount finally determined on such appeal.

(h) In arriving at the amount due the Contractor under this clause there shall be deducted (i) all unliquidated advance or other payments on account theretofore made to the Contractor, applicable to the terminated portion of this contract, (ii) any claim which the Government may have against the Contractor in connection with this contract, and (iii) the agreed price for, or the proceeds of sale of, any materials, supplies, or other things acquired by the Contractor or sold, pursuant to the provisions of this clause, and not otherwise recovered by or credited to the Government.

(i) If the termination hereunder be partial, prior to the settlement of the terminated portion of this contract, the Contractor may file with the Contracting Officer a request in writing for an equitable adjustment of the price or prices specified in the contract relating to the continued portion of the contract (the portion not terminated by the Notice of Termination), and such equitable adjustment as may be agreed upon shall be made in such price or prices.

(j) The Government may from time to time, under such terms and conditions as it may prescribe, make partial payments and payments on account against costs incurred by the Contractor in connection with the terminated portion of this contract whenever in the opinion of the Contracting Officer the aggregate of such payments shall be within the amount to which the Contractor will be entitled hereunder. If the total of such payments is in excess of the amount finally agreed or determined to be due under this clause, such excess shall be payable by the Contractor to the Government upon demand, together with interest computed at the rate of 6 percent per annum, for the period from the date such excess payment is received by the Contractor to the date on which such excess is repaid to the Government; *provided*, however, that no interest shall be charged with respect to any such excess payment attributable to a reduction in the Contractor's claim by reason of retention or other disposition of termination inventory until ten days after the date of such retention or disposition, or such later date as determined by the Contracting Officer by reason of the circumstances.

(k) Unless otherwise provided for in this contract, or by applicable statute, the Contractor, from the effective date of termination and for a period of three years after final settlement under this contract, shall preserve and make available to the Government at all reasonable times at the office of the Contractor but without direct charge to the Government, all his books, records, documents, and other evidence bearing on the costs and expenses of the Contractor under this contract and relating to the work terminated hereunder, or, to the extent approved by the Contracting Officer, photographs, microphotographs, or other authentic reproductions thereof.

11. DISPUTES (September 1962)

(a) Except as otherwise provided in this contract, any dispute

concerning a question of fact arising under this contract which is not disposed of by agreement shall be decided by the Contracting Officer, who shall reduce his decision to writing and mail or otherwise furnish a copy thereof to the Contractor. The decision of the Contracting Officer shall be final and conclusive unless, within thirty (30) days from the date of receipt of such copy, the Contractor mails or otherwise furnishes to the Contracting Officer a written appeal addressed to the Administrator. The decision of the Administrator or his duly authorized representative for the determination of such appeals shall be final and conclusive unless determined by a court of competent jurisdiction to have been fraudulent or capricious, or arbitrary, or so grossly erroneous as necessarily to imply bad faith, or not supported by substantial evidence. In connection with any appeal proceeding under this clause, the Contractor shall be afforded an opportunity to be heard and to offer evidence in support of his appeal. Pending final decision of a dispute hereunder, the Contractor shall proceed diligently with the performance of the contract and in accordance with the decision of the Contracting Officer.

(b) This "Disputes" clause does not preclude consideration of law questions in connection with decisions provided for in paragraph (a) above, *provided*, that nothing in this contract shall be construed as making final the decision of any administrative official, representative, or board on a question of law.

12. RENEGOTIATION (September 1962)

(a) To the extent required by law, this contract is subject to the Renegotiation Act of 1951 (50 U.S.C. App. 1211, *et seq.*), as amended, and to any subsequent act of Congress providing for the renegotiation of contracts. Nothing contained in this clause shall impose any renegotiation obligation with respect to this contract or any subcontract hereunder which is not imposed by an act of Congress heretofore or hereafter enacted. Subject to the foregoing, this contract shall be deemed to contain all the provisions required by Section 104 of the Renegotiation Act of 1951, and by any such other act, without subsequent contract amendment specifically incorporating such provisions.

(b) The Contractor agrees to insert the provisions of this clause, including this paragraph (b), in all subcontracts, as that term is defined in Section 103g of the Renegotiation Act of 1951, as amended.

13. BUY AMERICAN ACT (September 1961)

(a) In acquiring end products, the Buy American Act (41 U.S.C. 10a-d) provides that the Government give preference to domestic source end products. For the purpose of this clause:

(i) "components" means those articles, materials, and supplies which are directly incorporated in the end products;

(ii) "end products" means those articles, materials, and supplies which are to be acquired under this contract for public use; and

(iii) a "domestic source end product" means (A) an unmanufactured end product which has been mined or produced in the United States and (B) an end product manufactured in the United States if the cost of the components thereof which are mined, produced, or manufactured in the United States or Canada exceeds 50 percent of the cost of all its components. For the purposes of this (a) (iii) (B), components of foreign origin of the same type or kind as the products referred to in (b) (ii) or (iii) of this clause shall be treated as components mined, produced, or manufactured in the United States.

(b) The Contractor agrees that there will be delivered under this contract only domestic source end products, except end products:

(i) which are for use outside the United States;

(ii) which the Government determines are not mined, produced, or manufactured in the United States in sufficient and reasonably available commercial quantities and of a satisfactory quality;

(iii) as to which the Administrator determines the domestic preference to be inconsistent with the public interest; or

(iv) as to which the Administrator determines the cost to the Government to be unreasonable.

(The foregoing requirements are administered in accordance with Executive Order No. 10582, dated December 17, 1954.)

14. CONVICT LABOR (September 1962)

In connection with the performance of work under this contract, the Contractor agrees not to employ any person undergoing sentence of imprisonment at hard labor.

15. WALSH-HEALEY PUBLIC CONTRACTS ACT (September 1962)

If this contract is for the manufacture or furnishing of materials, supplies, articles, or equipment in an amount which exceeds or may exceed \$10,000 and is otherwise subject to the Walsh-Healey Public Contracts Act, as amended (41 U.S.C. 35-45), there are hereby incorporated by reference all representations and stipulations required by said Act and regulations issued thereunder by the Secretary of Labor, such representations and stipulations being subject to all applicable rulings and interpretations of the Secretary of Labor which are now or may hereafter be in effect.

16. CONTRACT WORK HOURS STANDARDS ACT—OVERTIME COMPENSATION (November 1964)

This contract, to the extent that it is of a character specified in the Contract Work Hours Standards Act (40 U.S.C. 327-330), is subject to the following provisions and to all other applicable provisions and exceptions of such Act and the regulations of the Secretary of Labor thereunder.

(a) *Overtime Requirements.* No Contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any laborer or mechanic in any workweek in which he is employed on such work to work in excess of eight hours in any calendar day or in excess of forty hours in such workweek on work subject to the provisions of the Contract Work Hours Standards Act unless such laborer or mechanic receives compensation at a rate not less than one and one-half times his basic rate of pay for all such hours worked in excess of eight hours in any calendar day or in excess of forty hours in such workweek, whichever is the greater number of overtime hours.

(b) *Violation; Liability for Unpaid Wages; Liquidated Damages.* In the event of any violation of the provisions of paragraph (a), the Contractor and any subcontractor responsible therefor shall be liable to any affected employee for his unpaid wages. In addition, such Contractor and subcontractor shall be liable to the United States for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic employed in violation of the provisions of paragraph (a) in the sum of \$10 for each calendar day on which such employee was required or permitted to be employed on such work in excess of eight hours or in excess of the standard workweek of forty hours without payment of the overtime wages required by paragraph (a).

(c) *Withholding for Unpaid Wages and Liquidated Damages.* The Contracting Officer may withhold from the Government Prime Contractor, from any moneys payable on account of work performed by the Contractor or subcontractor, such sums as may administratively be determined to be necessary to satisfy any liabilities of such Contractor or subcontractor for unpaid wages and liquidated damages as provided in the provisions of paragraph (b).

(d) *Subcontracts.* The Contractor shall insert paragraphs (a) through (d) of this clause in all subcontracts, and shall require their inclusion in all subcontracts of any tier.

(e) *Records.* The Contractor shall maintain payroll records containing the information specified in 29 CFR 516.2(a). Such records shall be preserved for three years from the completion of the contract.

17. EQUAL OPPORTUNITY (July 1964). *(The following clause is applicable unless this contract is exempt under the rules and regulations of the President's Committee on Equal Employment Opportunity issued pursuant to Executive Order 10925 of March 6, 1961 (26 F.R. 1977), as amended by Executive Order 11114 of June 22, 1963 (28 F.R. 6485).)*

During the performance of this contract, the Contractor agrees as follows:

(a) The Contractor will not discriminate against any employee or applicant for employment because of race, creed, color, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, creed, color, or national origin. Such action shall include, but not be limited to the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor

agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this Equal Opportunity clause.

(b) The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, creed, color, or national origin.

(c) The Contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representative of the Contractor's commitments under this Equal Opportunity clause, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(d) The Contractor will comply with all provisions of Executive Order 10925 of March 6, 1961, as amended by Executive Order 11114 of June 22, 1963, and of the rules, regulations, and relevant orders of the President's Committee on Equal Employment Opportunity created thereby.

(e) The Contractor will furnish all information and reports required by Executive Order 10925 of March 6, 1961, as amended by Executive Order 11114 of June 22, 1963, and by the rules, regulations, and orders of the said Committee, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Committee for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

(f) In the event of the Contractor's noncompliance with this Equal Opportunity clause or with any of the said rules, regulations, or orders, this contract may be cancelled, terminated, or suspended in whole or in part and the Contractor may be declared ineligible for further Government contracts or Federally assisted construction contracts in accordance with procedures authorized in Executive Order 10925 of March 6, 1961, as amended by Executive Order 11114 of June 22, 1963, and such other sanctions may be imposed and remedies invoked as provided in the said Executive Order or by rule, regulation, or order of the President's Committee on Equal Employment Opportunity, or as otherwise provided by law.

(g) The Contractor will include the provisions of paragraphs (a) through (g) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the President's Committee on Equal Employment Opportunity issued pursuant to Section 303 of Executive Order 10925 of March 6, 1961, as amended by Executive Order 11114 of June 22, 1963, so that such provisions will be binding upon each subcontractor or vendor.* The Contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance: *Provided*, however, that in the event a Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the agency, the Contractor may request the United States to enter into such litigation to protect the interests of the United States.

18. OFFICIALS NOT TO BENEFIT (September 1962)

No member of or delegate to Congress, or resident commissioner, shall be admitted to any share or part of this contract, or to any benefit that may arise therefrom; but this provision shall not be construed to extend to this contract if made with a corporation for its general benefit.

19. COVENANT AGAINST CONTINGENT FEES (February 1962)

The Contractor warrants that no person or selling agency has been employed or retained to solicit or secure this contract upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee, excepting bona fide employees or bona fide established commercial or selling agencies maintained by the Contractor for the purpose of securing business. For breach or violation of this warranty, the Government shall have

*Unless otherwise provided, the Equal Opportunity clause is not required to be inserted in subcontracts below the second tier, except for subcontracts involving the performance of "construction work" at the "site of construction" (as those terms are defined in the Committee's rules and regulations) in which case the clause must be inserted in all such subcontracts. Subcontracts may incorporate by reference the Equal Opportunity clause.

the right to annul this contract without liability or in its discretion to deduct from the contract price or consideration, or otherwise recover, the full amount of such commission, percentage, brokerage, or contingent fee.

20. AUTHORIZATION AND CONSENT (September 1962)

The Government hereby gives its authorization and consent for all use and manufacture of any invention described in and covered by a patent of the United States in the performance of this contract or any part hereof or any amendment hereto or any subcontract hereunder (including any lower tier subcontract).

21. NOTICE AND ASSISTANCE REGARDING PATENT AND COPYRIGHT INFRINGEMENT (November 1964)

(The provisions of this clause shall be applicable only if the amount of this contract exceeds ten thousand dollars (\$10,000).)

(a) The Contractor shall report to the Contracting Officer, promptly and in reasonable written detail, each notice or claim of patent or copyright infringement based on the performance of this contract of which the Contractor has knowledge.

(b) In the event of any claim or suit against the Government on account of any alleged patent or copyright infringement arising out of the performance of this contract or out of the use of any supplies furnished or work or services performed hereunder the Contractor shall furnish to the Government, when requested by the Contracting Officer, all evidence and information in possession of the Contractor pertaining to such suit or claim. Such evidence and information shall be furnished at the expense of the Government except where the Contractor has agreed to indemnify the Government.

22. REPORTS OF WORK (September 1962)

(a) *Monthly Progress Reports.* The Contractor shall submit separate monthly progress reports of all work accomplished during each month of contract performance. Reports shall be in narrative form, and brief and informal in content. Monthly reports shall include:

- (i) a quantitative description of overall progress;
- (ii) an indication of any current problems which may impede performance, and proposed corrective action; and
- (iii) a discussion of the work to be performed during the next monthly reporting period.

Monthly reports shall be submitted in _____ copies, plus a reproducible copy.

(b) *Quarterly Progress Reports.* The Contractor shall submit separate quarterly reports of all work accomplished during each three-month period of contract performance. In addition to factual data, these reports shall include a separate analysis section which interprets the results obtained, recommends further action, and relates occurrences to the ultimate objectives of the contract work. Sufficient diagrams, sketches, curves, photographs, and drawings shall be included to convey the intended meaning. Quarterly reports shall be submitted in _____ copies, plus a reproducible copy.

(c) *Final Report.* The Contractor shall submit a final report which documents and summarizes the results of the entire contract work, including recommendations and conclusions based on the experience and results obtained. The final report shall include tables, graphs, diagrams, curves, sketches, photographs, and drawings in sufficient detail to comprehensively explain the results achieved under the contract. The final report shall be submitted in _____ copies, plus a reproducible copy.

23. RIGHTS IN DATA (September 1964)

(a) The term "Subject Data" as used herein includes writings, sound recordings, pictorial reproductions, drawings, or other graphical representations, and works of any similar nature (whether or not copyrighted) which are specified to be delivered under this contract. The term does not include financial reports, cost analyses, and other information incidental to contract administration.

(b) The Contractor agrees to and does hereby grant to the Government, and to its officers, agents, and employees acting within the scope of their official duties, a royalty-free, nonexclusive, and irrevocable license throughout the world for Government purposes to publish, translate, reproduce, deliver, perform, dispose of, and to authorize others so to do, all Subject Data now or hereafter covered by copyright.

(c) The Contractor shall not include in the Subject Data any copyrighted matter, without the written approval of the Contracting Officer, unless he provides the Government with the written permission of the copyright owner for the Government to use such copyrighted matter in the manner provided in paragraph (b) above.

(d) The Contractor shall report to the Contracting Officer, promptly and in reasonable written detail, each notice or claim of copyright infringement received by the Contractor with respect to all Subject Data delivered under this contract.

(e) Nothing contained in this clause shall imply a license to the Government under any patent or be construed as affecting the scope of any license or other rights otherwise granted to the Government under any patent.

(f) Unless otherwise limited below, the Government may duplicate, use, and disclose in any manner and for any purpose whatsoever, and have others so do, all Subject Data delivered under this contract.

(g) The Contractor recognizes that the Government, or a foreign government with funds derived through the Mutual Security Program or otherwise through the United States Government, may contract for property or services with respect to which the vendor may be liable to the Contractor for charges for the use of Subject Data on account of such a contract. The Contractor further recognizes that it is the policy of the Government not to pay in connection with its contracts, or to allow to be paid in connection with contracts made with funds derived through the Mutual Security Program or otherwise through the United States Government, charges for data which the Government has a right to use and disclose to others, or which is in the public domain, or with respect to which the Government has been placed in possession without restrictions upon its use and disclosure to others. This policy does not apply to reasonable reproduction, handling, mailing, and similar administrative costs incident to the furnishing of such data. In recognition of this policy, the Contractor agrees to participate in and make appropriate arrangements for the exclusion of such charges from such contracts or for the refund of amounts received by the Contractor with respect to any such charges not so excluded.

(h) Notwithstanding any provisions of this contract concerning inspection and acceptance, the Government shall have the right at any time to modify, remove, obliterate, or ignore any marking not authorized by the terms of this contract on any piece of Subject Data furnished under this contract.

(i) Data need not be furnished for standard commercial items or services which are normally or have been sold or offered to the public commercially by any supplier and which are incorporated as component parts in or to be used with the product or process being developed if in lieu thereof identification of source and characteristics (including performance specifications, when necessary) sufficient to enable the Government to procure the part or an adequate substitute, are furnished; and further, proprietary data need not be furnished for other items which were developed at private expense and previously sold or offered for sale, including minor modifications thereof, which are incorporated as component parts in or to be used with the product or process being developed, if in lieu thereof the Contractor shall identify such other items and that "proprietary data" pertaining thereto which is necessary to enable reproduction or manufacture of the item or performance of the process. For the purpose of this clause, "proprietary data" means data providing information concerning the details of a Contractor's secrets of manufacture, such as may be contained in but not limited to his manufacturing methods or processes, treatment and chemical composition of materials, plant layout and tooling, to the extent that such information is not readily disclosed by inspection or analysis of the product itself and to the extent that the Contractor has protected such information from unrestricted use by others.

24. SECURITY REQUIREMENTS (September 1962)

(a) The provisions of this clause shall apply to the extent that this contract involves access to information classified "Confidential" or higher.

(b) NASA shall notify the Contractor of the security classification of this contract and the elements thereof, and of any subsequent revisions in such security classification, by the use of a Security Requirements Check List (DD Form 254), or other written notification.

(c) The Contractor agrees to execute, if it has not already done so, a Security Agreement (DD Form 441) with the Government, represented by the Military Department assigned security cognizance over the Contractor's facility. To the extent the Government has indicated, as of the date of this contract, or thereafter indicates a security classification under this contract as provided in paragraph (b) above, the Contractor, shall safeguard all classified elements of this contract and shall provide and maintain a system of security controls within its own organization in accordance with the requirements of:

(i) the Security Agreement (DD Form 441), including the Industrial Security Manual for Safeguarding Classified Information in effect on the date of this contract, and any modification to the Security Agreement for the purpose of adapting the Manual to the Contractor's business; and

(ii) any amendments to said Manual made after the date of this contract, notice of which has been furnished to the Contractor by the Security Office of the Military Department assigned security cognizance over the facility.

(d) Representatives of the Military Department having security cognizance over the facility, and representatives of NASA, shall have the right to inspect at reasonable intervals the procedures, methods, and facilities utilized by the Contractor in complying with the security requirements under this contract. Should the Government, through these representatives, determine that the Contractor is not complying with the security requirements of this contract, the Contractor shall be informed in writing by the Security Office of the cognizant Military Department of the proper action to be taken in order to effect compliance with such requirements.

(e) If, subsequent to the date of this contract, the security classifications or security requirements under this contract are changed by the Government as provided in this clause and the security costs under this contract are thereby increased or decreased, the contract price shall be subject to an equitable adjustment by reason of such increased or decreased costs. Any such equitable adjustment shall be accomplished in the same manner as if such changes were directed under the "Changes" clause of this contract.

(f) The Contractor agrees to insert, in all subcontracts hereunder which involve access to classified information, provisions which shall conform substantially to the language of this clause, including this paragraph (f) but excluding the last sentence of paragraph (e) of this clause.

(g) The Contractor also agrees that he shall determine that any subcontractor proposed by him for the furnishing of supplies and services which will involve access to classified information in the Contractor's custody has been granted an appropriate facility security clearance, which is still in effect, prior to being accorded access to such classified information.

25. UTILIZATION OF CONCERNS IN LABOR SURPLUS AREAS (September 1962). *(The provisions of this clause shall be applicable if the contract is in excess of \$5,000.)*

It is the policy of the Government to place contracts with concerns which will perform such contracts substantially in areas of persistent or substantial labor surplus where this can be done, consistent with the efficient performance of the contract, at prices no higher than are obtainable elsewhere. The Contractor agrees to use his best efforts to place his subcontracts in accordance with this policy. In complying with the foregoing and with paragraph (b) of the clause of this contract entitled "Utilization of Small Business Concerns," the Contractor in placing his subcontracts shall observe the following order of preference: (i) persistent labor surplus area concerns which are also small business concerns; (ii) other persistent labor surplus area concerns; (iii) substantial labor surplus area concerns which are also small business concerns; (iv) other substantial labor surplus area concerns; and (v) small business concerns which are not labor surplus area concerns.

26. DATA REQUIREMENTS (November 1965)

(a) To the extent that the following data is not elsewhere required to be furnished to the Government under this contract, and is of the type customarily retained in the normal course of business, the Contractor, upon written request of the Contracting Officer at any time during contract performance or within one year after final payment, shall furnish the following:

(1) A set of engineering drawings which will be sufficient to enable the manufacture of items or equipment furnished under this contract (other than components or items of standard commercial design, or items fabricated heretofore) by a firm skilled in the art of manufacturing items or equipment of the general type and character of the items or equipment furnished under this contract or a set of flow sheets and engineering drawings which will be sufficient to enable performance of any process developed under this contract by a firm skilled in the art of practicing processes of the general type and character of such process. Such set or sets of drawings and flow sheets shall be reproducible copies incorporating all changes made in the equipment or process in the form in which it was delivered to the Government.

(2) Any of the following data which is necessary to explain or help Government technical personnel understand any equipment, items, or process developed under the contract and furnished to the Government:

(i) a copy (which shall be a reproducible master if one is so requested) of drawings and other technical data used in or prepared in connection with the development, practice, and testing of any process or processes required under the contract, or with the development, fabrication, and testing of prototype models of equipment or items (other than items of standard commercial design or items fabricated heretofore), if required under the contract.

(ii) a report of all studies made in planning the work, and in developing background research for the work, including citation references to all such background research, and a copy of all compilations, digests, or analyses of such background research compiled in connection with the performance of this contract.

(iii) a copy (which shall be a reproducible master if one is so requested) of design studies, research notes, parameter and tolerance studies, drawings, including Contractor's identification of symbols and markings, specifications, test results, and any other technical information used in any research, development, design, engineering, and testing required in the performance of this contract, including test equipment and related items, together with any information as to safety precautions which may be necessary in connection with the manufacture, storage, or use of the equipment, material, or process, if any, in the event that an equipment, material, or process is the subject of research under this contract.

The Contractor shall not be required to furnish any background data which may be described in (ii) or (iii) above unless such data is essential and closely related to the contract work.

(b) All reports, data, and recorded information which are required to be furnished by the Contractor under this provision, as well as all other reports of a technical nature required to be furnished under this contract, are "Subject Data" within the meaning of the clause of the General Provisions of this contract entitled "Rights in Data."

(c) Nothing contained in this "Data Requirements" clause shall require the Contractor to deliver (1) any data, the delivery of which is excused by paragraph (i) of the clause of the General Provisions of this contract entitled "Rights in Data"; or (2) data previously developed by parties other than the Contractor, independently of this contract and acquired by the Contractor prior to this contract under conditions restricting the Contractor's right to disclose the same. If any of the data requested is in the public domain or copyrighted, it will be sufficient for the Contractor to identify the data and furnish a citation as to where it may be found.

(d) Any reproducible copies requested under this "Data Requirements" clause shall be of a type and prepared in accordance with good commercial practice.

(e) In the event the Contracting Officer requests the delivery of data by the Contractor, as contemplated by (a) above, prior to final payment, such request shall be treated as a change under the clause of this contract entitled "Changes" and an equitable adjustment in the price, if this is a fixed-price contract, or estimated cost and any fixed fee, if this is a cost-type contract, shall be made to cover the cost of preparing drawings called for in (a)(1) above, and of collecting, preparing, editing, duplicating, assembling, and shipping the data requested under (a) above, but only to the extent that the Contractor warrants that such costs were not included in the price (or estimated cost and fixed fee) of the contract. The Contractor shall comply with requests of the Contracting Officer made under (a) above, within one year following final payment, provided that suitable provision is made for reimbursement of the additional costs of complying with such request,

together with a reasonable fee or profit thereon, such additional costs being limited to the costs set forth above, and warranted to have been excluded from the price (or estimated cost and fixed fee) of the contract. Any adjustment or payment under this paragraph (e) shall not include any amount for the value of the data, as distinguished from the costs set forth above.

27. COMPETITION IN SUBCONTRACTING (September 1962). *(The following clause is applicable, if the amount of this contract exceeds \$10,000.)*

The Contractor shall select subcontractors (including suppliers) on a competitive basis to the maximum practical extent consistent with the objectives and requirements of the contract.

28. NOTICE TO THE GOVERNMENT OF LABOR DISPUTES (September 1962)

(a) Whenever the Contractor has knowledge that any actual or potential labor dispute is delaying or threatens to delay the timely performance of this contract, the Contractor shall immediately give notice thereof, including all relevant information with respect thereto, to the Contracting Officer.

(b) The Contractor agrees to insert the substance of this clause, including this paragraph (b), in any subcontract hereunder as to which a labor dispute may delay the timely performance of this contract; except that each such subcontract shall provide that in the event its timely performance is delayed or threatened by delay by any actual or potential labor dispute, the subcontractor shall immediately notify its next higher tier subcontractor, or the prime contractor, as the case may be, of all relevant information with respect to such dispute.

29. FILING OF PATENT APPLICATIONS (September 1962)

(a) Before filing or causing to be filed a patent application disclosing any subject matter of this contract, which subject matter is classified "Secret" or higher, the Contractor shall, citing the thirty (30) day provision below, transmit the proposed application to the Contracting Officer for determination whether, for reasons of national security, such application should be placed under an order of secrecy or sealed in accordance with the provisions of 35 U.S.C. 181-188 or the issuance of a patent should be otherwise delayed under pertinent statutes or regulations; and the Contractor shall observe any instructions of the Contracting Officer with respect to the manner of delivery of the patent application to the U.S. Patent Office for filing, but the Contractor shall not be denied the right to file such patent application. If the Contracting Officer shall not have given any such instructions within thirty (30) days from the date of mailing or other transmittal of the proposed application, the Contractor may file the application.

(b) The Contractor shall furnish to the Contracting Officer, at the time of or prior to the time when the Contractor files or causes to be filed a patent application disclosing any subject matter of this contract, which subject matter is classified "Confidential," a copy of such application for determination whether, for reasons of national security, such application should be placed under an order of secrecy or the issuance of a patent should be otherwise delayed under pertinent statutes or regulations.

(c) In filing any patent application coming within the scope of this clause, the Contractor shall observe all applicable security regulations covering the transmission of classified subject matter.

30. SUBCONTRACTS (September 1962)

No contract shall be made by the Contractor with any other party for furnishing any of the completed or substantially completed articles, spare parts, or work herein contracted for without the written approval of the Contracting Officer as to sources.

31. PRIORITIES, ALLOCATIONS, AND ALLOTMENTS (September 1962)

The contractor shall follow the provisions of DMS Reg. 1 and all other applicable regulations and orders of the Business and Defense Services Administration in obtaining controlled materials and other products and materials needed to fill this order.

32. CHANGES (September 1962)

The Contracting Officer may at any time, by a written order, and without notice to the sureties, if any, make changes, within the general scope of this contract, in any one or more of the following: (i) drawings, designs, or specifications, (ii) method of shipment or packing, (iii) place of inspection, delivery, or acceptance, and (iv) the amount of Government-furnished property. If any such change causes an increase or decrease in the cost of, or the time required for performance of, this contract, or otherwise affects any other provisions of this contract, whether changed or not changed by any such order, an equitable adjustment shall be made (i) in the contract price or time of performance, or both, and (ii) in such other provisions of the contract as may be so affected, and the contract shall be modified in writing accordingly. Any claim by the Contractor for adjustment under this clause must be asserted within sixty (60) days from the date of receipt by the Contractor of the notification of change: *Provided, however,* that the Contracting Officer, if he decides that the facts justify such action, may receive and act upon any such claim asserted at any time prior to final payment under this contract. Failure to agree to any adjustment shall be a dispute concerning a question of fact within the meaning of the clause of this contract entitled "Disputes." However, nothing in this clause shall excuse the Contractor from proceeding with the contract as changed.

33. INTEREST (January 1963)

Notwithstanding any other provision of this contract, unless paid within 30 days all amounts that become payable by the Contractor to the Government under this contract (net of any applicable tax credit under the Internal Revenue Code) shall bear interest at the rate of six percent per annum from the date due until paid. Amounts shall be due upon the earliest one of (i) the date fixed pursuant to this contract, (ii) the date of the first demand for payment, (iii) the date of a supplemental agreement fixing the amount, or (iv) if this contract provides for revision of prices, the date of written notice to the Contractor stating the amount of refund payable in connection with a pricing proposal or in connection with a negotiated pricing agreement not confirmed by contract supplement.

ATTACHMENT IV

MODIFICATION OF THE GENERAL PROVISIONS

The General Provisions, NASA Form 247 (June 1966), are modified as set forth below:

A. Clause 17 entitled "Equal Opportunity" (July 1964) is modified by: (i) the deletion of reference to the President's Committee on Equal Employment Opportunity and substitution in lieu therefor of reference to the Secretary of Labor; (ii) the deletion of reference to Executive Order 10925 of 6 March 1961 as amended by Executive Order 11114 of 22 June 1963 and the substitution in lieu therefor of reference to Executive Order 11246 of 24 September 1965; and (iii) the deletion of reference to Section 303 of Executive Order 10925 of 6 March 1961 and substitution in lieu therefor of reference to Section 204 of Executive Order 11246 of 24 September 1965.

B. Clause 22 entitled "Reports of Work" (September 1962) is deleted in its entirety.

C. A new clause entitled "New Technology" (May 1966), NASA Form 1162 is attached hereto and incorporated herein.

NEW TECHNOLOGY (May 1966)

(This clause comprises five sections: I—Definitions, II—Reporting and Subcontracts, III—Rights, IV—Waived Inventions, and V—Withholding; and the clause paragraphs are lettered consecutively throughout the Sections.)

I—DEFINITIONS

(a) As used in this clause, the following terms shall have the meanings set forth below:

(i) "reportable item" means any invention, discovery, improvement, or innovation, whether or not the same is susceptible of protection under the United States patent laws, which is made in the performance of work under this contract or in the performance of any work done upon an understanding in writing that this contract would be awarded, or made in the performance of any work which is reimbursable under any clause, in this contract providing for reimbursement of costs incurred prior to the date of this contract;

(ii) "made" means conceived or first actually reduced to practice, and "making" means conceiving or first actually reducing to practice;

(iii) "invention" means any reportable item which, in the opinion of the Administrator, falls within a statutory class of patentable subject matter (35 U.S.C. 101, 161, and 171);

(iv) "person" means any individual, partnership, group, corporation, association, institution or other entity;

(v) when this clause is included in any subcontract, "contractor" means subcontractor and "contract" means subcontract; and

(vi) "administrator" means the Administrator of NASA or his duly authorized representative.

II—REPORTING AND SUBCONTRACTS

(b) The Contractor shall furnish to the Contracting Officer a written report concerning each reportable item promptly upon the making thereof. Such report shall include such technical detail as is necessary to identify and to describe fully the nature, purpose, operation and physical (electrical, chemical, etc.) characteristics of the reportable item.

(c) In addition to the reports required in paragraph (b) above, the Contractor shall conduct frequent periodic reviews of the work performed by the Contractor to assure that all reportable items have been reported to the Contracting Officer. Within one month following each annual anniversary date of this contract, until completion of the contract work, and within one month following completion of the contract work, the Contractor shall furnish to the Contracting Officer a written summary of the review activities performed, including a report as required by paragraph (b) above for each reportable item not previously reported, or certifying that there are no reportable items.

(d)(1) The Contractor shall include Sections I through IV (paragraphs (a) through (q)) of this clause in each subcontract he awards under this contract where the performance of research, experimental design, engineering, or developmental work is contemplated and shall set forth in each subcontract the identification of the prime contract and the identification and mailing address of the Contracting Officer.

(2) As to each subcontract of any tier for which the Inventions and Contributions Board makes the findings referred to in paragraph (k) of this clause, the Contractor shall include in the Schedule or elsewhere in such subcontract the statement set forth in said paragraph (k).

(3) In the event of refusal by a subcontractor to accept any of the provisions of this clause other than paragraph (r), the Contractor shall promptly notify the Contracting Officer of such refusal and shall not execute the subcontract in question until provisions have been approved in writing by the Contracting Officer for inclusion in said subcontract.

(4) The Contractor shall furnish promptly to the Contracting Officer a statement listing each subcontractor he awards under this

contract of over fifty thousand dollars (\$50,000) of the type described in paragraph (d)(1) above, stating the name and address of the subcontractor, describing the work to be performed, stating the estimated cost, and giving the estimated completion date of the subcontract. Within one month following each annual anniversary date of this contract, until completion of the contract work, and within one month following completion of the contract work, the Contractor shall furnish to the Contracting Officer a written report listing each such subcontract not previously reported or certifying that no such subcontracts were awarded during the reporting period.

(e) With respect to each subcontract awarded by the Contractor of over fifty thousand dollars (\$50,000) of the type described in paragraph (d)(1) above, the Contractor shall, within one month following completion of the work under such subcontract:

(i) Obtain from an official having authority to execute such subcontract on behalf of the subcontractor a letter certifying compliance by the subcontractor with the paragraphs of this "New Technology" clause included in such subcontract; and

(ii) Submit a copy of such letter directly to the Contracting Officer upon receipt from the subcontractor.

III—RIGHTS

(f)(1) An invention reported under this clause shall be presumed to have been made in the manner specified in paragraphs (1) or (2) of Section 305(a) of the National Aeronautics and Space Act of 1958 [42 U.S.C. 2457(a) (1958)] (hereinafter called "the Act").

(2) The presumption of paragraph (f)(1) above shall be conclusive unless the Contractor at the time of reporting the invention submits to the Contracting Officer a written statement, containing supporting details, demonstrating that the invention was not made in the manner specified in paragraph (1) or (2) of Section 305(a) of the Act.

(3) Regardless of whether the Inventions and Contributions Board has considered the matter, if the Schedule of this contract does not include the statement set forth in paragraph (k) below, the Contractor may, within 60 days from the date of execution of this contract, petition the Administrator for waiver of title to inventions pursuant to 14 CFR section 1245.105, or, after reporting an invention, may petition for waiver of title to that invention pursuant to 14 CFR section 1245.106.

(g) Regardless of whether title to a given invention would otherwise be subject to a waiver or is the subject of a petition for waiver, the Contractor may nevertheless file the statement described in paragraph (f)(2) above. The Administrator will review the information furnished by the Contractor in any such statement and any other available information relating to the circumstances surrounding the making of the invention and will notify the Contractor whether the Administrator has determined that the invention was made in the manner specified in paragraph (1) or (2) of Section 305(a) of the Act.

(h) With respect to each invention which becomes the exclusive property of the United States, the Contractor shall:

(1) Inform the Contracting Officer at the earliest practicable date of any public use or sale by the Contractor of the invention or of any publication by the Contractor describing the invention; and

(2) Furnish, upon written request by the Contracting Officer, such full and complete technical and other information available to the Contractor as is necessary for the preparation of a patent application and for prosecution of such patent application, and, in addition, shall execute or endeavor to secure execution of all lawful documents and instruments determined by the Administrator to be necessary for the preparation and prosecution of applications for Letters Patent covering the invention.

(i) Regardless of any other disposition of rights in the invention, in the case of each reported invention which is determined to have been made in the manner specified in paragraph (1) or (2) of Section 305(a) of the Act, 14 CFR section 1245.113 provides that the Contractor is granted a nonexclusive, irrevocable, royalty-free license to practice such invention together with the right to grant sublicenses of the same scope to the extent the Contractor was legally obligated to do so at the time the contract was awarded. Such license and right will be nontransferable except to a successor of that part of the Contractor's business to which the invention pertains.

(j)(1) The Government may duplicate, use and disclose in any manner and for any purpose whatsoever, and have others do so, all reports furnished pursuant to paragraphs (b), (c), and (h) (2) of this clause.

(2) Nothing contained in this "New Technology" clause shall be deemed to grant any license under any invention as to which rights of the Government are not expressly obtained pursuant to the Act, as implemented by this clause.

IV—WAIVED INVENTIONS

(k) This Section IV (paragraphs (k) through (q) of this clause shall be applicable to this contract only if, pursuant to the NASA Patent Waiver Regulations, 14 CFR section 1245.104, and paragraph 9.101-3 of the NASA Procurement Regulations, there is included in the Schedule of this contract the following statement:

"The Administrator has granted the Contractor's request for waiver under 14 CFR section 1245.104, and Section IV of the New Technology clause is applicable to this contract."

(l) When this Section is applicable to the contract, as provided in paragraph (k) above, the title to any invention made in the performance of work under this contract is subject to a waiver granted by the Administrator pursuant to 14 CFR section 1245.104, and to the conditions, reservations and obligations contained in paragraphs (m), (n), (o), (p), and (q) below.

(m) With respect to any particular invention, the waiver referred to in paragraph (1) above is subject to the following conditions:

(1) That the Contractor report the invention during the term of this contract;

(2) That the invention is determined to have been made in the manner specified in paragraph (1) or (2) of Section 305(a) of the National Aeronautics and Space Act of 1958 (42 U.S.C. 2457(a)) in the performance of work under this contract; and

(3) That the invention is designated at the time of reporting as being an invention upon which the Contractor intends to file or has filed a United States patent application.

(n) With respect to any particular invention, the waiver referred to in paragraph (1) above is subject to the following reservations:

(1) The reservation of an irrevocable, nonexclusive, non-transferable, royalty-free license for the practice of the invention throughout the world by or on behalf of the United States or any agency thereof, state, or domestic municipal government, or any foreign government pursuant to any existing or future treaty or agreement with the United States;

(2) The reservation by the Administrator of the right to require the granting of a license to any applicant on a nonexclusive, royalty-free basis unless:

(i) the Contractor, his licensee, or his assignee has brought the invention to a point of practical application within 3 years after a United States patent issues on the invention and makes its benefits reasonably accessible to the public; or

(ii) within 3 years after a United States patent issues on the invention, such patent has been made available for nonexclusive licensing to any responsible applicant, royalty-free or on the terms that are reasonable in the circumstances; or

(iii) the Contractor shows cause why he should retain the full benefits of waiver for a further period of time; and

(3) The reservation by the Administrator of the right to require the granting of a license to any responsible applicant royalty-free or on terms that are reasonable in the circumstances for such practice of the invention as may be appropriate to satisfy the requirements which may be made by governmental regulations for public use of the invention, as may be necessary to fulfill health needs, or for other public purposes, if any, stipulated in the Schedule of this contract.

(o) With respect to any particular invention, the waiver referred to in paragraph (1) above is voidable at the option of the Administrator unless the contractor shall:

(1) File within eight months from the date of reporting of such an invention, an application for United States Letters Patent disclosing and claiming the invention, and include within the first

paragraph of the specification of such application and any patent issuing thereon the following statement:

"The invention described herein was made in the performance of work under a NASA contract and is subject to the provisions of Section 305 of the National Aeronautics and Space Act of 1958, Public Law 85-568 (72 Stat. 435; 42 U.S.C. 2457)."

(2) Furnish to the Administrator a copy of each patent application, domestic or foreign, filed thereon, together with identifying serial number and filing date promptly upon receipt thereof;

(3) Execute and furnish to the Administrator instruments fully confirmatory of the rights herein reserved by the Government;

(4) In the event the Contractor elects not to continue prosecution of any application filed thereon, notify the Administrator within sufficient time to allow assumption of prosecution by the Government, and deliver to the Administrator such duly executed instruments as are necessary to vest in the Administrator title thereto, including an instrument of assignment to such application;

(5) Convey to the Administrator, on written request, the Contractor's entire right, title and interest in any foreign country in which the Contractor has not filed an application on said invention within:

(i) Nine months from the date a corresponding U.S. application is filed;

(ii) Six months from the date permission is granted to file foreign applications where such filing has been prohibited for security reasons; or

(iii) Such longer periods as may be expressly approved by the Administrator.

(6) Grant any license which the Administrator may require to be granted pursuant to paragraph (n) (2) or (3) above.

(7) Report, upon NASA's written request not more often than annually, the commercial use that is being made or is intended to be made of the invention.

(p) With respect to any particular invention, the waiver referred to in paragraph (1) above is voidable at the option of the Administrator if the patent disclosing and claiming such invention is held to have been used in violation of the antitrust laws in an unappealed or unappealable judgment or order of a court or administrative tribunal of competent jurisdiction.

(q) Before a Contractor is required to grant a license under either paragraph (n) (2) or (3) above, he shall be given an opportunity to show cause before the NASA Inventions and Contributions Board why he should not be required to grant such a license.

V—WITHHOLDING

(r) (1) Except as provided in subparagraphs (3) and (4) below, if the Contractor fails to comply with the provisions of this clause after receipt of a written decision of the Contracting Officer, pointing out where in the Contractor has failed to comply and setting a time limit for compliance, there shall be withheld from payment, unless such failure has been corrected within the time limit set, either five percent (5%) of the amount of this contract as from time to time amended, or fifty thousand dollars (\$50,000), whichever is less.

(2) Without regard to whether a written decision as described in subparagraph (1) above has been issued, after payment of eighty-five percent (85%) of the amount of this contract, as from time to time amended, payment shall be withheld until a reserve of either five percent (5%) of such amount, or fifty thousand dollars (\$50,000), whichever is less, shall have been set aside, such reserve or balance to be retained until the Contractor shall have complied with the provisions of this clause, as well as with such written decision or decisions as may have been issued pursuant to subparagraph (1) above and not withdrawn or successfully challenged on appeal pursuant to the "Disputes" clause.

(3) The maximum amount which may be withheld under this paragraph (r) shall not exceed five percent (5%) of the amount of this contract or fifty thousand dollars (\$50,000), whichever is less. If this contract is a no fee contract with a contractor other than an educational institution, the amount which may be withheld shall not exceed one percent (1%) of the amount of the contract or fifty thousand dollars (\$50,000), whichever is less. No amount shall be withheld pursuant to this Section V so long as an equivalent amount is being withheld under other provisions of this contract.

(4) The withholding provisions of subparagraphs (1) through (3) of this paragraph (r) do not apply to the provisions of paragraph (e) or Section IV of this clause, or to no-fee contracts with an educational institution. The withholding of any amount or subsequent payment thereof to the Contractor shall not be construed as a waiver of any rights accruing to the Government under this contract.

ATTACHMENT V

GENERAL INSTRUCTIONS FOR PREPARATION OF PROPOSALS

I. GENERAL

A. Proposal Format and Instructions

Each proposal shall be submitted in three (3) folders. Folder 1 shall contain thirty (30) copies of the Technical Proposal, Folder 2, thirty (30) copies of the Business Proposal, and Folder 3, thirty (30) copies of the Subsequent Phase Capability Supplement. Proposals shall be unclassified; any classified information will be submitted separately and shall be within the overall page limitation established elsewhere in these instructions.

Unnecessarily elaborate brochures or other presentations beyond those sufficient to present a complete and effective proposal are not desired and may be construed as an indication of the offeror's lack of cost consciousness. Elaborate art work, expensive paper and bindings, and expensive visual or other presentation aids are neither necessary nor desired.

B. Tentative Contract Value

It is anticipated that two or more fixed price research and development contracts will be awarded at a price not to exceed \$50,000.

C. Waived Inventions

Under the NASA Patent Waiver Regulations, 14 C.F.R. §§ 1245.100 et seq., waiver of title to inventions made under NASA contracts may be requested at three different times. Waiver of title to an individual invention may be requested under § 1245.106 after the invention has been identified and reported to NASA. Waiver of title to inventions not yet identified and reported may be requested under § 1245.104, prior to execution of the contract, or under § 1245.105, within sixty (60) days of contract execution. Waiver of title may be requested under any of these sections even though a request under a different section was not made or, if made, was not granted.

If you intend to petition prior to contract execution for waiver of title to all inventions which may be made under

the contract, you must present such petition with your proposal. The findings which must be made in order for such a petition to be granted are set forth in 14 C.F.R. § 1245.104 and in paragraphs 9.101-3(d)(1)-(6) of the NASA Procurement Regulations.

In the event that it is decided to negotiate a contract based on your proposal, your petition will be forwarded to the Inventions and Contributions Board for consideration. The Board will either make the necessary findings and recommend to the Administrator of NASA that the waiver be granted, or inform the Contracting Officer that facts which are readily available are insufficient to permit a decision to be made without unduly delaying the execution of the contract. In the latter event, you will be so notified and, upon execution of the contract, you may request the Board to consider the matter further. If your request for waiver is granted, Section IV of the "New Technology" clause set forth in 9.101-4 of the NASA Procurement Regulations will be made applicable to the contract implementing the waiver.

D. Technical Evaluation Criteria

Your Technical Proposal and applicable portions of your Subsequent Phase Capability Supplement will be evaluated on the basis of the following criteria:

1. Responsiveness to and understanding of the requirements of the total tasks.
2. Proposed organization
 - a. Organizational structure
 - b. Education, other qualifications, experience or skills of key personnel and consultants proposed
 - (1) Management
 - (2) Biomedical
 - (3) Engineering
 - (4) Other applicable disciplines.
3. Engineering and manufacturing capabilities[®]
 - a. Availability and location of facilities and equipment
 - b. Performance in related efforts
4. Directly related experience

E. Business Evaluation Criteria

Your Business Proposal and applicable portions of your Subsequent Phase Capability Supplement will be evaluated on the basis of the following criteria:

1. Financial and business competency
 - a. Adequacy of accounting
 - b. Business practices and company policies
 - c. Sufficiency of operating funds
2. Past performance
3. Proposed business operation and qualifications of business management.
4. Estimated Cost and Profit
 - a. Basis
 - b. Supporting justification
5. Adequacy of management of subcontracting

II. TECHNICAL PROPOSAL (60 pages)

A. General

The proposer shall respond to the instructions in the following paragraphs and follow the given topical outline. As a minimum each proposer shall discuss the concept or method to be employed in addressing the listed issues. Typical examples of expected results should be included. The information requested shall be used, in conjunction with the appropriate plans requested in the business management section of this instruction, to evaluate his understanding of the technical complexity and scope of the project and to evaluate his ability to manage and perform the technical aspects of the study phase of the measurement system definition. The suggested number of pages is shown for each section. The proposer is given the option of modifying these suggestions, maintaining, however, a total of 60 pages or less in the Technical Proposal.

B. Outline

1. Introduction
2. Technical Approach (40 pages)

- a. Measurement/experiment analysis and refinement
- b. Candidate measurement equipment
- c. System definition, including options
- d. On-Board versus post-flight specimen analysis
- e. Modular system design
- f. Data management requirements
- g. Other

A detailed analysis of each problem area cannot be provided in the proposals. In addition to the above points, the proposer shall describe what he considers to be additional areas of significance.

h. Exceptions

The Contractor shall show the degree of any exceptions taken to the requirements of the Statement of Work. Any exceptions must reference paragraph or item number and list the reasons for the exception.

3. Management Plan (15 pages)

a. Organization Chart

Charts of your proposed organization for management and key technical direction for this study phase, shown in relation to your overall organization of the plant or division concerned are to be furnished. Any plans for changes to manage the larger tasks in the definition phase should be stated. Key management, scientific, consultant, and engineering personnel who will be assigned to this program shall be shown on the organization chart which diagrams each area of functional responsibility. The percentage of

time each key individual and consultant will devote to each program, together with applicable resumes of experience and education, shall be provided. Resumes will not be considered as part of the page restriction.

b. Subcontractor Arrangements

In the event that the technical expertise, facilities, or other resources of the offeror will be supplemented to be completely responsive to the technical work statement and where such supplementation is to be achieved through subcontracts, a Subcontract Plan, showing as a minimum, the name and address of the subcontractor, the type of material or service to be obtained, and the contractual relationships, should be included.

4. Related Experience (5 pages)

A statement of recent current experience the Contractor considers to be applicable to this work and that projected for the definition and development phases. No more than the three most applicable contracts should be summarized, including a listing of contract number, contract value, Government contracting office, and Government project manager (name and telephone number).

III. BUSINESS PROPOSAL (20 PAGES)

The Business Proposal shall be in sufficient detail and arranged in a manner that will facilitate evaluation on the basis of the criteria set forth in paragraph I. E. above. The Business Proposal shall not exceed 20 pages.

A. Business Information

The material submitted in your Business Proposal should be supplemented with the following information:

1. The name, address and telephone number of the Government Agency which maintains audit cognizance of your firm. If there is no audit cognizance, please so state.
2. The level of your facility security clearance and the cognizant Government security office.

3. Identification of any portions of the work which will be sub-contracted and the name of the firm who will receive the sub-contracts together with information regarding the extent of competition. Also, identification of any consultants proposed and the tasks to which they will be assigned. Indicate the level of consultant effort.

4. Information relative to your firm's financial stability and available financial resources.

5. Information relative to the nature and effectiveness of your cost reduction program. If no formal program exists, please so state.

B. Price Summary

Your proposal price should be set forth in a summary for which the format below is recommended, supported by such information as is needed to fully evaluate the proposed price.

Price Summary Format

1. Direct Labor

Itemize by employee classifications, showing for each classification your estimate of the required labor hours and hourly rates.

\$ _____

2. Overhead

\$ _____

3. Travel

Itemize transportation and per diem estimates by trip.

\$ _____

4. Other Direct Costs

\$ _____

5. General and Administrative Expenses

\$ _____

6. Price (exclusive of Profit)

\$ _____

7. Profit

\$ _____

8. Total Price

\$ _____

IV. SUBSEQUENT PHASE CAPABILITY SUPPLEMENT (15 pages)

Offerors shall describe their capacity and planned commitments to perform the projected Phase C (Design) and D (Development) of this effort. The capacity and planned commitments shall encompass the management, technical, and business areas and shall discuss personnel, facilities, experience, and subcontractor management.

Criteria for the evaluation of this supplement will be as stated in I. D. and I. E. of this attachment.

This information shall not exceed 15 pages and shall be furnished as a Supplement.

V. CERTIFICATES AND REPRESENTATIONS

The following enclosed series of certificates and representations must be properly signed and submitted with your proposal.

- A. Contingency Fee Statement
- B. Size of Business Statement
- C. Buy American Certificate
- D. Equal Opportunity Compliance Representation
- E. Certificate of Independent Price Determination

THE BIDDER OR OFFEROR REPRESENTS:

1. That he is ___ a regular dealer in, ___ manufacturer of, the supplies offered.
2. (a) That he ___ has, ___ has not, employed or retained any company or person (other than a full time bona-fide employee working solely for the bidder or offeror) to solicit or secure this contract, and (b) that he ___ has, ___ has not, paid or agreed to pay to any company or person (other than a full time bona-fide employee working solely for the bidder or offeror) any fee, commission, percentage or brokerage fee, contingent upon or resulting from the award of this contract; and agrees to furnish information relating to (a) and (b) above as requested by the Contracting Officer. (For interpretation of the representation including the term "bona-fide employee", see Code of Federal Regulations, Title 44, Part 150).

NOTE: If the bidder or offeror, by checking the appropriate box provided therefor in his bid or proposal, has represented that he has employed or retained a company or person (other than a full time bona-fide employee) to solicit or secure this contract, he may be requested by the Contracting Officer to furnish with his proposal a completed standard form 119 (Contractor's statement of contingent or other fees for soliciting or securing Contract). If the bidder or offeror has previously furnished a completed Standard Form 119 to the office issuing this bid or request for proposals, he may accompany his bid or proposal with a signed statement, in lieu of Standard Form 119, (a) indicating when such completed form was previously furnished, (b) identifying by number the previous IFB, RFP, or contract in connection with which such form was submitted, and (c) representing that the statements in such previously furnished form are applicable to this proposal.

3. (a) That he is ___, is not ___, a small business concern. For the purposes of Government procurement, a "small business concern" is a concern, including its affiliates, which is independently owned and operated, is not dominant in the field of operation in which it is bidding on Government contracts, and can further qualify under the criteria set forth in regulations of the Small Business Administration (See Code of Federal Regulations, Title 13, Part 121.3.8).

(b) If he is a small business concern and is not the manufacturer of the supplies offered, he also represents that all supplies to be furnished hereunder ___ will, ___ will not, be manufactured or produced by a small business concern in the United States, its Possessions, or the Commonwealth of Puerto Rico.

4. That he ___ has, ___ has not, participated in a previous contract or subcontract subject to either the equal opportunity clause herein or the clause originally contained in Section 301 of Executive Order 10925; that he ___ has, ___ has not, filed all required compliance reports; and that representations indicating submissions of required compliance reports, signed by proposed subcontractors, will be obtained prior to subcontract awards.

5. And hereby certifies that each end product except the end products excluded below, is a domestic source end product (as defined in the Contract clause entitled "Buy American Act"); and that components of unknown origin have been considered to have been mined, produced, or manufactured outside the United States.

EXCLUDED ITEMS: _____

Contract/bid/proposal
number: _____

Date _____

(Name of Company or Individual)

BY _____
(Signature)

(Typed, printed, or stamped name)

(Title)

CERTIFICATE OF INDEPENDENT PRICE DETERMINATION (JUNE 1964)

(a) By submission of this bid or proposal, each bidder or offeror certifies, and in the case of a joint bid or proposal, each party thereto certifies as to his own organization, that in connection with this procurement:

(1) the prices in this bid or proposal have been arrived at independently, without consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or offeror or with any competitor;

(2) unless otherwise required by law, the prices which have been quoted in this bid or proposal have not been knowingly disclosed by the bidder or offeror and will not knowingly be disclosed by the bidder or offeror prior to opening, in the case of a bid, or prior to award, in the case of a proposal, directly or indirectly to any other bidder or offeror or to any competitor; and

(3) no attempt has been made or will be made by the bidder or offeror to induce any other person or firm to submit or not to submit a bid or proposal for the purpose of restricting competition.

(b) Each person signing this bid or proposal certifies that:

(1) he is the person in the bidder's or offeror's organization responsible within that organization for the decision as to the prices being bid or offered herein and that he has not participated, and will not participate, in any action contrary to (a)(1) through (a)(3) above; or

(2)(a) he is not the person in the bidder's or offeror's organization responsible within that organization for the decision as to the prices being bid or offered herein but that he has been authorized in writing to act as agent for the persons responsible for such decision in certifying that such persons have not participated, and will not participate, in any action contrary to (a)(1) through (a)(3) above, and as their agent does hereby so certify; and (b) he has not participated, and will not participate, in any action contrary to (a)(1) through (a)(3) above.

(c) This certification is not applicable to a foreign bidder or offeror submitting a bid or proposal for a contract which requires performance or delivery outside the United States, its possessions, and Puerto Rico.

(d) A bid or proposal will not be considered for award where (a)(1), (a)(3), or (b) above has been deleted or modified. Where (a)(2) above has been deleted or modified, the bid or proposal will

not be considered for award unless the bidder or offeror furnishes with the bid or proposal a signed statement which sets forth in detail the circumstances of the disclosure and the Administrator, or his designee, determines that such disclosure was not made for the purpose of restricting competition.

Date _____

Firm _____

Signature _____

Title _____

