

44-1-19922

AMENDMENT OF SOLICITATION MODIFICATION OF CONTRACT

CONTRACT ID CODE PAGE OF PAGES  
1 87

|  |                   |   |                                |
|--|-------------------|---|--------------------------------|
| 2. AMENDMENT/MODIFICATION NO.<br>2   | 3. EFFECTIVE DATE | 4. REQUISITION/PURCHASE REQ. NO.          | 5. PROJECT NO. (If applicable) |
| 6. ISSUED BY<br>National Aeronautics and Space Administration<br>Langley Research Center<br>Hampton, VA 23665-5225 |                   | 7. ADMINISTERED BY (If other than Item 6) |                                |

|   |                                     |   |
|---|-------------------------------------|---|
| 8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code)<br><br>TO ALL CONCERNED | <input checked="" type="checkbox"/> | 9A. AMENDMENT OF SOLICITATION NO.<br>1-39-1270.0267 |
|   | <input checked="" type="checkbox"/> | 9B. DATED (SEE ITEM 11)<br>4/27/92                  |
|   |                                     | 10A. MODIFICATION OF CONTRACT/ORDER NO.             |
|   |                                     | 10B. DATED (SEE ITEM 13)                            |
| CODE  | FACILITY CODE                       |   |

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

The above number solicitation is amended as set forth in item 14. The hour and date specified for receipt of Offers  is extended,  is not extended. Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods: (a) By completing Items 8 and 15, and returning 1 copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGEMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If Required)

13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

|                                     |  |
|-------------------------------------|--|
| <input checked="" type="checkbox"/> | A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify Authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT/ORDER NO. IN ITEM 10A.   |
|                                     | B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b). |
|                                     | C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:   |
|                                     | D. OTHER (Specify type of modification and authority)  |

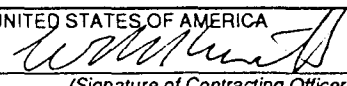
E. IMPORTANT: Contractor  is not,  is required to sign this document and return \_\_\_\_\_ copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible)

Subject: RFP No. 1-39-1270.0267 for Instrument Support Services

The purposes of this amendment are to (1) make revisions to the RFP, (2) provide information pertaining to the preproposal conference held on May 18, 1992, and (3) extend the date for receipt of proposals from June 11, 1992, to June 17, 1992, 4:00 p.m., local time.

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

|   |                  |  |                             |
|---|------------------|--|-----------------------------|
| 15A. NAME AND TITLE OF SIGNER (Type or Print)                           |                  | 16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or Print)<br>William R. Kivett  |                             |
| 15B. CONTRACTOR/OFFEROR<br><br>(Signature of person authorized to sign) | 15C. DATE SIGNED | 16B. UNITED STATES OF AMERICA<br>BY <br>(Signature of Contracting Officer) | 16C. DATE SIGNED<br>5-28-92 |

## LISTING OF ENCLOSURES

- Enclosure 1: Revisions to RFP 1-39-1270.0267, 2 pages
- Enclosure 2: Questions and Answers, 12 pages
- Enclosure 3: List of Attendees at Preproposal Conference,  
3 pages
- Enclosure 4: Terms and Conditions Applicable to the Facilities  
Contract (NAS1-18588F), 12 pages
- Enclosure 5: Copies of the Preproposal Conference View-Graphs,  
46 pages
- Enclosure 6: List of Representative Software in Use at the  
Center's National Transonic Tunnel, 10 pages

ENCLOSURE 1

REVISIONS TO RFP 1-39-1270.0267

The following revisions are hereby made to RFP 1-39-1270.0267:

I. H.7, Security Clearance for Contractor Employees, is deleted in its entirety and the following article is substituted in lieu thereof:

"H.7 EMPLOYEE'S SECURITY CLEARANCE (LaRC 52.204-90)  
(JUN 1988)

By virtue of their particular work assignment, certain Contractor employees may be required to have a security clearance granted in accordance with DOD 5220.22M, the Department of Defense Industrial Security Manual for Safeguarding Classified Information (ISM). CONFIDENTIAL security clearances shall be issued by the Contractor's Security Officer. SECRET or higher clearances shall be issued by the Department of Defense (DOD). Within 10 working days after an employee is identified by the Government and/or the Contractor as requiring a SECRET or higher clearance, the Contractor shall submit to the Contracting Officer evidence of the submittal of a request for clearance to DOD for such employee. If the clearance for an employee has not been issued by DOD within 120 calendar days of the submittal of the request for clearance to DOD, the Contractor may be required to remove such employee from the contract."

II. Exhibit A, Contract Documentation Requirements, paragraph I.O (Ref: page 52 of the RFP), is deleted in its entirety and the following paragraph is substituted in lieu thereof:

"O. Biweekly Manpower Report--On a biweekly basis, the Contractor shall submit a man-hour utilization report illustrating the actual man-hours expended."

III. L.38, Proposal Preparation and Submission - Special Instructions, paragraph C.2 (Ref. page 107 of the RFP), is deleted in its entirety and the following paragraph is substituted in lieu thereof:

"2. Based upon previous experience with procurements of this size and complexity, the Government estimates that the items to be addressed can be adequately covered in a total of one hundred (100) pages, inclusive of charts, graphs, fold-outs, tables, diagrams, photographs, and figures, but exclusive of the cover page; table of contents; tabs; dividers; position descriptions, hiring vacancy announcements, or sample resumes required by Subfactor 4, Organization (Ref: paragraph d, page 111 of the RFP); and resumes, letters of commitment, and personal references for the proposed key personnel required by Subfactor 5, Key Personnel (Ref: paragraph e, page 111 of the RFP). It is recommended that the following guidelines be used: (1) all text should be printed black on white paper; (2) standard

ENCLOSURE 2

QUESTIONS AND ANSWERS

## Questions and Answers

- (1a) Q: (Ref. L.38, C.2, Pg. 107) Volume I of the proposal must address the normal Mission Suitability subfactors and respond to 10 representative work order problems. Considering the type size (12 point) and double-spacing (12-point leading) requirements, the 100 page limit is very restrictive. Please consider using (1) the spacing requirements in your Solicitation No. 1-41-3530.2301; Operation and Routine Maintenance of the Ancillary Systems of the National Transonic Facility, i.e., "Proposals Prepared on a Word Processor--type shall be no smaller than 12 point with 4 points of leading between lines." [See page 95]; or (2), 12-point type, single-spaced text--the format of this question set.
- (1b) Q: Section L.38 C.2 (page 107): This paragraph states that "Type should be no smaller than 12 points..." We find no fault with this request for the general proposal text, but this requirement will impose problems within the proposal graphics (facilities layout, figures, illustrations, and tables). Using this large point size within graphics will severely restrict the necessary notations, comments, and other in-graphics descriptive texts. We request that either this requirement be dropped or reduced to 8 point for in-graphics text.
- (1c) Q: Paragraph L.38C on page 107 of the referenced RFP requires that "type should be no smaller than 12 points; text should be double spaced (at least 12 points of leading between lines) and a pitch of no more than 12 characters per inch. Type size, spacing, and margin requirements should also apply to foldouts." The following changes are hereby requested in order to improve the printing efficiency and allow the effective use of desktop publishing systems such as Ventura.  
(1) Change from 12 point type to 11.5 point. (2) Change from 12 points of leading between lines to 8 points of leading between lines.  
(3) Eliminate the pitch limitation which is based upon the use of mechanical typewriters without proportional spacing capabilities.  
(4) Eliminate the type size requirements for foldouts since foldouts typically include block diagrams, etc. which are shot down from engineering drawings.
- (1d) Q: (Ref. L.38 C.2, pg. 107) Please clarify the requirement "typing size, spacing, and margin requirements should also apply to foldouts."
- (1e) Q: (Sub-factor 4, pg. 111) If sample resumes are used to describe personnel considered essential to the successful performance of the contract, do those sample resumes count against the page count, or may they be included with key personnel resumes and not counted?

(1f) Q: (Sub-paragraph e(12) and (3), pg. 111) Do letters of commitment and personal references count in against the recommended 100-page limit?

A: **The Government guidelines set forth in L.38 C.2 (page 107) will be revised, via Amendment 2 to the RFP, to read as follows:**

**"2. Based upon previous experience with procurements of this size and complexity, the Government estimates that the items to be addressed can be adequately covered in a total of one hundred (100) pages, inclusive of charts, graphs, tables, diagrams, photographs, and figures, but exclusive of the of the cover page; table of contents; tabs, dividers; position descriptions, hiring vacancy announcements, or sample resumes required by Subfactor 4, Organization (Ref: paragraph d, page 111 of the RFP); and resumes, letters of commitment, and personal references for the proposed key personnel required by Subfactor 5, Key Personnel (Ref: paragraph e, page 111 of the RFP). It is recommended that the following guidelines be used: (1) all text should be printed black on white paper; (2) standard page size should be one side of one sheet, 8 1/2" x 11", with one inch margins on all sides; (3) narrative text should be 12 point type size with no less than 6 points of leading between lines; and (4) type size for charts, graphs, tables, diagrams, photographs, and figures should be easily readable. All pages of each volume should be numbered sequentially. The intent of the guidelines listed above is to facilitate a thorough and expedient evaluation of your proposal."**

(2) Q: Solicitation Paragraph, L.37, at page 106, requires the contractor to provide transportation for all required services of the Statement of Work. Solicitation Paragraph, L.38 E. 1.c. (5) (f) indicates that the ODC cost limitation refers to material and travel. Does the material component of this ODC cost limitation include the cost of contractor purchased/leased vehicles? Should vehicle expense be bid separately?

A: **Costs for contractor purchased/leased vehicles are not included in the ODC cost limitation (Ref: B.3.B, page 3). Yes, vehicle expense should be proposed separately (Ref: L.38, paragraph E.1.c, page 113).**

(3) Q: (Ref. H.18, pg. 18) What contractor-provided office and laboratory furnishings and vehicles will be available to the successor contractor?

A: Provisions similar to H-18 and H-19 of the RFP were not included in the current contract. Therefore, any such agreements between the incumbent and successor for the sale or lease of Contractor-provided property would have to be worked out between the incumbent and the successor.

(4) Q: (Ref. Sub-para c(4), pg. 113 and Attachment 13, second paragraph, pg. 278) What is the Government's estimate for the time to relocate and install GFE at the successor contractor's facility? What constitutes "Installing" the GFE?

A: Assume relocating/installing will be completed in 2 weeks beginning October 1, 1992. Installing means making the equipment operational.

Q: Sub-para 1.10, pg. 32 incorporates FAR 52.222-2 "Payment for Overtime Premium" in this contract. Sub-paragraph (a) indicates that overtime premium will not exceed "zero." Since overtime is to be priced for all direct level of effort employees (Section L, sub-section E.1.C(5), page 113), it appears that employees covered by the provisions of the Fair Labor Standards Act are being denied premium on overtime hours worked. Please explain the apparent disparity.

No disparity exists, FAR 52.222-2 "Payment for Overtime, paragraph(a) authorizes overtime premiums in four (4) instances. It is anticipated that the overtime hours set forth in paragraph c(5), page 113 will fall under one of the four (4) exception; therefore, offerors should price the overtime hours set forth in paragraph c(5) on page 113 accordingly.

Q: Attachment 11, page 249) In addition to NMIS, what additional government work tracking systems will be in place? Please describe function, including capability for monitoring procurement and work progress.

Order Control System is an evaluation subfactor ref: Subfactor 1 - Subfactor 3 - Operations Plan. Several software packages will be provided as GFE, i.e., Advanced Revelation, DBASE IV, and Mettract. Utilization is optional. No tracking system currently is available to monitor

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**procurement. NASA equipment Management System (NEMS) will be available, which tracks controlled property.**

(7) Q: (Ref: L.32, pg. 104-105) Please provide an organizational breakdown of IRD and identify the assignment and function of the technical monitors.

A: **An organizational chart for the Instrument Research Division is provided in the Preproposal Conference briefing material.**

**Technical monitors facilitate the flow of work to the Contractor. They review all work orders. They evaluate the Contractor's work in terms of quality, timeliness, and efficiency. They provide technical expertise for the varied functional aspects of the contract.**

(8) Q: (Ref. Sub-paragraph c(1), pg. 109) Please explain the term "on-line."

A: **The term "on-line" as applied to an instrument means that the instrument is operational, already installed in a measurement process.**

(9) Q: (Ref. G-1, pg. 8) How do maintenance requests flow down to the work order and subsequently to the Contractor?

A: **Work orders will come to the Contractor in two ways. Emergency or priority service requests will be phoned in to the Contractor for immediate attention with a follow-up work order subsequently generated and approved by the Government. Routine work orders with longer lead times will be forwarded to the Contractor on a twice daily basis.**

(10) Q: (Ref. Sub-paragraph 1.2.4, pg. 5) How do work orders reach the Contractor for 30-minute "emergency or quick-turn around" requirements? Does the 30-minute response time apply during third shift and on weekends? If so, please described the Government's procedure during third shift and on weekends?

A: **See Answer 9 above. The 30 minute response time does not apply to 3rd shift or weekends.**

(11) Q: Please provide any additional information available to assisting us in developing our staffing skills mix as required by Paragraph L.38.D.3a(2) at RFP page 108. An example is as follows: (a)

A sample of the incumbent's current distribution of labor categories across active work orders.

- A: **The incumbent's current labor distribution across work orders is considered proprietary. Information pertaining to work orders may be found in the Bidders' Library (Ref: Attachment 9 to the RFP).**
- (12) Q: Is there a central tech library for instrumentation at LaRC that will be maintained by the contractor? If so, this requirement is not presently reflected in the solicitation.?
- A: **No, however, Repair and Maintenance pages 278/279 of the RFP discusses requirements for accommodating 14,000 service manuals in the Contractor's facility.**
- (13) Q: RFP Paragraph, C.1, Task 2.1, at page 5, addresses the requirement to contact instrument manufacturers for repair of defective instrumentation still under warranty. Will the contractor also be required to coordinate with instrument manufacturers to effect repairs not within the contractor's repair capability?
- A: **Yes**
- (14) Q: Solicitation Paragraph H.7, at page 15, indicated "Confidential security clearances shall be issued by the Contractor's Security Officer." It is our understanding that current ISM requires that all security clearances, including confidential, must be issued through DISCO. Please clarify if this interpretation is correct.
- A: **Your interpretation is correct. The solicitation will be modified to correct Paragraph H.7 to reflect that all security clearances must be issued through the Department of Defense (DISCO).**
- (15) Q: Solicitation, paragraph H.18, and the Statement of Work acknowledge the need for Contractor-Provided vehicles. How many and what types of the vehicles are currently in service for this activity? Will the incumbent's contract vehicles be available for purchases?
- A: **Ref. L.37, Transportation, page 106 which requires the Contractor to furnish all transportation to perform the required services described in the Statement of Work except for a few exceptions. The types and quantities of vehicles represent an**

offeror's unique approach for performing the required services; therefore, this information will not be provided. The current contract (NAS1-18552) does not include provisions similar to H.18 and H.19 which provide for transfer of the incumbent's vehicles.

- (16) Q: Can you provide an inventory of the equipment referenced in your Solicitation number 1-39-1270.0267, paragraph 2.3?
- A: **A representative listing of the ADP equipment referenced in SOW Task 2.3 is included in the Bidders' Library. (Ref: Attachment 9 to the RPF).**
- (17) Q: Section C.1, para 2.3 (page 6): What documentation services are required?
- A: **Documentation for the digital systems portion of the contract includes engineering technical drawings, figures, tables, requirements manuals, top level design manuals, users manuals, theory manuals, configuration control manuals, and other typical documentation required in support of engineering and maintenance functions. As a guideline, over the period of the last year, approximately 110 manuals were generated, 234 technical drawings, 419 figures, totaling about 11,000 pages of documentation. Many of these manuals are required in multiple copies.**
- (18) Q: Section L.38 D.3a(1), page 108: In reference to relocation of the Government's furnished equipment and materials from the incumbent's facility, will the Government assess a cost to moving this equipment in its probable cost estimates for non-incumbent bids? If so, how much?
- A: **No**
- (19) Q: Section L.38 E.1C(5), pages 113 and 114: Please provide the current conformed positions to the Area Wage Determination and their conformed rates.
- A: **The incumbent's positions under contract NAS1-18552 are all direct matches to the positions defined in the applicable Register of Wage Determinations, therefore no conformance actions were required.**
- (20) Q: Section C, para 1.2.4, page 5: Could the Government please provide us

with an estimate by job title and quantity of how many individuals have historically worked second shift? Third shift? Historically how many emergency service calls have been made during second shift? During third shift?

**A: The level of staffing required to meet emergency service calls on second and third shift can vary depending on wind tunnel run schedules and national priorities for testing of research models. Historically, about five positions have been adequate to support second shift service with additional back-up when required. Third shift service has been provided on an "on-call" basis with service calls averaging about one call per month.**

(21) **Q: Section H, para H-7, page 15: How many current incumbent employees possess secret clearances? Top secret clearances? Please provide the above requested information by both quantities of personnel and job titles.**

**A: There are six top secret clearances required for Acoustic Support personnel. There are 88 secret clearances required for on-site software and instrumentation support personnel who respond to work requests in classified facilities.**

(22) **Q: General: In evaluation of a contractor's project off-site facility will any costs for travel time between this off-site facility and NASA be figured into the Government's most probable cost estimate? If so please provide the formula(s) and factors (e.g., number of trips, rates and how labor costs during transit will be calculated, rate for mileage calculations, etc.) In addition, if an offeror's work approach mitigates the advantages associated with having a facility in close proximity to NASA will this alleviate any cost impacts associated with being further away from NASA? Would the Government please apply its answers to the above questions to how it would evaluate two facilities, both of which are identical and meet the minimum requirements as specified in the RFP, with one 5 minutes away from NASA and one 25 minutes away?**

**A: The Government will consider the effects of facility distance on lost productive time and travel costs. Since it is impossible to anticipate the variety of approaches which may be proposed, it is equally impossible to predetermine formulas for the evaluation.**

- (23) Q: General: Is there unique identification on current drawings, schematics, and manufacturer's manuals?
- A: **No**
- (24) Q: General: What is the Government estimate of the total number of work orders per year?
- A: **30,000**
- (25) Q: Attachment 4: What are the physical dimensions (height, width, length, and weight) of the Dodge, Caravan trucks.
- A: **11' x 6"--Height  
8' x 91/2"--Width  
28' x 7"--Length  
21,500 GVW**
- (26) Q: What master work orders or blanket work orders do you expect to be issued under ISS? If none, does the Government intend for its ISS contractor to individually track and report on the tens of thousands of small individual work orders that will be issued under the contract?
- A: **None. Yes.**
- (27) Q: There is a requirement to provide cost and status information both on a weekly and as completed basis (Section G.1.B and G.1.C) on each assigned work order. Is this a different requirement than the DRD biweekly requirement also contained in the RFP (Exhibit A, 1.0.)?
- A. **The RFP will be amended to delete the words "against each assigned work order" from the last sentence of paragraph O, page 52.**
- (28) Q: In order to obtain and provide estimates of benefits cost, we need data on the incumbent workforce including age, tenure, gender, etc. Will the Government provide these data?
- A: **No, this information is not available to the Government.**

(29) Q: Section M, outlines two different evaluation procedures (see subsections A and B). While the alternate procedure described in B seems consistent with Clause L.11(c) (page 98), the procedure at M.1A does not. The Government should specify which procedure A or B, it intends to use. For consistency with the Contract Award clause, M.1A, should probably be deleted.

A: **The Government will determine which evaluation method is to be used after receipt of proposals since the alternate procedures are generally used when a limited number of proposals are received.**

(30) Q: Reference page 25. The inclusion of FAR Supplement 18-52.252-70 potentially brings into play numerous other provisions of the NASA Supplement. Is this clause required? Please clarify what is meant in the clause by "any statements in the contract requiring compliance with specific provisions of the Federal Acquisition Regulation." For example, it is unclear whether the mere incorporation by reference of a FAR clause constitutes a statement requiring compliance with a specific provision of the Federal Acquisition Regulation.

A: **NFS Clause 18-52.252-70 is a mandatory clause. The clause is intended to advise that whenever a FAR implementing provision is cited, compliance with the implementing NFS clause is also required. For example, FAR 45.5 is cited in Section I, Government Property Clause; therefore 18.45.5 is also applicable.**

(31) Q: Reference page 87, paragraph K18. Both FAR 52.225-12 and 52.225-13 (page 90) have been deleted from the Federal Acquisition Regulations.

A: **Amendment 1 to the RFP deleted the referenced FAR clauses.**

(32) Q: Attachment 13. This implies a requirement for a single 50,000 sq. ft. building. Can more than one building be utilized to meet the RFP space requirements and the tasks described in section 2 to accommodate teaming and subcontracting arrangement?

A: **Yes**

- (33) Q: Will a copy of contract NAS1-18588F which is cited in the subject RFP be provided/available for review Ref: attachment 4)?
- A: **Yes. The twelve-page preface to the GFE listing included in the RFP as Attachment 4 will be sent out with the next RFP amendment. The preface includes various terms and conditions of the facilities contract.**
- (34) Q: Will contractors be permitted to take photographs of the incumbent's facilities while in attending the Preproposal/Pre-Bid Conference?
- A: **No**
- (35) Q: Please provide us with a complete list of all software? Details as to which software is currently in use. Will all of the software and user documentation be turned over to the successful competitor if there is a changeover? If the answer is no, please provide us with a list of software which will not be made available.
- A: **There are an estimated 3.2 million source lines of custom software currently in use at Langley for the wind tunnel data systems. This software falls into several categories--data acquisition, real-time computation and display, model control, hardware diagnostics, configuration control, post test processing, graphics, networking, and commercially available packages. A list for one test facility (the National Transonic Tunnel) will be provided in Amendment 2 to the RFP. The list is representative of the types of software that exist. All software and documentation developed on the current contract is the property of the Government and can be made available as required.**
- (36) Q: Of the 63 positions allocated to ADPE maintenance, how many are associated with distributed ADP systems maintenance--that portion of the work LaRC intends to support under separate contract after October 1993.
- A: **At the May 18, 1992, Preproposal Conference, it was stated that the effort associated with the distributed ADP systems maintenance was expected to be removed from this contract and would performed under a separate contract as of**

October 1, 1993. However, there is currently no firm plan to remove the distributed ADP systems from this contract, therefore, your proposal should assume that the maintenance effort will continue to be supported by this contract for the total potential period of performance (66 months).

(37) Q: Spare parts--are any spares available other than those listed on page 154? Can pieces/parts or whole units of the GFE supplied equipment be used to repair down equipment?

A: **The list beginning on p. 154 is GFE not spares. A list of spares can be found in (See attachment 9 to the RFP), Bidders Library, Room 202, B-1230, as Listing of Government Furnished Materials. No, but units in the spares inventory can be used to effect repairs.**

(38) Q: Please detail LaRC's process of debriefing unsuccessful offerors (when what detail, individual or group, etc.).

A: **NASA conducts its debriefings of unsuccessful companies in competitive negotiated procurements in accordance with 14 CFR Part 1204. Debriefings are held when an offeror submits, prior to the award of the contract, a written request to the Contracting Officer. The debriefing will be held at the earliest feasible time after announcement of the selection decision and normally prior to award of the contract. The general intent of the debriefing is to inform the unsuccessful offeror of the strengths and weaknesses in the hopes of helping the offeror with future competitive endeavors and to provide the basis for selection of the successful Contractor. Debriefings are conducted by the SEB Chairman and NASA Acquisition Division with the individual company requesting the debriefing.**

(39) Q: Will the available operating procedures, manufacturer's specifications, and other documentation be made available to the successor contractor?

A: **Yes, all technical manuals and other related documentation will be provided as GFE.**

(40) Q: Is any flight instrumentation included, e.g., on research aircraft, rocket models, etc.?



A: **Only "BIRDS"--devices for determining flight direction and wind speed, and calibrations of ground-type instrumentation being flown.**

(41) Q: Who is the source selection official?

A: **Dr. H. Lee Beach, Jr. - Deputy Director of the Langley Research Center**

(42) Q: You stated that the Government's estimate is 63 people to support ADPE maintenance and 45 to support data system implementation. Is the Electronic technician support to data system implementation part of the 45 or part of the 63? How many are associated with each task element?

A: **The electronic technician support is part of the 63 people (which are covered under Task 2.3 of the SOW).**

ENCLOSURE 3

LIST OF ATTENDEES

AT INSTRUMENT SUPPORT SERVICES (ISS) PREPROPOSAL CONFERENCE

(MAY 18, 1992)

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Wyle Labs  
3200 Magruder Blvd.  
Hampton, VA 23666  
(8094) 865-0000

S. J. Wasiuk  
Raytheon Service Company  
5740 E. Bayside Road  
Virginia Beach, VA 23455  
(804) 460-2241

D. A. Ware  
Bell Atlantic B.S.S.  
P. O. Box 1456  
Norfolk, VA 23501  
(804) 461-4979

Pat Orange  
Digital Equipment Corporation  
4417 Corporation Lane, Suite 100  
Virginia Beach, VA 23462

Ken Carrington  
The Bionetics Corporation  
MS 330  
Arnold AFB, TN 37389  
(615) 454-5698

William Paik  
The Bionetics Corporation  
2 Eaton Street  
Hampton, VA 23669

James E. Conrad  
Bendix Field Engineering Corporation  
One Bendix Road  
Columbia, MD 21045-1897  
(410) 964-7900

W. S. Collins  
Grumman  
1 Enterprise Pkwy 215  
Hampton, VA 23666  
(804) 825-0700

Dick McCay  
Bendix Field Engineering Corporation  
One Bendix Road  
Columbia, MD 21045  
(410) 964-7900

Dee Perkins  
DTSV  
P. O. Box 12988  
Newport News, VA 23612

Bob Everliegh  
Wyle Labs  
3200 Magruder Blvd.  
Hampton, VA 23666  
(804) 865-0000

Kent M. Oliner  
Bell Atlantic Business System Service  
2101 Executive Drive, Box 58  
Hampton, VA 23666  
(804) 838-3010

Dan Wookcock  
MFS, Inc.  
14000 Thunderbolt  
Chantilly, VA 22123

L. J. Rose  
177 Corinthan Drive  
Newport News, VA 23602  
(804) 877-4372

Bob Silverman  
Grumman  
1 Enterprise Pkwy  
Suite 215  
Hampton, VA 23666  
(804) 825-0700

Howard Hudson  
Raytheon Service Company  
5740 E. Bayside Road  
Virginia Beach, VA 23455  
(804) 460-2241

Joseph L. Eckhoff  
Engineering Management Assoc.  
P. O. Box 320835  
Cocoa Beach, FL 32932-0835

Charles B. Sammet  
The Bionetics Copr.  
Shuttle Calibration Lab  
Mail Stop TBC  
Kennedy Space Center, FL 32399

Thomas A. Grace  
MFSI  
14000 Thunderbolt Place  
Chantilly, VA 22021  
(703) 318-0600

H. Michael Batsel  
MFSI  
14000 Thunderbolt Place  
Chantilly, VA 22021  
(703) 318-0600

Stanley J. Jablecki, Jr.  
Tektronix, Inc.  
700 Professional Drive  
P. O. Box 6026  
Gaithersburg, MD 20884-6026

ENCLOSURE 4

TERMS AND CONDITIONS APPLICABLE TO THE FACILITIES CONTRACT

(NAS1-18588F)

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

2. AMENDMENT IDENTIFICATION NO. 1
3. EFFECTIVE DATE 4/13/88
4. REQUISITION/PURCHASE REC. N/A
5. PROJECT NO. (If applicable)

6. ISSUED BY National Aeronautics and Space Administration
Langley Research Center
Hampton, VA 23665-5225
7. ADMINISTERED BY (If other than Item 6)

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code)
Wyle Laboratories
3200 Magruder Blvd.
Hampton, Va. 23666
9A. AMENDMENT OF SOLICITATION NO.
9B. DATED (SEE ITEM 11)
10A. MODIFICATION OF CONTRACT/ORDER NO.
NAS1-18588F
10B. DATED (SEE ITEM 13)
9/29/88

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers is extended, is not extended.
Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods:
(a) By completing Items 8 and 15, and returning copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER.

12. ACCOUNTING AND APPROPRIATION DATA (If required)
N/A

13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation data, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
D. OTHER (Specify type of modification and authority)

E. IMPORTANT: Contractor is not, is required to sign this document and return 3 copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)

I. The purpose of this Modification No. 1 is to change the period of performance of the contract.
II. Accordingly, the following changes are made to the contract schedule:
A. Section F, Article F-2., Period of performance, is changed as follows:
delete: ten (10) years
insert: five (5) years

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

13A. NAME AND TITLE OF SIGNER (Type or print) P. E. Tobin, Vice President
13B. CONTRACTOR/OFFEROR (Signature of person authorized to sign)
13C. DATE SIGNED 4/6/88
16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) William R. Kivett
16B. UNITED STATES OF AMERICA BY (Signature of Contracting Officer)
16C. DATE SIGNED 4-13-88

|   |  |  |               |   |  |  |
|---|--|--|---------------|---|--|--|
| <b>AWARD/CONTRACT</b>   |  | 1. CERTIFIED FOR NATIONAL DEFENSE UNDER BOSA REG. 2 AND/OR DMS REG. 1  |               | RATING<br><b>DO-A7</b>  | PAGE OF PAGES<br><b>1   59</b>                           |  |
| 2. CONTRACT (Proc. Inst. Ident.) NO.<br><b>NAS1-18588F</b>  |  | 3. EFFECTIVE DATE<br><b>10/1/87</b>  |               | 4. REQUISITION/PURCHASE REQUEST/PROJECT NO.   |  |  |
| 5. ISSUED BY<br><b>National Aeronautics and Space Administration<br/>Langley Research Center<br/>Hampton, Va. 23665-5225</b>  |  | 6. ADMINISTERED BY (If other than Item 5)  |               |   |  |  |
| 7. NAME AND ADDRESS OF CONTRACTOR (No., street, city, county, State and ZIP Code)<br><b>Wyle Laboratories<br/>3200 Magruder Boulevard<br/>Hampton, Va. 23666-1498</b>   |  |  |               | 8. DELIVERY<br><input type="checkbox"/> FOB ORIGIN <input type="checkbox"/> OTHER (See below)   |  |  |
| 9. DISCOUNT FOR PROMPT PAYMENT  |  |  |               | 10. SUBMIT INVOICES (4 copies unless otherwise specified) TO THE ADDRESS SHOWN IN: <input type="checkbox"/> ITEM  |  |  |
| 11. SHIP TO/MARK FOR  |  | FACILITY CODE  |               | 12. PAYMENT WILL BE MADE BY   |  |  |
| 13. THIS ACQUISITION WAS: (Check appl. box(es))   |  | A. ADVERTISED  |               | 14. ACCOUNTING AND APPROPRIATION DATA   |  |  |
|   |  | B. NEGOTIATED PURSUANT TO:<br><input type="checkbox"/> 10 USC 2304(a)( ) <input type="checkbox"/> 41 USC 252(c)( ) |               |   |  |  |
| 15A. ITEM NO.   | 15B. SUPPLIES/SERVICES   |  | 15C. QUANTITY | 15D. UNIT   | 15E. UNIT PRICE  | 15F. AMOUNT  |
|   | Facilities Use Contract to Provide Government-furnished Facilities for Instrument Support Services for Research and Development. |  |               |   |  | Zero Dollars   |
| 15G. TOTAL AMOUNT OF CONTRACT ▶ \$  |  |  |               |   |  |  |
| <b>16. TABLE OF CONTENTS</b>  |  |  |               |   |  |  |
| V) SEC.   | DESCRIPTION  |  |               | PAGE(S)   | V) SEC.  | DESCRIPTION  |
| PART I - THE SCHEDULE   |  |  |               | PART II - CONTRACT CLAUSES  |  |  |
| X   | A  | SOLICITATION/CONTRACT FORM   |               | 1   | I  | CONTRACT CLAUSES   |
| X   | B  | SUPPLIES OR SERVICES AND PRICES/COSTS  |               | 2   | PART III - LIST OF DOCUMENTS, EXHIBITS AND OTHER ATTACH. |  |
| X   | C  | DESCRIPTION/SPECS./WORK STATEMENT  |               | 3   | J  | LIST OF ATTACHMENTS  |
|   | D  | PACKAGING AND MARKING  |               |   | PART IV - REPRESENTATIONS AND INSTRUCTIONS               |  |
| X   | E  | INSPECTION AND ACCEPTANCE  |               | 4   | K  | REPRESENTATIONS, CERTIFICATIONS AND OTHER STATEMENTS OF OFFERORS |
| X   | F  | DELIVERIES OR PERFORMANCE  |               | 5   | L  | INSTRS., CONDS., AND NOTICES TO OFFER                            |
| X   | G  | CONTRACT ADMINISTRATION DATA   |               | 6   | M  | EVALUATION FACTORS FOR AWARD                                     |
| X   | H  | SPECIAL CONTRACT REQUIREMENTS  |               | 7   |  |  |
| <b>CONTRACTING OFFICER WILL COMPLETE ITEM 17 OR 18 AS APPLICABLE</b>  |  |  |               |   |  |  |
| 17. <input checked="" type="checkbox"/> CONTRACTOR'S NEGOTIATED AGREEMENT (Contractor is required to sign this document and return 3 copies to issuing office.) Contractor agrees to furnish and deliver all items or perform all the services set forth or otherwise identified above and on any continuation sheets for the consideration stated herein. The rights and obligations of the parties to this contract shall be subject to and governed by the following documents: (a) this award/contract, (b) the solicitation, if any, and (c) such provisions, representations, certifications, and specifications, as are attached or incorporated by reference herein. (Attachments are listed herein.) |  |  |               | 18. <input type="checkbox"/> AWARD (Contractor is not required to sign this document.) Your offer on Solicitation Number _____ including the additions or changes made by you which additions or changes are set forth in full above, is hereby accepted as to the items listed above and on any continuation sheets. This award consummates the contract which consists of the following documents: (a) the Government's solicitation and your offer, and (b) this award/contract. No further contractual document is necessary. |  |  |
| 19A. NAME AND TITLE OF SIGNER (Type or print)<br><b>P. E. Tobin<br/>Vice President</b>  |  |  |               | 20A. NAME OF CONTRACTING OFFICER<br><b>William R. Kivett</b>  |  |  |
| 19B. NAME OF CONTRACTOR<br>BY <b>[Signature]</b><br>(Signature of person authorized to sign)  |  | 19C. DATE SIGNED<br><b>9/21/87</b>   |               | 20B. UNITED STATES OF AMERICA<br>BY <b>[Signature]</b><br>(Signature of Contracting Officer)  |  | 20C. DATE SIGNED<br><b>9-29-87</b>                               |



## SECTION B

## SUPPLIES OR SERVICES AND PRICES/COSTS

## Article B-1. Services

This contract provides facilities necessary for the performance of Related Contract NAS1-18552 by the contractor in performing instrument repair, maintenance and calibration. The related procurement contract includes provisions which obligates the Government to furnish additional facilities which shall become subject to the provisions of this contract upon receipt. Such facilities will be added to Section J1, Exhibit A of this contract by amendment hereto.

## Article B-2. Scope

This contract provides for the use, maintenance, accountability, and disposition of the facilities identified in Section J1, Exhibit A, which shall be used by the contractor in the performance of the contract delineated in Article B-1 above.

## Article B-3. Allowable Cost and Payment - Facilities Use

For the purpose of the Section I Clause 52.216-14 of the contract entitled "Allowable Cost and Payment - Facilities Use", the allowable cost will be zero dollars and the fixed fee is zero dollars.

## Article B-4. Estimated Cost

For the purpose of Section I, Clause 52.232-21 of this contract entitled "Limitation of Cost (Facilities)", the estimated cost for performance of this contract is zero dollars.

SECTION C  
WORK STATEMENT

Article C-1. Work Statement

The Contractor shall use, maintain, account for, and dispose of the facilities included under this contract in general accordance with Federal Acquisition Regulation (FAR), Subpart 45.5, "Management of Government Property in the possession of Contractors", and Section I, Clause 52.245-11, "Government Property" of this contract.

## SECTION F

## DELIVERIES OR PERFORMANCE

## Article F-1. Place of Use of Facilities

The facilities authorized for use by the contractor under this contract shall be utilized at the contractor's facility located in Hampton, Va.; NASA, Langley Research Center; Wallops Flight Facility; and such other places as may be designated in writing by the Contracting Officer.

## Article F-2. Period of Performance

The use of the facilities authorized under this contract is for a period of ten (10) years from the effective date.

## Article F-3. Use of Facilities

Use of the facilities shall be governed by Section I, Clause 52-245-9 entitled "use and Charges" and are presently authorized for use on a no-charge basis in the performance of NASA Contract NAS1-17000 and other related contracts.

## SECTION G

## CONTRACT ADMINISTRATION DATA

## Article G-1. 52.215.33 Contract Order of Precedence

Any inconsistency in this contract shall be resolved by giving precedence in the following order (a) the Schedule (excluding the specifications); (b) contract clauses; (c) other documents, exhibits, and attachments; and (d) the specifications.

## SECTION H

## SPECIAL CONTRACT REQUIREMENTS

## Article H-1. Government Furnished Property

For the performance of this contract, the Government will furnish the equipment listed in Section J1, Exhibit A.

SECTION I - CONTRACT CLAUSES  
(FACILITIES USE)

ARTICLE I-1. 52.252-2 CLAUSES INCORPORATED BY REFERENCE

This contract incorporates the following clauses by reference, with the same effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available.

I. FEDERAL ACQUISITION REGULATION (48 CFR CHAPTER 1) CLAUSES

| CLAUSE NO. | CLAUSE TITLE - DATE   |
|------------|---|
| 52.202-1   | Definitions (Apr 1984)  |
| 52.203-1   | Officials Not to Benefit (Apr 1984)   |
| 52.203-3   | Gratuities (Apr 1984)   |
| 52.203-5   | Covenant Against Contingent Fees (Apr 1984)   |
| 52.203-7   | Anti-Kickback Procedures (Feb 1987)   |
| 52.204-1   | Approval of Contract (Apr 1984)   |
| 52.204-2   | Security Requirements (Apr 1984)  |
| 52.215-1   | Examination of Records by Comptroller General (Apr 1984)                                  |
| 52.215-2   | Audit--Negotiation (Apr 1984)--Alternate I (Apr 1984)                                     |
| 52.215-33  | Order of Precedence (Jan 1986)  |
| 52.216-14  | Allowable Cost and Payment--Facilities Use (Apr 1984)                                     |
| 52.220-3   | Utilization of Labor Surplus Area Concerns (Apr 1984)                                     |
| 52.222-1   | Notice to the Government of Labor Disputes (Apr 1984)                                     |
| 52.222-3   | Convict Labor (Apr 1984)  |
| 52.222-26  | Equal Opportunity (Apr 1984)  |
| 52.222-35  | Affirmative Action for Special Disabled and Vietnam Era Veterans (Apr 1985)               |
| 52.223-2   | Clean Air and Water   |
| 52.227-1   | Authorization and Consent (Apr 1984)  |
| 52.228-7   | Insurance--Liability to Third Persons (Apr 1984)  |
| 52.232-17  | Interest (Apr 1984)   |
| 52.232-21  | Limitation of Cost (Facilities) (Apr 1984)  |
| 52.233-1   | Disputes (Apr 1984)--Alternate I (Apr 1984)   |
| 52.233-3   | Protest After Award (Jun 1985)--Alternate I (Jun 1985)                                    |
| 52.242-1   | Notice of Intent to Disallow Costs (Apr 1984)   |
| 52.243-2   | Changes--Cost Reimbursement (Apr 1984)--Alternate IV (Apr 1984)                           |
| 52.244-2   | Subcontracts (Cost-Reimbursement and Letter Contracts) (Jul 1985)--Alternate I (Apr 1985) |
| 52.245-8   | Liability for Facilities (Apr 1984)   |
| 52.245-9   | Use and Charges (Apr 1984)  |
| 52.245-11  | Government Property (Facilities Use) (Apr 1984)   |
| 52.249-13  | Failure to Perform (Apr 1984)   |

II NASA/FAR SUPPLEMENT (48 CFR CHAPTER I) CLAUSES

| CLAUSE NO.   | TITLE AND DATE  |
|--------------|---|
| 18-52.245-70 | Acquisition of Existing Government Equipment (Apr 1984) |
| 18-52.252-70 | Compliance with NASA FAR Supplement (Apr 1984)          |

## ARTICLE I-2. CLAUSES IN FULL TEXT

## 1. FEDERAL ACQUISITION REGULATION (48 CHAPTER I) CLAUSES

## 52.246-10 INSPECTION OF FACILITIES (APR 1984)

(a) Definition. "Contractor's managerial personnel," as used in this clause, is defined in the Liaibility for the Facilities clause of this contract.

(b) The Contractor shall provide and maintain an inspection system acceptable to the Government covering the facilities and work for by this contract. Complete records of all inspection work performed by the Contractor shall be maintained and made available to the Government during contract performance and for as long afterwards as the contract requires.

(c) The Government has the right to inspect and test the facilities and work called for the contract to the extent practicable at all places and times, including the period of manufacture. The Government may also inspect the facilities and work at the plant or plants of the Contractor or its subcontractors engaged in the performance of the contract. The Government shall perform inspections and tests in a manner that will not unduly delay the work to be performed by the Contractor under this contract or any related contract.

(d) If the Government performs inspection or test on the premises of the Contractor or a subcontractor, the Contractor shall furnish and shall require subcontractors to furnish all reasonable facilities and assistance for the safe and convenient performance of these duties.

(e) The Contracting Officer may, at any time, require the Contractor to correct or replace facilities or work that is defective or does not conform to contract requirements. Except as provided in paragraph (f) below, corrections and replacements shall be at Government expense if, under the terms of this contract, the facilities or work corrected or replaced were initially furnished or required to be performed at Government expense.

(f) The Contracting Officer may, at any time, require the Contractor to correct or replace facilities or work that is defective or does not conform to contract requirements, without cost to the Government under this contract or any related contract or subcontract, if the defects or failures are due to fraud, lack of good faith, or willfull misconduct on the part of the Contractor's managerial personnel; or to the conduct of one or more of the Contractor's employees selected or retained by the Contractor after any of the Contractor's managerial personnel has responsible grounds to believe that the employee is habitually careless or unqualified.

(g) Corrected or replacement facilities or work shall be subject to this clause in the same manner as facilities or work originally completed under the contract.

## 52.252-6 AUTHORIZED DEVIATIONS IN CLAUSES (APR 1984)

- (a) The use in this contract of any Federal Acquisition Regulation (48 Chapter I) clause with an authorized deviation is indicated by the addition of "(Deviation)" after the name of the regulation.
- (b) The use in this contract of any NASA/FAR Supplement (48 CFR Chapter 18) clause with an authorized deviation is indicated by the addition of "(Deviation)" after the name of the regulation.

## II. NASA/FAR SUPPLEMENT (48 CFR CHAPTER 18) CLAUSES

## 18-52.245-73 FINANCIAL REPORTING OF GOVERNMENT-OWNED/CONTRACTOR-HELD PROPERTY (APR 1984) NASA/FAR SUPPLEMENT

- (a) The Contractor shall prepare and submit annually a NASA form 1018 Report of Government-Owned/Contractor-Held Property, in accordance with the instructions on the form and Subsection 18-45.505-14 of the NASA Far Supplement, except the reporting of space hardware shall be required only upon the written direction of the Contracting Officer identifying the specific project items to be reported.
- (b) If administration of this contract has been delegated to the Department of Defense, the original and three (3) copies of the NASA Form 1018 shall be submitted through the DOD Property Administrator to the NASA office identified below. If administered by NASA, the forms shall be submitted directly to the designated NASA office.

NASA, Langley Research Center  
 Attn: Industrial Property Office, M/S 377  
 Hampton, Va. 23665-5225

- (c) The annual reporting period shall be from July 1 of each year to June 30 of the following year. The report shall be submitted by July 31.
- (d) The Contractor agrees to insert the reporting requirement in all first-tier subcontracts, except that such requirements shall provide for the submission of the subcontract reports directly to the Contractor. The Contractor shall require the subcontractor reports to be submitted to him in sufficient time to meet the reporting date in paragraph (c) above.
- (e) The Contractor's annual report shall consist of a consolidation of subcontractor's reports and the Contractor's report.

## 18-52.252-71 FEDERAL ACQUISITION REGULATION REFERENCES (MAY 1986)

This contract may contain numerical references to segments of the Federal Acquisition Regulation (FAR) that, as if April 1, 1984, had not been promulgated or fully distributed. Pending such action, these segments have been published in NASA Procurement Notices 85-17 and thereby incorporated into the NASA FAR Supplement temporarily. Consequently, a numerical reference to such segments of the FAR contained in the contract shall be deemed to refer to the equivalent reference, prefixed by the number "18-" as set forth in the NASA Procurement Notice 85-17; e.g., a reference to FAR 22.10 would be referring to 18-22.10 as forth in NASA Procurement Notice 85-17.



SECTION J

LIST OF DOCUMENTS, EXHIBITS, AND OTHER ATTACHMENTS

EXHIBIT A

Listing of Government-furnished Facilities

ENCLOSURE 5

COPIES OF THE PREPROPOSAL CONFERENCE VIEW-GRAPHS

# **INSTRUMENT SUPPORT SERVICES**

## **PREPROPOSAL CONFERENCE**

**SOLICITATION 1 - 39 - 1270.0267**

**National Aeronautics and Space Administration**

**Langley Research Center**

**MAY 18, 1992**

# PREPROPOSAL CONFERENCE OUTLINE

- Introduction Conway
- Synopsis of Technical Effort Laney, Krieger
- Source Evaluation Process,  
Projected Schedule Conway
- Outline of Procurement Lacks
- Break
- Questions and Answers Lacks, Conway
- Wrap-up
- Facility Tour

## GENERAL GUIDANCE

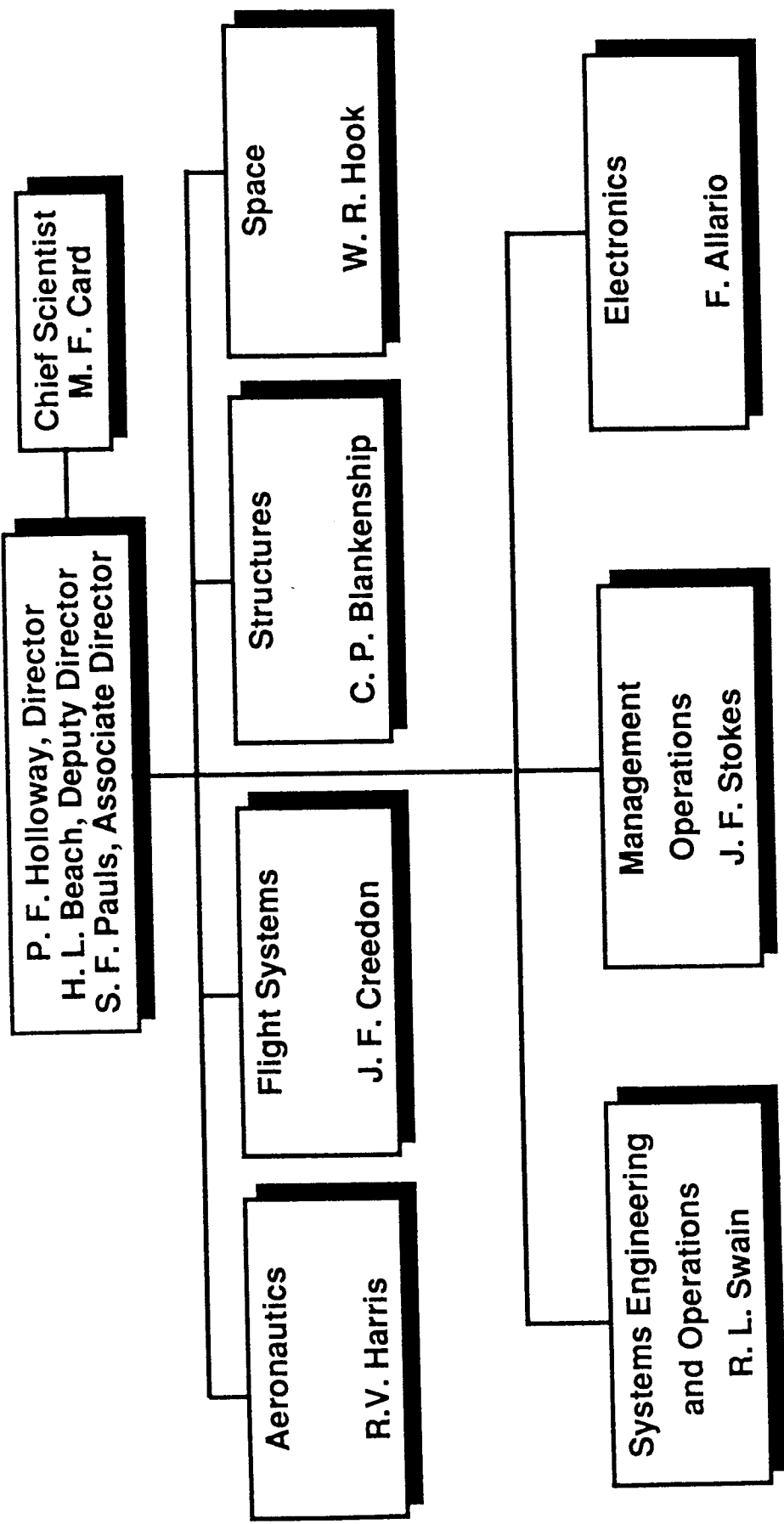
- All questions and answers, copies of viewgraphs, and an attendance list will be forwarded to all firms on bid list as Amendment 2 following this conference
- All revisions to RFP will be in writing; nothing said here today should be construed as revision unless subsequently confirmed by written amendment
- Written questions to be collected during break; previously-submitted questions, plus today's (if possible) will be addressed after break; all will be reflected in Amendment 2 to this RFP
- After today, all questions must be submitted to Mr. Lacks, Contract Specialist (see Sect. L.26 in RFP)

## INTRODUCTION

- Every Langley Directorate receives support under this procurement
- Skills required range from clerk to software specialist
- Resulting contract will be expected to feature a high degree of flexibility, responsiveness
- Effort is deemed "indispensable" by virtually all users of the support services

SOLICITATION 1 - 39 - 1270.0267, INSTRUMENT SUPPORT SERVICES

# LANGLEY RESEARCH CENTER ORGANIZATION



**NASA - LANGLEY RESEARCH CENTER**

## **MISSION**

The mission of the NASA Langley Research Center is to increase the knowledge and capability of the United States in a full range of aeronautical disciplines and in selected space disciplines. This mission will be accomplished by:

- Performing innovative research relevant to national needs
- Transferring technology to users in a timely manner
- Providing development support to other U.S. Government agencies, U.S. industry, and other NASA Centers

**NASA - LANGLEY RESEARCH CENTER**



SOLICITATION 1 - 39 - 1270.0267, INSTRUMENT SUPPORT SERVICES

## AERONAUTICAL AND SPACE DISCIPLINES

- ACOUSTICS
- AERODYNAMICS
- AEROELASTICITY
- AEROTHERMODYNAMICS
- AIRFRAME/PROPULSION INTEGRATION
- ATMOSPHERIC SCIENCES
- CONTROLS AND GUIDANCE
- ELECTROMAGNETICS
- FLIGHT DYNAMICS
- HYPERSONIC PROPULSION
- INFORMATION SCIENCES
- MATERIALS
- MEASUREMENT AND TESTING TECHNIQUES
- REMOTE SENSING
- STRUCTURES
- SYSTEMS ANALYSIS

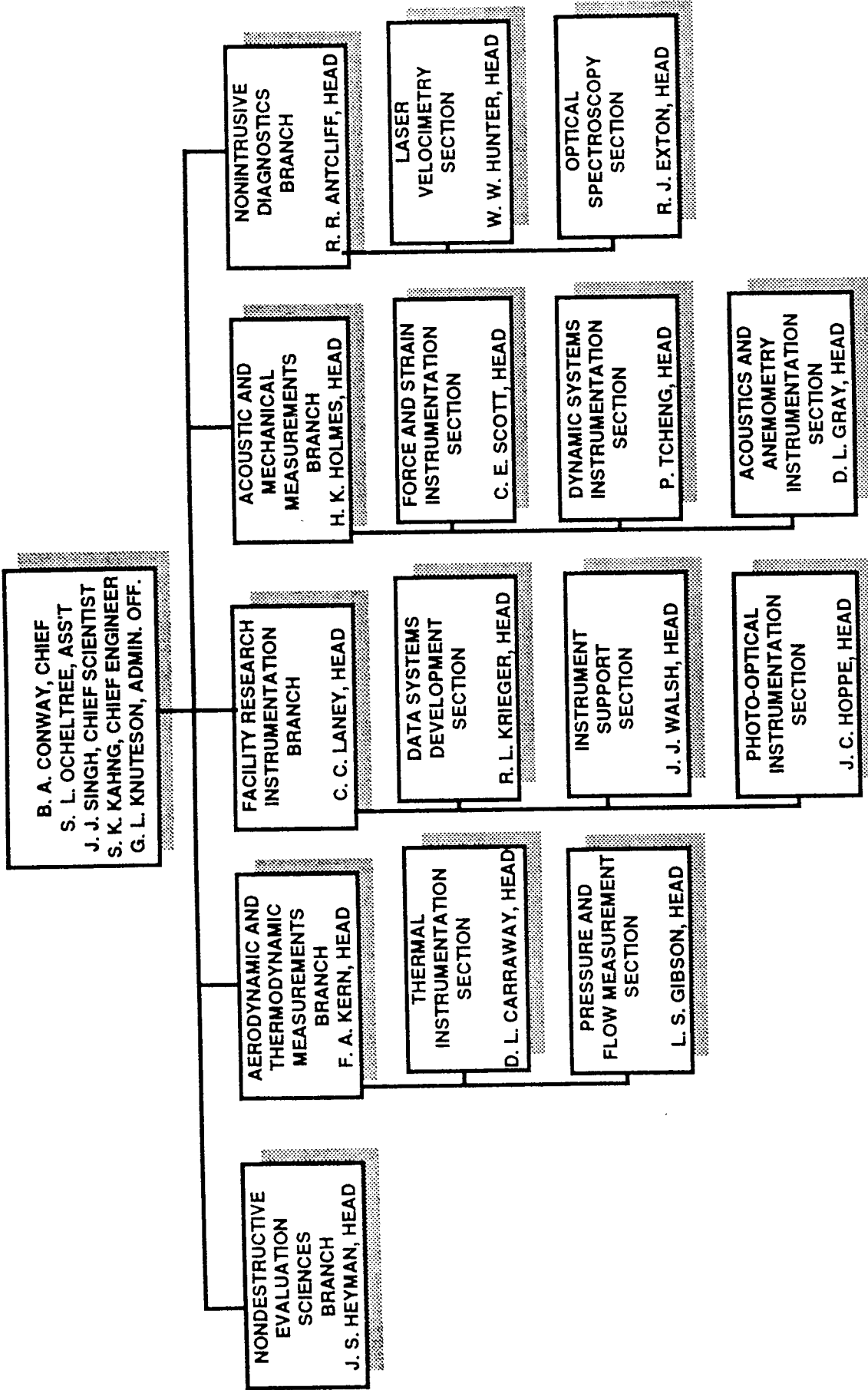
## VEHICLE CLASSES

- SUBSONIC & SUPERSONIC TRANSPORTS
- MILITARY AIRCRAFT/MISSILES
- LARGE SPACE SYSTEMS
- HYPERSONIC AIRCRAFT
- SPACE TRANSPORTATION SYSTEMS

**NASA** - LANGLEY RESEARCH CENTER

SOLICITATION 1 - 39 - 1270.0267, INSTRUMENT SUPPORT SERVICES

# INSTRUMENT RESEARCH DIVISION



**NASA - LANGLEY RESEARCH CENTER**

## **SCOPE OF TECHNICAL EFFORT**

- **Repair, maintenance, calibration of instruments**
- **Evaluation of measurement requirements**
- **Maintenance of automatic data processing equipment (ADPE)**
- **Implementation of instruments and systems to satisfy research objectives**
- **Maintenance of records of instrument history**
- **Operating an instrument loan pool**
- **Design, modification of research data acquisition systems**
- **Receipt and inspection of LaRC-purchased instruments at contractor inspection facilities**
- **Operation of measurement assurance program for LaRC and NASA with traceability to NIST**

# SYNOPSIS OF TECHNICAL EFFORT

## Instrumentation

- Acceptance, installation, maintenance, repair, and calibration of more than 100,000 transducers, instruments, and instrumentation systems

## Data Acquisition Systems

- Acceptance, installation, software development and configuration control, maintenance, and repair of more than 50 large data acquisition system CPU's and several smaller dedicated systems

## Distributed ADP Systems

- Maintenance and repair of more than 5,000 personal computers and workstations, and more than 10,000 peripherals

**NASA - LANGLEY RESEARCH CENTER**

## ESTIMATED CONTRACT STATISTICS

### Division of Effort

- Instrument maintenance, calibration, repair 50%
- Data acquisition system support 25%
- Distributed ADP systems maintenance 25%

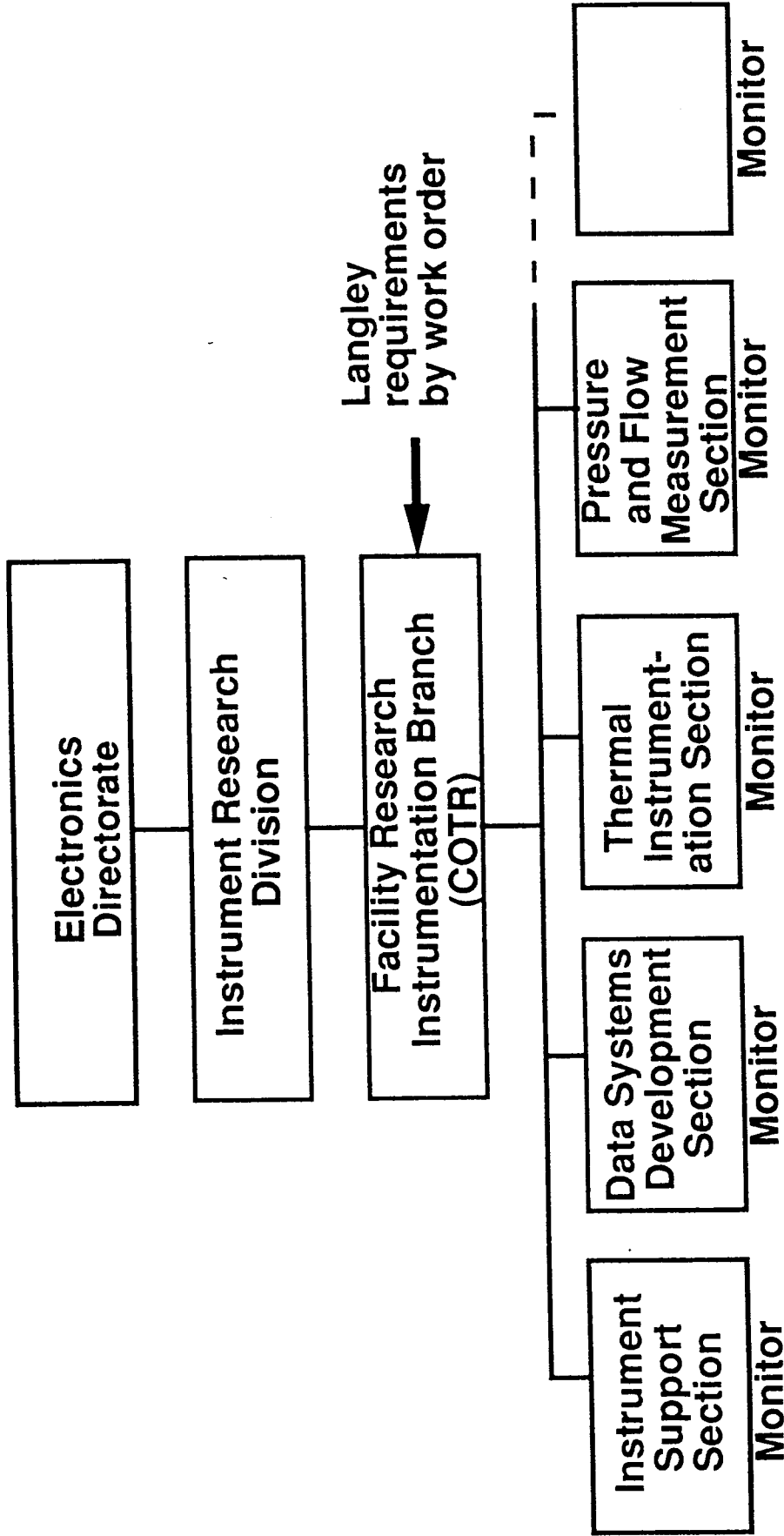
Value of all equipment maintained ≈ \$247M

Estimated MY/yr required (exclusive of ADPE maintenance) 150

**NASA - LANGLEY RESEARCH CENTER**

SOLICITATION 1 - 39 - 1270.0267, INSTRUMENT SUPPORT SERVICES

# NASA - CONTRACTOR TECHNICAL INTERFACE



NASA - LANGLEY RESEARCH CENTER



**INSTRUMENT SUPPORTS SERVICES**

**SOLICATION NO. 1-39-1270.0267**

**MAY 18, 1992**

**TECHNICAL PRESENTATION**



# **WORK STATEMENT TASK AREAS**

**2.1 Instrument repair and maintenance**

**2.2 Calibration**

**2.3 Digital systems**

**2.4 Engineering application**

**2.5 Receipt and inspection of new  
instruments and systems**

**2.6 Instrument pool**

# STATEMENT OF WORK

| <u>Task areas</u>           | <u>Work site</u>               | <u>Estimated<br/>No. of<br/>Personnel</u> |
|-----------------------------|--------------------------------|---|
| 2.1 Repair and maintenance  | Contractor facility/LARC       | 36  |
| 2.2 Calibration             | Contractor facility/LARC       | 17  |
| 2.3 Digital systems         | Contractor facility/LARC       | 108                                       |
| 2.4 Engineering application | LARC/contractor facility/other | 32  |
| 2.5 Receipt and inspection  | Contractor facility            | 7   |
| 2.6 Instrument pool         | LARC                           | 7   |
|                             |                                | 207                                       |

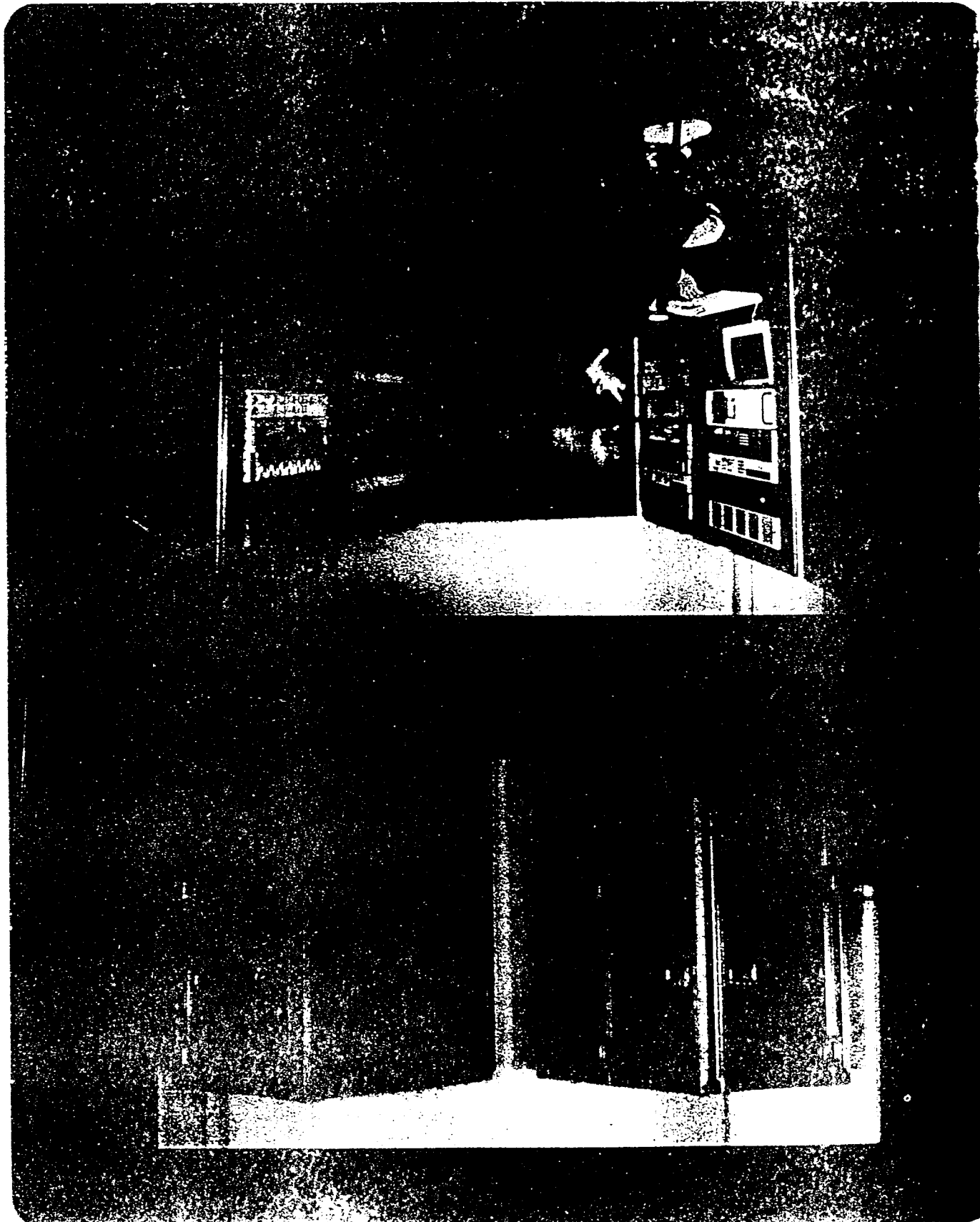
## **2.1 REPAIR AND MAINTENANCE (TYPES OF INSTRUMENTS)**

|   |  |
|---|--|
| <b>Amplifiers</b>                               | <b>Power Supplies</b>                        |
| <b>Cameras</b>                                  | <b>Records, Digital, &amp; Analog</b>        |
| <b>Flight Instruments</b>                       | <b>Signal Conditioners</b>                   |
| <b>Frequency Counters</b>                       | <b>Signal Generators</b>                     |
| <b>Hot Wire Probes</b>                          | <b>Tape Recorders, Digital, &amp; Analog</b> |
| <b>Laser Systems</b>                            | <b>Others</b>                                |
| <b>Manometers</b>                               |  |
| <b>Multimeters, Digital, &amp; Analog</b>       |  |
| <b>Oscillographs</b>                            |  |
| <b>Oscilloscopes</b>                            |  |
| <b>Potentiometers, Self-Balancing-Recording</b> |  |

## **2.2 CALIBRATION (TYPES OF EQUIPMENT)**

|  |   |
|--|---|
| <b>Accelerometers and AOA Systems</b>                          | <b>Temperature Sensors--Thermocouple, PRT, etc.</b>   |
| <b>Acoustic Sensors</b>  |   |
| <b>Amplifiers and Signal Conditioning</b>                      | <b>Time/Frequency Meters</b>                          |
| <b>Dead Weight Testers</b>                                     | <b>Velocity Sensors</b>                               |
| <b>Electronic Data Recorders</b>                               | <b>Voltage Controlled Oscillators and Electronics</b> |
| <b>Flow Meters--Liquid and Gas</b>                             |   |
| <b>Manometers</b>  | <b>Others</b>   |
| <b>M.A.P. Resistance &amp; Voltage Standards</b>               |   |
| <b>Multimeters--Digital and Analog</b>                         |   |
| <b>Oscilloscopes</b>   |   |
| <b>Pressure Sensors-Strain Gage, Capacitance, Quartz, etc.</b> |   |

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## 2.3 DIGITAL SYSTEMS

### HARDWARE MAINTENANCE

- Covers most ADPE at Langley except Central Complex, BDSO, misc.
- 18,000 units maintained from 490 different manufacturers
- 13,000 service calls/year on inventory base valued at \$78.2M (F.Y. 1991)
- Classes of equipment
  - 79 High priority systems
  - 225 Other computer-based systems
    - 55 Modcomps
    - 43 DEC
    - 150 HP
    - 56 Others

## 2.3 DIGITAL SYSTEMS

### HARDWARE MAINTENANCE

- Classes of equipment (cont)
  - 5000 Personal computers
  - 104 Microprocessor systems
  - 100 Misc. systems
  - 500 Graphics workstations
    - 400 Suns
    - 52 Silicon graphics
    - 48 Others

## 2.3 DIGITAL SYSTEMS (CONT)

### ENGINEERING SUPPORT BY MAJOR CATEGORY

#### Estimated Staffing

• Open architecture data systems development 5

• Major data systems replacement effort 14

- Requirements definition
- Hardware and software design
- Installation and testing

• Development support for operational data systems 6

- Enhancements and upgrades
- Operating systems, networking, and graphics



## 2.3 DIGITAL SYSTEMS (CONT)

### ENGINEERING SUPPORT BY MAJOR CATEGORY

Estimated  
Staffing

9

- Management and operations
- Task management services and documentation
- Configuration control and Q/A testing

1

- Miscellaneous small systems
- PC and workstation based data systems

10

- Continuing on-site facility support
- Real-time applications and batch reduction
- Model/sting control/tunnel parameters

TOTAL      45

## **2.3 DIGITAL SYSTEMS (CONT)**

### **DATA SYSTEMS APPLICATIONS AND DESIGN**

- Includes the following functions:
  - Requirements definition
  - Hardware design/fab/test
  - Software design/code/test
  - Hardware/software integration
  - Site install, test, and adapt
  - Documentation
  - Software and hardware configuration control
  - Continuing enhancements/system analysis

## **2.3 DIGITAL SYSTEMS (CONT)**

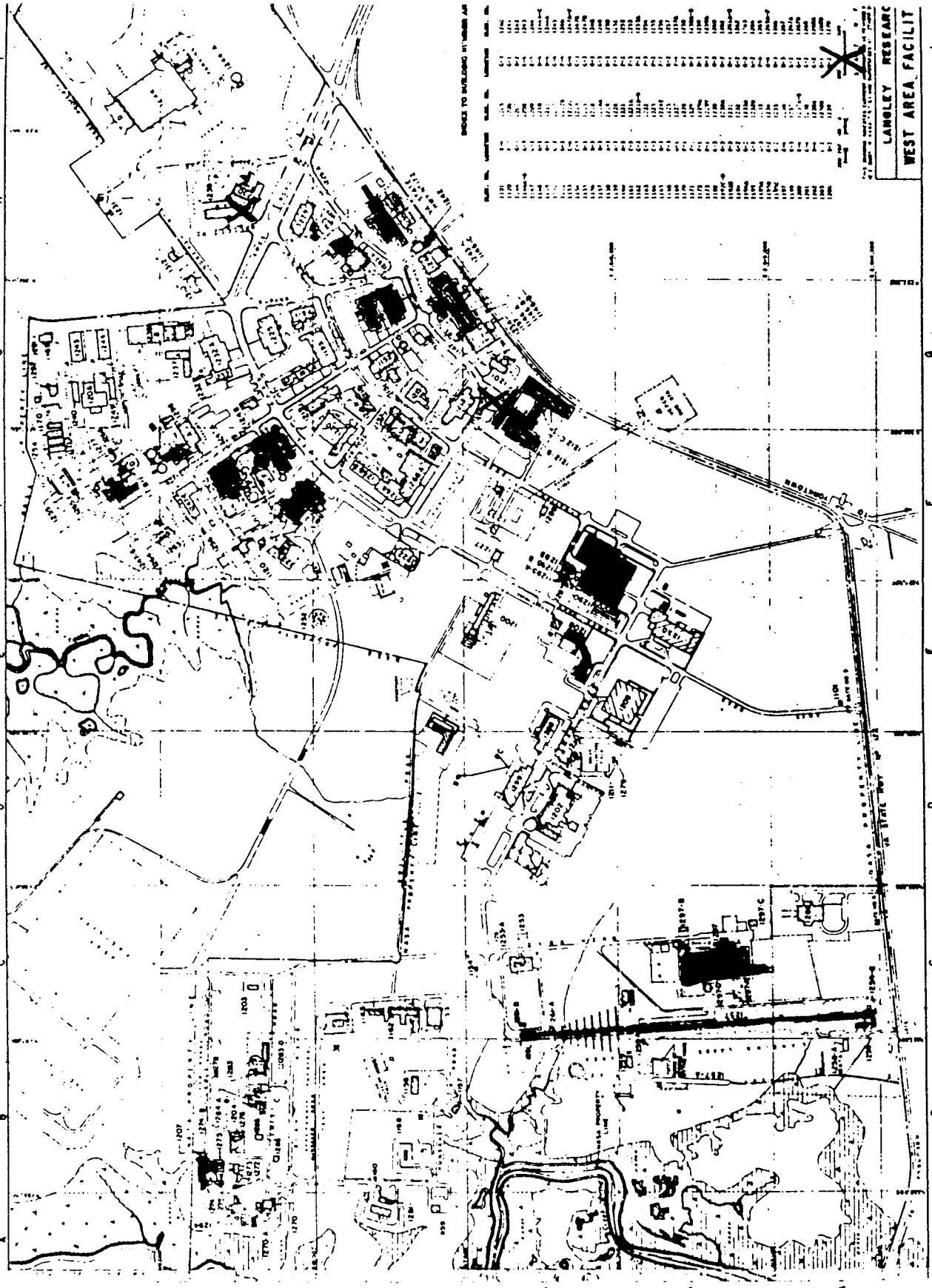
### **DATA SYSTEMS APPLICATIONS AND DESIGN**

- . For hardware that includes:**
  - .. CPU-based systems**
  - .. Workstation-based systems**
  - .. Microprocessor-based systems**
  - .. Custom designed interfaces**

## 2.4 ENGINEERING APPLICATION

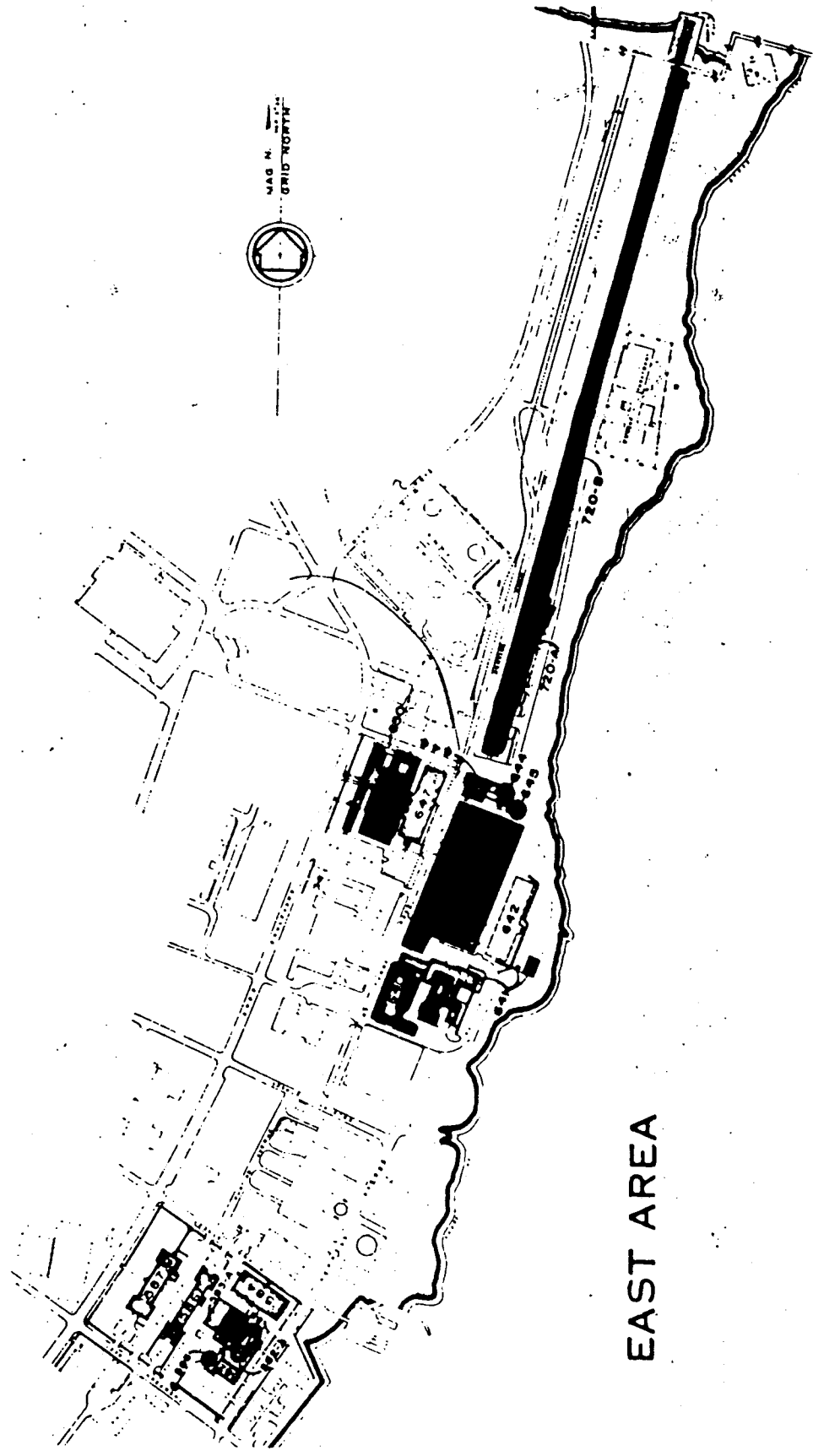
| Facilities    | Acoustical | Measurements | Acceleration       |
|---------------|------------|--------------|--------------------|
| Aeronautical  |            |              | Aerosols           |
| Environmental |            |              | Flow Rate          |
| Materials     |            |              | Flow Visualization |
| Structures    |            |              | Force              |
| Other         |            |              | Noise (Acoustical) |
|               |            |              | Pressure           |
|               |            |              | Strain             |
|               |            |              | Temperature        |
|               |            |              | Other              |

*Hygiene H-7 Research*



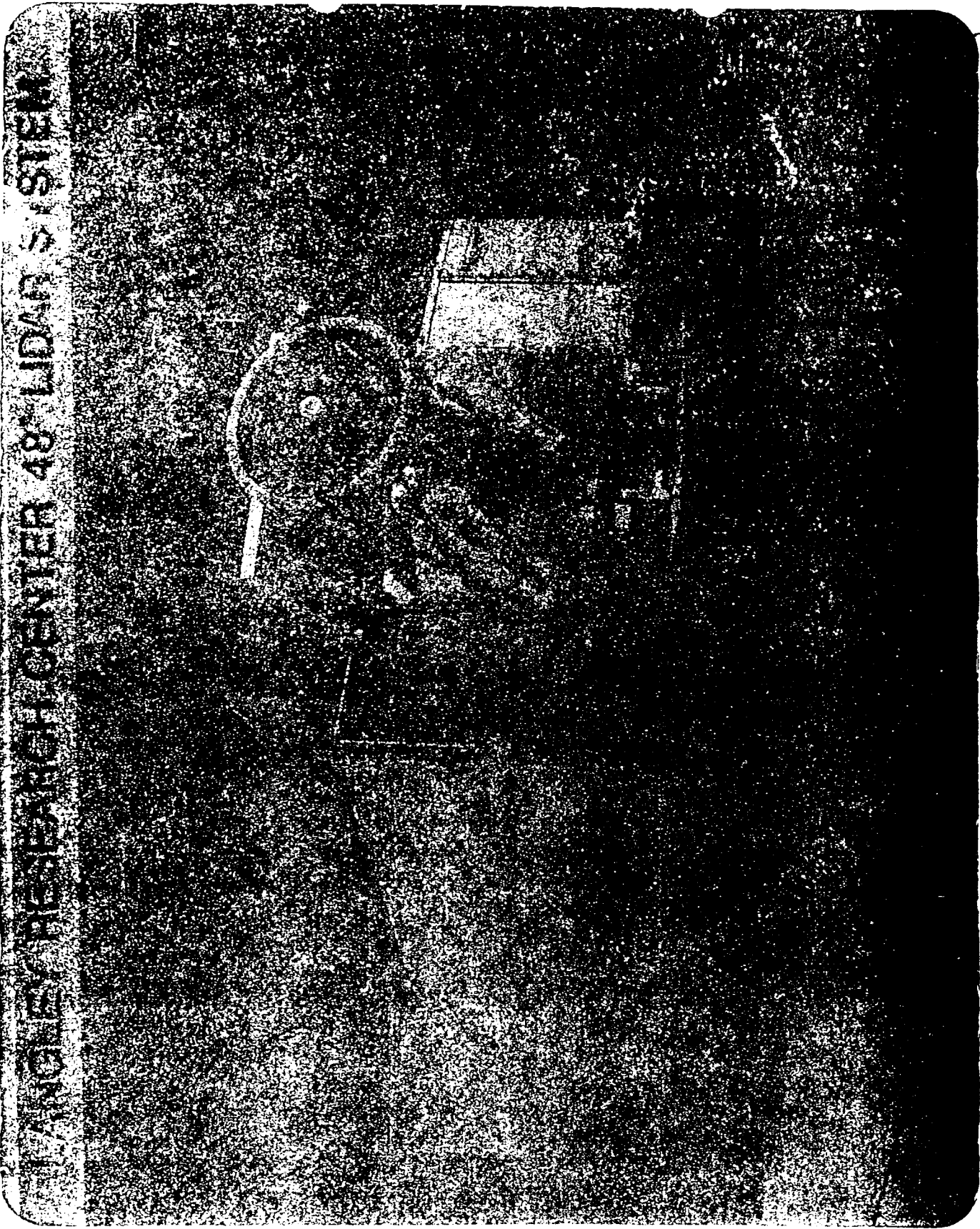
*Major facilities west Area*

*standing airport*



EAST AREA

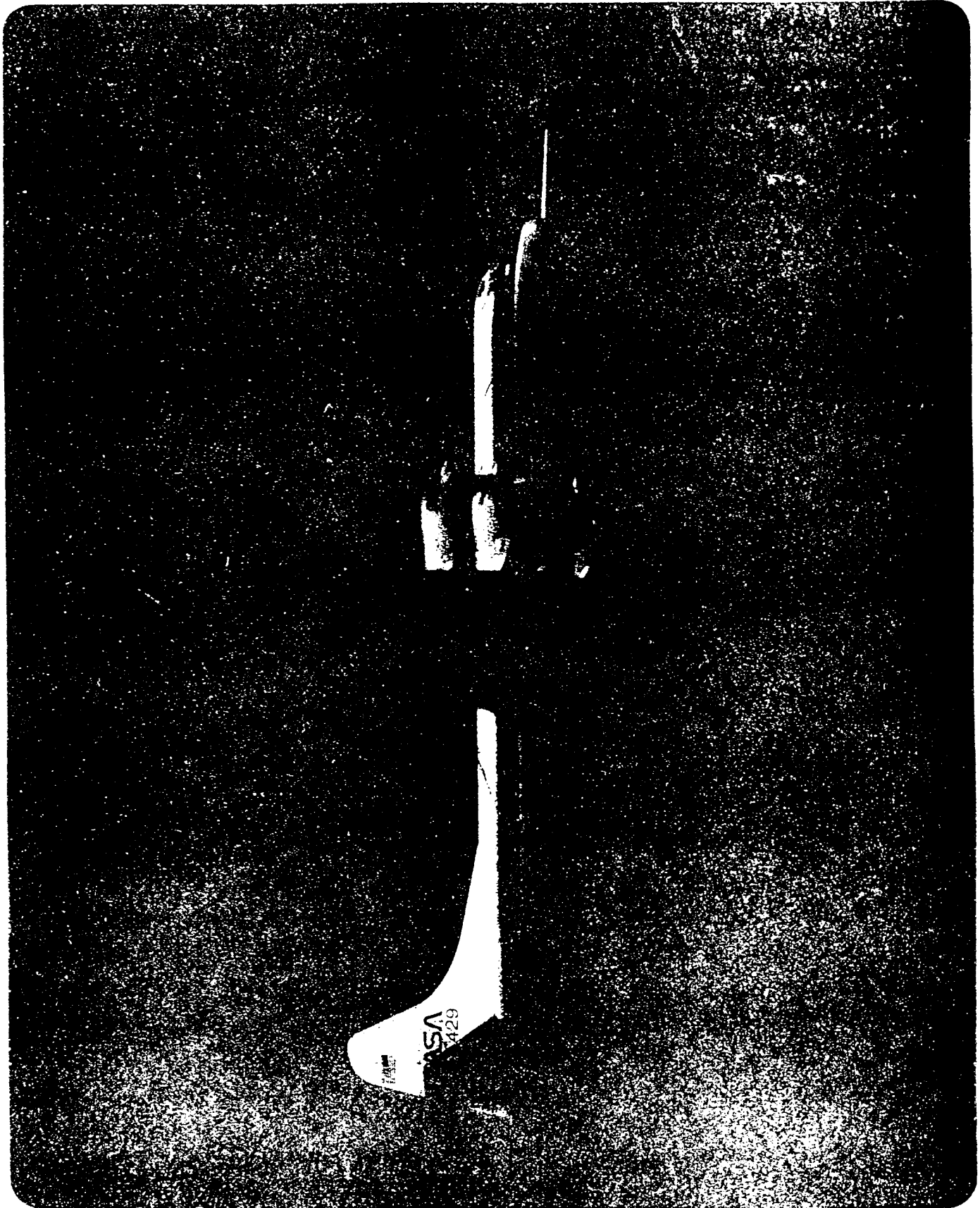
Major facilities  
 East Area  
 — Transition  
 — Vest  
 — Spin  
 — Full scale



LANGLEY RESEARCH CENTER 48" LIDAR SYSTEM

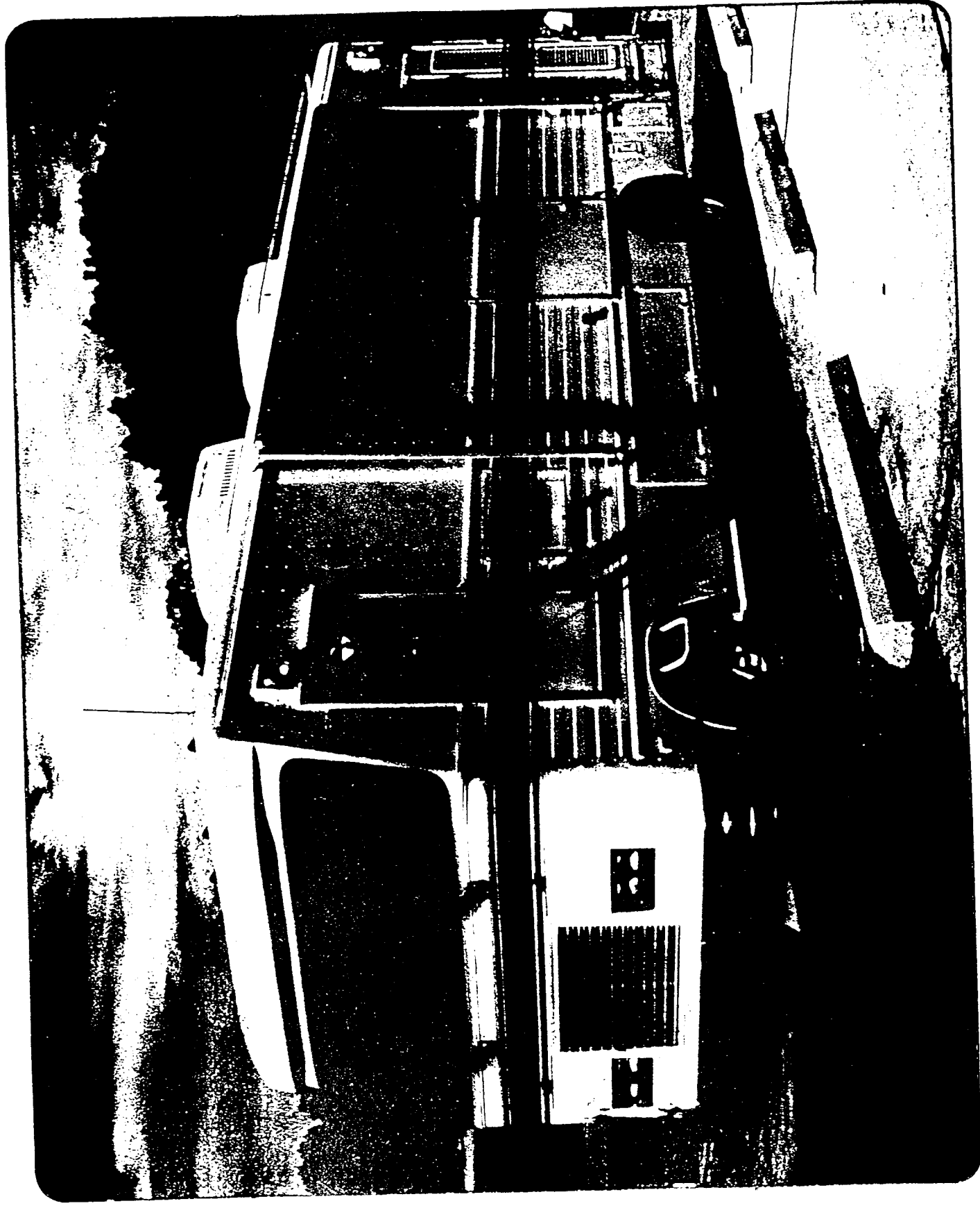
NO

**NASA**  
National Aeronautics and  
Space Administration









the flight was very nice

## **2.5 RECEIPT AND INSPECTION**

**Inspection and verification of instruments, transducers, components, and systems**

**Quantity: 8,000 - 10,000 items/year**

## **2.6 INSTRUMENT POOL**

**Provide on-site support of the day-to-day operation of the LARC instrument loan pool**

**Duties include:**

- Instrument issue (4,500 + loans/year)**
- Instrument accountability management (6,000+ NEMS transactions/year)**
- Equipment recommendations for users**
- NMIS input (50,000+ transactions/year)**
- Optical storage of metrology history**

# GOVERNMENT FURNISHED EQUIPMENT

- 2,856 pieces of test & calibration equipment

- \$5,691,566 capitalized value

- 5 to 8% replacement/year

# SEB EVALUATION PROCEDURES

## Standard Procedure

Review for unacceptable proposals  
Identify strengths, weaknesses  
Initial technical scoring  
Initial evaluation of Cost, Other Factors  
Develop questions  
Establish Competitive Range  
Conduct written and/or oral discussions  
Best and Final Offers Received  
Final Technical scoring  
Final evaluation, Cost and Other Factors  
Prepare, present final report to Selection Official

## Streamlined Procedure

Review for unacceptable proposals  
Identify strengths, weaknesses  
-----  
Review Cost, Other Factors  
Develop questions  
-----  
Conduct written and/or oral discussions  
Best and Final Offers Received  
Technical scoring  
Evaluation of Cost, Other Factors  
Prepare, present Final Report to Selection Official

# SOURCE EVALUATION PROCESS

## Objectives

- Ensure the selection of the source most advantageous to the Government, considering the stated evaluation factors
- Ensure fairness, impartiality, and freedom from outside influence
- Protect any proprietary or confidential information contained in proposals

# **SOURCE EVALUATION PROCESS (CONTINUED)**

## **Responsibilities – Source Evaluation Board**

- Evaluates proposals to determine how well the requirements are fulfilled
- Combines individual judgments into consensus evaluation
- Reports findings to Source Selection Official

## **Responsibilities – Source Selection Official**

- Judges which proposal is most advantageous to the Government, all things considered

**NASA – LANGLEY RESEARCH CENTER**



# SOURCE EVALUATION PROCESS

## CRITERIA

|  | <u>WEIGHTS</u> |
|--|----------------|
| <b>Factor 1</b>  |                |
| <b>Mission Suitability</b>   |                |
| * Phase-in, staffing, continuing personnel management, non-professional comp'n | 20%            |
| * Professional compensation  | 5%             |
| * Operations plan  | 40%            |
| * Organization   | 15%            |
| * Key personnel  | 20%            |
|  | <u>100%</u>    |
| <b>Factor 2</b>  |                |
| <b>Cost</b>  |                |
| <b>Factor 3</b>  |                |
| <b>Relative experience, past performance</b>                                   |                |
| <b>Factor 4</b>  |                |
| <b>Other considerations</b>  |                |
| * Financial condition, capability  |                |
| * Small business, SDB subcontracting   |                |
| * Facility   |                |
| * Contract terms and conditions  |                |

# SOURCE EVALUATION BOARD MEMBERSHIP

## VOTING

Bruce A. Conway, Chairman  
James E. Gardner  
William L. Sellers III  
Robert L. Krieger  
R. Todd Lacks  
James J. Walsh

## NON-VOTING

Nita W. Langford, Recorder

## EX-OFFICIO

Frank Allario  
John T. Bush  
David F. Caplan  
Michael F. Cavelli  
James W. Cresawn  
Rosemary C. Froehlich  
William R. Kivett  
Charles C. Laney  
Sally O. Mauldin  
Robert R. Moore  
Sidney F. Pauls  
John F. Stokes  
Mary J. Yeager

# **SOURCE EVALUATION PROCESS TENTATIVE SCHEDULE**

|                               |                |
|-------------------------------|----------------|
| <b>RFP issuance</b>           | <b>4/27/92</b> |
| <b>Preproposal Conference</b> | <b>5/18/92</b> |
| <b>Proposals Due</b>          | <b>6/11/92</b> |
| <b>Selection</b>              | <b>8/31/92</b> |
| <b>Negotiation</b>            | <b>9/15/92</b> |
| <b>Award</b>                  | <b>9/20/92</b> |
| <b>Contract Start</b>         | <b>10/1/92</b> |

# **CURRENT CONTRACT (NAS1-18552)**

**Contract type:** Cost Plus Award Fee

**Contractor:** Wyle Laboratories  
Scientific Services and  
Systems Group  
3200 Magruder Blvd  
Hampton, VA 23666-1498

**Period of Performance:** Feb 1, 1988 – Sept 30, 1992

**Contract value:** \$46.3 M

ACQUISITION OVERVIEW

REQUIREMENT: INSTRUMENT SUPPORT SERVICES

CONTRACT TYPE: COST-PLUS-AWARD FEE

PERIOD OF PERFORMANCE (POP):

|  |                   |
|--|-------------------|
| INITIAL PERIOD                         | 10/1/92 - 9/30/93 |
| FIRST OPTION PERIOD                    | 10/1/93 - 9/30/94 |
| SECOND OPTION PERIOD                   | 10/1/94 - 9/30/95 |
| THIRD OPTION PERIOD                    | 10/1/95 - 9/30/97 |
| FOURTH THROUGH NINTH<br>OPTION PERIODS | 10/1/97 - 4/30/98 |

MAXIMUM POP SIXTY-SIX (66) MONTHS

# VOLUME II - BUSINESS PROPOSAL

## FACTOR 2 - COST

To Include These Required Forms:

|  | SF-1411   | Form A   | Form B   | Form C   |
|--|-----------|----------|----------|----------|
| 1. Phase-In Cost (If Any)                                  | 1         |          |          |          |
| 2. Initial One-Year Period                                 | 1         | A1       | B1       |          |
| 3. First One-Year Option to Extend                         | 1         | A2       | B2       |          |
| 4. Second One-Year Option to Extend                        | 1         | A3       | B3       |          |
| 5. First Year, Third Two-Year Option to Extend             |           | A4       | B4       |          |
| 6. Second Year, Third Two-Year Option to Extend            |           | A5       | B5       |          |
| 7. Total, Third Two-Year Option to Extend                  | 1         | A6       | B6       |          |
| 8. Total, Initial Period and Options to Extend 1 - 3       | 1         | A7       | B7       |          |
| 9. Fourth Through Ninth One-Month Options to Extend        | 1         | A8       | B8       |          |
| 10. Total, Phase-In, Initial Period, and Options 1 - 9     | 1         | A9       | B9       | C        |
| 11. Options to Increase Level of Effort Within Each Period | * 5       |          |          |          |
| 12. Options to Increase ODC Limitation Per B.3.B           | 1         |          |          |          |
| Totals   | <u>14</u> | <u>9</u> | <u>9</u> | <u>1</u> |

\* Including one SF-1411 for Option Periods Four - Nine Combined

NASA-Provided Spreadsheets MUST be Used for Submission of Forms A - C on Diskette as well as on paper (Spreadsheets Provided on Diskette Upon Request)

## PROPOSAL PREPARATION INSTRUCTIONS

- ARRANGE PROPOSAL IN SEQUENCE, FORMAT, AND CONTENT CONSISTENT WITH ARRANGEMENT OF FACTORS AND ASSOCIATED SUBFACTORS SET FORTH IN ARTICLE M.2 TO FACILITATE EVALUATION.
- ENSURE THAT PROPOSAL CONTAINS ALL NECESSARY INFORMATION AND IS COMPLETE IN ALL RESPECTS. EVALUATION WILL BE BASED UPON MATERIAL PRESENTED AND NOT ON WHAT IS IMPLIED.
- ENSURE CONSISTENCY BETWEEN YOUR COST PROPOSAL AND TECHNICAL/MANAGEMENT PROPOSAL. DISCREPANCIES MAY BE VIEWED AS A LACK OF UNDERSTANDING.

PROPOSAL PREPARATION INSTRUCTIONS

CONTINUED

PROPOSAL SUBMISSION: (REFERENCE L-38,  
PAGE 106)

DUE DATE: CLOSE OF BUSINESS  
(4 P.M.) JUNE 11, 1992

PLACE: NASA, LANGLEY  
RESEARCH CENTER  
BUILDING 1195A, ROOM 103  
HAMPTON, VA 23665-5225

NUMBER OF COPIES:

ORIGINAL AND 15 OF VOLUME I - TECHNICAL/MANAGEMENT PROPOSAL  
ORIGINAL AND 15 OF VOLUME II - BUSINESS PROPOSAL

GOVERNMENT POINT OF CONTACT: R. TODD LACKS  
(804) 864-2477



Enclosure 6

LIST OF REPRESENTATIVE SOFTWARE IN USE AT  
THE CENTER'S NATIONAL TRANSONIC TUNNEL

NTF DATA ACQUISITION SYSTEM (DAS) LIBRARY

| <u>MODULE</u> | <u>FUNCTION</u>                  | <u>LINE#</u> | <u>NOTES</u>                  |
|---------------|----------------------------------|--------------|-------------------------------|
| 1             | DOAP                             | 3000         | FORTRAN                       |
|               | DAS ACQUISITION CONTROL          |              | Some Assembly Language        |
| 2             | DINT                             | 5000         | FORTRAN, Heavy O.S. Dependent |
|               | DAS ACQUISITION INITIALIZATION   |              | Heavy O.S. Dependent          |
| 3             | DAUCAL                           | 2000         | Some Assembly Language        |
|               | NEFF CALIBRATION                 |              |                               |
| 4             | ESPCAL                           | 7800         | FORTRAN, Heavy O.S. Dependent |
|               | ESP CALIBRATION & ACQUISITION    |              |                               |
| 5             | DDIT                             | 3000         | FORTRAN                       |
|               | NEFF ACQUISITION                 |              |                               |
| 6             | TDPDAS                           | 6000         | FORTRAN, Heavy O.S. Dependent |
|               | DAS DISPLAY TASK                 |              |                               |
| 7             | DRTUNL                           | 2000         | FORTRAN                       |
|               | DATA REDUCTION REAL-TIME CONTROL |              |                               |
| 8             | DRDATA                           | 5000         | FORTRAN                       |
|               | DATA REDUCTION INPUT             |              |                               |
| 9             | DASBAL                           | 6000         | FORTRAN                       |
|               | BALANCE EQUATIONS                |              |                               |
| 10            | TSTCKI                           | 9000         | FORTRAN                       |
|               | OPERATOR INTERFACE               |              |                               |
| 11            | SPKIL                            | 50           | FORTRAN, Heavy O.S. Dependent |
|               | DATA POINT MONITOR               |              |                               |
| 12            | IOTI                             | 500          | FORTRAN, Heavy O.S. Dependent |
|               | MAG TAPE DRIVER                  |              |                               |
| 13            | TAPEIO                           | 1500         | FORTRAN, Some O.S. Dependency |
|               | MAG TAPE I/O CONTROL             |              |                               |
| 14            | DRTAPE                           | 2500         | FORTRAN                       |
|               | DATA REDUCTION OFF-LINE CONTROL  |              |                               |
| 15            | SIFTPRINT                        | 1000         | FORTRAN                       |
|               | DATA REDUCTION PRINT PROGRAM     |              |                               |
| 16            | DASSET                           | 4000         | FORTRAN                       |
|               | CDF PROCESSOR                    |              | Mostly Assembly Language      |
| 17            | MODCAM                           | 2000         | FORTRAN                       |
|               | MODACS ACQUISITION               | .....        |                               |
|               | DAS LIBRARY TOTALS               | 60350        |                               |

B-1

NTF DATA MANAGEMENT AND CONTROL (DMC) LIBRARY

| <u>MODULE</u> | <u>FUNCTION</u> | <u>LINES</u> | <u>NOTES</u>                  |
|---------------|-----------------|--------------|-------------------------------|
| 1             | OCI             | 8000         | FORTRAN                       |
| 2             | EGS             | 5000         | FORTRAN                       |
| 3             | CIT             | 4000         | FORTRAN                       |
| 4             | PDITSK          | 3000         | FORTRAN                       |
| 5             | SYSINI          | 400          | FORTRAN, Heavy O.S. Dependent |
|               |                 | .....        |                               |
|               |                 | 20400        | DMC LIBRARY TOTALS            |

NTF PROCESS MONITOR AND CONTROL (PMC) LIBRARY

| <u>MODULE</u> | <u>FUNCTION</u>                        | <u>LINES</u> | <u>NOTES</u> |
|---------------|--|--------------|--------------|
|               | DATA STORAGE FUNCTIONS                 |              |              |
| PMCREC        | DATA MEMORY TRANSFER PROCESS           | 3300         | FORTRAN      |
| RECPMC        | DATA MEMORY TRANSFER TO TAPE           | 3000         | FORTRAN      |
| RCDPLH        | BUFFER UTILITY                         | 100          | FORTRAN      |
| RECOPY        | DATA TRANSFER PROCESS                  | 700          | FORTRAN      |
|               | SEQUENCER RECORDING/PLAYBACK           |              |              |
| PMCSEQ        | SEQUENCER COMMUNICATIONS               | 1000         | FORTRAN      |
| SELECT        | DECODER SELECTION                      | 200          | FORTRAN      |
| SELPMC        | DECODER FUNCTION                       | 1800         | FORTRAN      |
| SELALM        | SEQUENCER ALARM PROCESSOR              | 300          | FORTRAN      |
| SEQDDA        | COMMUNICATION WATCHDOG                 | 200          | FORTRAN      |
| SQRPLY        | REPORT GENERATION                      | 5700         | FORTRAN      |
|               | PROCESS DATA ACQUISITION               |              |              |
| PMCMOD        | MODAC ANNUNCIATORS AND TEST DIR. PANEL | 400          | FORTRAN      |
| PMCDAU        | PMCNFF SCAN TASK                       | 3200         | FORTRAN      |
| MICCOM        | MICROPROCESSOR COMMUNICATION           | 900          | FORTRAN      |
| WCMON         | WARMUP/COOLDOWN PROCESS FUNCTION       | 700          | FORTRAN      |
| TPDG          | TEST DIRECTION                         | 200          | FORTRAN      |
| TMSCAN        | TEMPERATURE MONITOR SCANNER COMM       | 700          | FORTRAN      |
| MICINF        | MICRO INITIALIZATION                   | 200          | FORTRAN      |
| MICSEN        | BONDS MICRO COMM. BLOCKS               | 100          | FORTRAN      |
| SEQ40M        | MICRO-TO-SEQUENCER COMM. TASK          | 400          | FORTRAN      |
| RMACH         | RESEARCH MACH NO. CONTROL              |              |              |
|               | PROCESS DATA SUMMARY                   |              |              |
| PDS           | TUNNEL ACTIVITY SUMMARY                | 6600         | FORTRAN      |
| PDSDUP        | DUPLICATES IDS TAPES                   | 100          | FORTRAN      |
| PDSINI        | INITIALIZES PDS TASKS                  | 40           | FORTRAN      |
| PDSRDT        | PDS REPORT GENERATOR                   | 300          | FORTRAN      |
| PDSULD        | VERIFIES PROCESS TASKS                 | 800          | FORTRAN      |

NTF PROCESS MONITOR AND CONTROL (PMC) LIBRARY  
(CONTINUED)

| <u>MODULE</u> | <u>FUNCTION</u>                         | <u>LINES</u> | <u>NOTES</u> |
|---------------|---|--------------|--------------|
| PMCDRV        | PROCESS DATA REDUCTION                  | 1000         | FORTTRAN     |
| NAPUSE        | ON-LINE DATA REDUCTION                  | 400          | FORTTRAN     |
| FANDRV        | CALCULATES CONSUMABLES USAGE            | 1100         | FORTTRAN     |
| NAPACT        | CALCULATES FAN DRIVE SYSTEM PERFORMANCE | 200          | FORTTRAN     |
| NAPTIM        | ACTIVATES NAPUSE TASK                   | 200          | FORTTRAN     |
| TABBLD        | CATALOGS CONSUMABLES TOTALS             | 1300         | FORTTRAN     |
|               | BUILDS SEQUENCER PLAYBACK TABLES        |              |              |
| MSTRT1        | MENU/GRAPHICS PRESENTATION              | 500          | FORTTRAN     |
| CUP           | RUNTIME MENU SYSTEM                     | 2500         | FORTTRAN     |
| SDP           | ONLINE GRAPHICS PROCESSOR               | 3000         | FORTTRAN     |
| PDPPLT        | SCHEMATIC DISPLAY PROCESSOR             | 2200         | FORTTRAN     |
| PDPREP        | PLOTS PROCESS DATA                      | 6000         | FORTTRAN     |
| PDPVER        | PRODUCES PROCESS DATA HARDCOPY REPORTS  | 500          | FORTTRAN     |
| TDPGAM        | MAINTAINS PDPREP FILES                  | 1700         | FORTTRAN     |
| TDPPMC        | OFFLINE MAINTENANCE PROCESSOR           | 1100         | FORTTRAN     |
| TDMSAL        | GRAPHICS PROCESSOR WATCHDOG             | 1900         | FORTTRAN     |
| PMCDUMP       | STAND ALONE TEST DIRECTOR MENU SYSTEM   | 1200         | FORTTRAN     |
|               | DATA DUMP PROCESSOR                     |              |              |
| RESCTL        | ALERT PROCESSOR/DATA BASE               | 2700         | FORTTRAN     |
| RESDDA        | TEST DIRECTOR RESPONSE SYSTEM           | 300          | FORTTRAN     |
| RESINI        | DISPLAYS RESPONSE RECORDS               | 100          | FORTTRAN     |
| APSPMC        | INITIALIZES RESPONSE DATA BASE          | 300          | FORTTRAN     |
| ALERT PROC    | PMS ALERT DETECTOR                      | 3000         | FORTTRAN     |
|               | ERROR ALERT ANNUNCIATOR                 |              |              |
| DDA           | DATA DICTIONARY FUNCTION                | 100          | FORTTRAN     |
| DDMCTL        | DATA DICTIONARY MAINTENANCE PROCESSOR   | 8200         | FORTTRAN     |
| DDMDIA        | DATA DICTIONARY CONTROL                 | 100          | FORTTRAN     |
| DDMINI        | DATA DICTIONARY DIAGNOSTIC              | 300          | FORTTRAN     |
| DDMINT        | DATA DICTIONARY INITIALIZER             | 200          | FORTTRAN     |
| DIX           | DATA DICTIONARY PARTIAL INITIALIZER     | 400          | FORTTRAN     |
| LDIX          | DATA DICTIONARY CROSS REFERENCE         | 200          | FORTTRAN     |
| OPRDEF        | DATA DICTIONARY CROSS REFERENCE (ABREV) | 4800         | FORTTRAN     |
| TDEDIT        | OPERATIONS DEFINITION PROCESSOR         | 3200         | FORTTRAN     |
|               | BUILDS POLARS FILE                      |              |              |

NTF PROCESS MONITOR AND CONTROL (PMC) LIBRARY  
(CONTINUED)

| <u>MODULE</u> | <u>FUNCTION</u>                    | <u>LINES</u> | <u>NOTES</u>       |
|---------------|------------------------------------|--------------|--------------------|
|               | MICROPROCESSOR DIAGNOSTICS         |              |                    |
| TPD1          | OFFLINE MICROPROCESSOR DIAGNOSTIC  | 200          | FORTRAN            |
| TPD2          | OFFLINE MICROPROCESSOR DIAGNOSTIC  | 400          | FORTRAN            |
| TPD3          | OFFLINE MICROPROCESSOR DIAGNOSTIC  | 300          | FORTRAN            |
| TPD4          | OFFLINE MICROPROCESSOR DIAGNOSTIC  | 700          | FORTRAN            |
| TPD5          | OFFLINE MICROPROCESSOR DIAGNOSTIC  | 700          | FORTRAN            |
|               | TUNNEL PARAMETERS CONTROL          |              |                    |
| TCPINI        | INITIALIZES TPC PROCESS            | 300          | FORTRAN            |
| TPCOCI        | TPC OPERATOR INTERFACE TASK        | 700          | FORTRAN            |
| TPCSTO        | TPC TERMINATE                      | 400          | FORTRAN            |
| TPCTER        | TPC TERMINATES                     | 500          | FORTRAN            |
| PRDATA        | ACQUIRES SELECTED DATA             | 400          | FORTRAN            |
| BPDUMP        | SAFETY CHANNELS DATA DUMP          | 800          | FORTRAN            |
| SALINI        | STAND ALONE TPC TASK INITIALIZES   | 400          | FORTRAN            |
| SALOCI        | STAND ALONE TPC OPERATOR INTERFACE | 1000         | FORTRAN            |
|               |                                    | -----        |                    |
|               |                                    | 87140        | PMC LIBRARY TOTALS |

# IRD DATA ACQUISITION SOFTWARE LIBRARY

| <u>MODULE</u> | <u>FUNCTION</u>           | <u>LINES</u> | <u>NOTES</u>       |
|---------------|---------------------------|--------------|--------------------|
| 1             | N6CAL                     | 3,100        | SOME O/S DEPENDENT |
| 2             | PSICAL                    | 1,475        | SOME O/S DEPENDENT |
| 3             | SCAN/EPP                  | 5,100        |                    |
| 4             | STATUS                    | 1,355        | SOME O/S DEPENDENT |
| 5             | CRUDFS                    | 4,556        | SOME O/S DEPENDENT |
| 6             | IOPWDR                    | 5,348        | SOME O/S DEPENDENT |
| 7             | NEFTSK                    | 3,300        |                    |
| 8             | LED                       | 6,103        |                    |
| 9             | LISTDT                    | 2,428        |                    |
| 10            | MENU                      | 1,217        | SOME O/S DEPENDENT |
| 11            | LEAKCH                    | 7,177        |                    |
| 12            | DCPNSW/<br>DSPNHW/<br>DCP | 4,200        |                    |
| 13            | DTS/LMP                   | 4,520        | SOME O/S DEPENDENT |
| 14            | OAP                       | 1,200        | SOME O/S DEPENDENT |
| 15            | OUTPUT                    | 2,388        |                    |
| 16            | SCVPSW/<br>SCVPHW<br>SCP  | 1,500        | SOME O/S DEPENDENT |
| 17            | CONSIG                    | 902          |                    |
| 18            | USELIB                    | 10,742       | SOME ASSEMBLY      |

IRD DATA ACQUISITION SOFTWARE LIBRARY  
(CONTINUED)

| <u>MODULE</u> | <u>FUNCTION</u> | <u>LINES</u> | <u>NOTES</u>       |
|---------------|-----------------|--------------|--------------------|
| 19            | PAGES           | 700          |                    |
| 20            | RIDOAP          | 225          |                    |
| 21            | ZAPPER          | 300          | 538 LINES ASSEMBLY |
| 22            | ESPSCN          | 538          |                    |
| 23            | ESPPRO          | 1,100        | SOME O/S DEPENDENT |
| 24            | DSKMTR          | 1,913        |                    |
| 25            | UTLLIB          | 5,050        |                    |
| 26            | SYSLIB          | 8,744        |                    |
|               |                 | -----        |                    |
|               |                 | 83,081       | DAS LIBRARY TOTALS |



# IRD REAL-TIME APPLICATIONS LIBRARY

| <u>MODULE</u> | <u>FUNCTION</u> | <u>SUBROUTINES</u> | <u>LINES</u> | <u>NOTES</u>                                  |
|---------------|-----------------|--------------------|--------------|---|
| 1             | OPRTP           | 27                 | 7,052        | 500 LINES ASSEMBLY                            |
| 2             | PHASE2          | 72                 | 15,311       | OPERATING SYSTEM<br>DEPENDENT CODE            |
| 3             | REPORT          | 18                 | 5,172        | SOME OPERATING SYSTEM<br>DEPENDENT CODE       |
| 4             | TCOMP           | 50                 | 20,083       |   |
| 5             | TCYCL           | 23                 | 4,775        |   |
| 6             | TPOINT          | 27                 | 2,925        | SOME OPERATING SYSTEM<br>DEPENDENT CODE       |
| 7             | XDCAL           | 14                 | 2,484        | SOME OPERATING SYSTEM<br>DEPENDENT CODE       |
| 8             | PLPLOT          | 63                 | 11,554       |   |
| 9             | WTARE           | 16                 | 5,197        |   |
| 10            | TPDUMP          | 6                  | 1,232        |   |
| 11            | RSAVO           | 20                 | 1,927        | SOME OPERATING SYSTEM<br>DEPENDENT CODE       |
| 12            | RKCYCL          | 5                  | 5,440        |   |
| 13            | UPWT            | 122                | 14,016       | 227 LINES ASSEMBLY<br>SOME O/S DEPENDENT CODE |
| 14            | BARGRAPH        | 17                 | 4,130        | ISC GRAPHICS PACKAGE                          |
| 15            | HPDRV           | 30                 | 1,970        | 170 LINES ASSEMBLY<br>DEV. DEPENDENT CODE     |
|               |                 | 488                | 121,026      | RTP LIBRARY TOTALS                            |

# IRD CONFIGURATION CONTROL PROCEDURES LIBRARY

| <u>MODULE</u> | <u>FUNCTION</u>  | <u>SUBROUTINES</u> | <u>LINES</u> | <u>NOTES</u>   |
|---------------|--|--------------------|--------------|--|
| 1             | TREE<br>DIAGRAMS OVERLAY STRUCTURE AND<br>SEGMENTATION MAP FOR REAL-TIME TASKS   | 70                 | 5,171        | HEAVILY O/S DEPENDENT<br>OBJECT MODULE ANALYZER                        |
| 2             | BINARY<br>COMPARES BINARY OBJECT MODULES AND<br>PRINTS DIFFERENCES, ETC.   | --                 | 1,200        | HEAVILY O/S DEPENDENT<br>BINARY MODULE ANALYZER                        |
| 3             | OAPCTL<br>CONFIGURATION CONTROL PROCEDURES<br>AND UTILITIES FOR BUILDING, DISTRIBUTING<br>AND MAINTAINING DATA ACQUISITION SOFTWARE                            | --                 | 5,500        | HEAVILY O/S DEPENDENT<br>WITH JOB CONTROL                              |
| 4             | RTPCL<br>CONFIGURATION CONTROL PROCEDURES<br>AND UTILITIES FOR BUILDING<br>DISTRIBUTING, AND MAINTAINING   | --                 | 1,300        | HEAVILY O/S DEPENDENT<br>WITH JOB CONTROL<br>LANGUAGE                  |
| 5             | OSCTL<br>CONFIGURATION CONTROL PROCEDURES<br>AND UTILITIES FOR BUILDING,<br>DISTRIBUTING, AND MAINTAINING<br>OPERATING SYSTEM SOFTWARE                         | --                 | 700          | HEAVILY O/S DEPENDENT<br>WITH JOB CONTROL AND<br>FILE MANAGER LANGUAGE |
| 6*            | PC WORK-<br>STATION<br>NETWORK SOFTWARE TO LINK IBM PC'S TO<br>MODCOMPS. USED FOR CONFIGURATION<br>CONTROL, CONTRACT MONITORING AND<br>SCIENTIFIC APPLICATIONS | --                 | 5,000        | CUSTOM DRIVERS HEAVILY<br>O/S DEPENDENT                                |
| 7             | O/S MODS<br>MODIFICATIONS TO OPERATING SYSTEM<br>TO SHARE PRINTERS, TERMINAL EDITING,<br>NETWORKS, ETC.  | --                 | 5,700        | HEAVILY IN ASSEMBLY<br>LANGUAGE<br>O/S DEPENDENT                       |
| 8*            | VISION<br>REAL-TIME TASK AND SYSTEM<br>PERFORMANCE ANALYZER  | --                 | 5,000        | HEAVY IN ASSEMBLY<br>LANGUAGE<br>O/S DEPENDENT                         |
|               |  | ----               | -----        | CONFIGURATION CONTROL<br>LIBRARY TOTALS                                |
|               |  | 70                 | 29,571       |  |

IRD HARDWARE DIAGNOSTICS LIBRARY FOR SPECIAL INTERFACES

| <u>MODULE</u> | <u>FUNCTION</u> | <u>SUBROUTINES</u> | <u>LINES</u> | <u>NOTES</u>                                 |
|---------------|-----------------|--------------------|--------------|--|
| 1             | NEFF 600        | 46                 | 3,000        | 600 ASSEMBLER LINES<br>HEAVILY O/S DEPENDENT |
| 2             | NEFF 200        | 14                 | 5,664        | HEAVILY O/S DEPENDENT<br>CUSTOM INTERFACE    |
| 3             | MODAC           | 21                 | 4,535        | HEAVILY O/S DEPENDENT<br>SPECIAL I/O DEVICES |
| 4             | PCAL            | 6                  | 1,000        | OPERATING SYSTEM DEPENDENT                   |
| 5             | VIO             | 18                 | 2,300        |  |
| 6             | TEK             | 6                  | 1,000        |  |
| 7             | HISTO           | 4                  | 600          |  |
|               |                 | 115                | 18,100       | DIAGNOSTICS LIBRARY TOTALS                   |

2. AMENDMENT/MODIFICATION NO. 1  
 3. EFFECTIVE DATE  
 4. REQUISITION/PURCHASE REQ. NO.  
 5. PROJECT NO. (If applicable)  
 6. ISSUED BY CODE  
 National Aeronautics and Space Administration  
 Langley Research Center  
 Hampton, VA 23665-5225  
 7. ADMINISTERED BY (If other than Item 6) CODE

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code)  
 TO ALL CONCERNED  
 9A. AMENDMENT OF SOLICITATION NO. 1-39-1270.0267  
 9B. DATED (SEE ITEM 11) 4/27/92  
 10A. MODIFICATION OF CONTRACT/ORDER NO.  
 10B. DATED (SEE ITEM 13)  
 CODE FACILITY CODE

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers  is extended,  is not extended.

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods:  
 (a) By completing Items 8 and 15, and returning 1 copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required)

13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

(v) A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.  
 B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).  
 C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:  
 D. OTHER (Specify type of modification and authority)

E. IMPORTANT: Contractor  is not,  is required to sign this document and return \_\_\_\_\_ copies to the issuing office.


14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)

Subject: RFP No. 1-39-1270.0267 for Instrument Support Services

The purpose of this amendment is to make revisions to the subject RFP as follows:

(CONTINUED ON ATTACHED PAGE)

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER (Type or print)  
 16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)  
 W. R. KIVETT  
 15B. CONTRACTOR/OFFEROR  
 15C. DATE SIGNED  
 16B. UNITED STATES OF AMERICA  
 BY  (Signature of Contracting Officer)  
 16C. DATE SIGNED 5-11-92  
 (Signature of person authorized to sign)

I. B.2, Level of Effort, Paragraph A. (Ref. Page 2) is revised to read as follows:

"A. In performing Government assigned work orders under this contract and the on-going services outlined in Tasks 2.5 and 2.6 of the Statement of Work, the Contractor is obligated to provide up to 391,125 direct productive labor hours (including those hours associated with subcontracts or teaming arrangements) as defined in Paragraph C. below."

II. I.2, FAR Clause 52.225-13, Restrictions on Contracting with Sanctioned Persons (APR 1991) is hereby deleted from the RFP (Ref. Page 24).

III. K.17, Notice of Restrictions on Contracting with Sanctioned Persons (FAR 52.225-12) (APR 1991), is hereby deleted from the RFP (Ref. Page 90).

IV. M.2.D, Factor 4 - Other Considerations, paragraph entitled, "Subfactor 4 - Contract Terms and Conditions" (Ref. Pages 121 and 122), the last sentence on Page 122 is revised to read as follows:

"The offeror's rationale for and the acceptability of any exceptions will be evaluated."

V. Attachment 5, Cost Proposal Forms A through C, a revised Form B1 (Ref. Page 215) is included as an enclosure to this amendment.

DIRECT LEVEL-OF-EFFORT LABOR COSTS

Solicitation 1-39-1270.0267  
 Instrument Support Services  
 Proposer \_\_\_\_\_

Initial Contract Oct. 1, 1992 Through Sep. 30, 1993

|   | Straight-<br>Time<br>Hours | Over-<br>Time<br>Hours | Straight-<br>Time<br>Rate | Straight-<br>Time<br>Costs | Overtime<br>Costs Excl.<br>Premium | Overtime<br>Premium<br>Costs | Total<br>Costs |
|---|----------------------------|------------------------|---------------------------|----------------------------|------------------------------------|------------------------------|----------------|
|   |                            |                        |                           |                            |                                    |                              |                |
| Pressure/Flow Calibration Engineer          |                            |                        |                           |                            |                                    |                              |                |
| Metrology/Motion Calibration Engineer       |                            |                        |                           |                            |                                    |                              |                |
| Electric/Electronic/Temp. Calibr. Engineer  |                            |                        |                           |                            |                                    |                              |                |
| Field Application Engineer                  |                            |                        |                           |                            |                                    |                              |                |
| Acoustical Systems Engineer                 |                            |                        |                           |                            |                                    |                              |                |
| Digital Systems Maintenance Engineer        |                            |                        |                           |                            |                                    |                              |                |
| Laser Optics Engineer                       |                            |                        |                           |                            |                                    |                              |                |
| Instrument Calibration Aide                 |                            |                        |                           |                            |                                    |                              |                |
| Calibration Engineering Technician          |                            |                        |                           |                            |                                    |                              |                |
| Electronic Technician                       |                            |                        |                           |                            |                                    |                              |                |
| Experimental Electronics Mechanic           |                            |                        |                           |                            |                                    |                              |                |
| Camera Repair Mechanic                      |                            |                        |                           |                            |                                    |                              |                |
| Engineering Technician                      |                            |                        |                           |                            |                                    |                              |                |
| Machinist                                   |                            |                        |                           |                            |                                    |                              |                |
| Digital Systems Hardware Engineer           |                            |                        |                           |                            |                                    |                              |                |
| Systems Analyst/Programmer                  |                            |                        |                           |                            |                                    |                              |                |
| Engineering Draftsman                       |                            |                        |                           |                            |                                    |                              |                |
| Technical Editor                            |                            |                        |                           |                            |                                    |                              |                |
| Technical Typist                            |                            |                        |                           |                            |                                    |                              |                |
| Electronic Technician (Instr. Contr./Appl.) |                            |                        |                           |                            |                                    |                              |                |
| Instrument Control Clerk                    |                            |                        |                           |                            |                                    |                              |                |
| Production Control Supervisor               |                            |                        |                           |                            |                                    |                              |                |
| Shipping/Receiving Clerk                    |                            |                        |                           |                            |                                    |                              |                |
| Clerk- Typist                               |                            |                        |                           |                            |                                    |                              |                |
| Data Entry Clerk                            |                            |                        |                           |                            |                                    |                              |                |
| Equipment Handler/Driver                    |                            |                        |                           |                            |                                    |                              |                |
| Other (Specify)                             |                            |                        |                           |                            |                                    |                              |                |
| TOTAL DIRECT LOE HOURS/DOLLARS              |                            |                        |                           |                            |                                    |                              |                |

|   |  |                   |   |  |                                |
|---|--|-------------------|---|--|--------------------------------|
| <b>AMENDMENT OF SOLICITATION / MODIFICATION OF CONTRACT</b>   |  |                   |   | 1. CONTRACT ID CODE  | PAGE OF PAGES<br>1   2         |
| 2. AMENDMENT/MODIFICATION NO.<br><u>1</u>   |  | 3. EFFECTIVE DATE | 4. REQUISITION/PURCHASE REQ. NO.          |  | 5. PROJECT NO. (If applicable) |
| 6. ISSUED BY<br>National Aeronautics and Space Administration<br>Langley Research Center<br>Hampton, VA 23665-5225  |  | CODE              | 7. ADMINISTERED BY (If other than Item 6) |  | CODE                           |
| 8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code)<br><br><b>TO ALL CONCERNED</b>  |  |                   | (W)                                       | 9A. AMENDMENT OF SOLICITATION NO.<br><b>1-39-1270.0267</b> |                                |
|   |  |                   | X   | 9B. DATED (SEE ITEM 11)<br><b>4/27/92</b>                  |                                |
|   |  |                   |   | 10A. MODIFICATION OF CONTRACT/ORDER NO.                    |                                |
|   |  |                   |   | 10B. DATED (SEE ITEM 13)                                   |                                |
| CODE  |  | FACILITY CODE     |   |  |                                |
| <b>11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS</b>  |  |                   |   |  |                                |
| <input checked="" type="checkbox"/> The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers <input type="checkbox"/> is extended, <input checked="" type="checkbox"/> is not extended.  |  |                   |   |  |                                |
| Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods:<br>(a) By completing Items 8 and 15, and returning <u>1</u> copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified. |  |                   |   |  |                                |
| 12. ACCOUNTING AND APPROPRIATION DATA (If required)   |  |                   |   |  |                                |

**13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.**

|     |   |
|-----|---|
| (W) | A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.  |
|     | B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b). |
|     | C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:  |
|     | D. OTHER (Specify type of modification and authority)   |

E. IMPORTANT: Contractor  is not,  is required to sign this document and return \_\_\_\_\_ copies to the issuing office.


14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)

Subject: RFP No. 1-39-1270.0267 for Instrument Support Services

The purpose of this amendment is to make revisions to the subject RFP as follows:

(CONTINUED ON ATTACHED PAGE)

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

|   |  |  |   |
|---|--|--|---|
| 15A. NAME AND TITLE OF SIGNER (Type or print) |  | 16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) |   |
|   |  | W. R. KIVETT   |   |
| 15B. CONTRACTOR/OFFEROR                       |  | 15C. DATE SIGNED   | 16B. UNITED STATES OF AMERICA   |
| (Signature of person authorized to sign)      |  |  | BY <br>(Signature of Contracting Officer) |
|   |  |  | 16C. DATE SIGNED<br><b>5-11-92</b>  |

I. B.2, Level of Effort, Paragraph A. (Ref. Page 2) is revised to read as follows:

"A. In performing Government assigned work orders under this contract and the on-going services outlined in Tasks 2.5 and 2.6 of the Statement of Work, the Contractor is obligated to provide up to 391,125 direct productive labor hours (including those hours associated with subcontracts or teaming arrangements) as defined in Paragraph C. below."

II. I.2, FAR Clause 52.225-13, Restrictions on Contracting with Sanctioned Persons (APR 1991) is hereby deleted from the RFP (Ref. Page 24).

III. K.17, Notice of Restrictions on Contracting with Sanctioned Persons (FAR 52.225-12) (APR 1991), is hereby deleted from the RFP (Ref. Page 90).

IV. M.2.D, Factor 4 - Other Considerations, paragraph entitled, "Subfactor 4 - Contract Terms and Conditions" (Ref. Pages 121 and 122), the last sentence on Page 122 is revised to read as follows:

"The offeror's rationale for and the acceptability of any exceptions will be evaluated."

V. Attachment 5, Cost Proposal Forms A through C, a revised Form B1 (Ref. Page 215) is included as an enclosure to this amendment.



DIRECT LEVEL-OF-EFFORT LABOR COSTS

Solicitation 1-39-1270.0267

Instrument Support Services

Proposer \_\_\_\_\_

Initial Contract Oct. 1, 1992 Through Sep. 30, 1993

|   | Straight-Time Hours | Over-Time Hours | Straight-Time Rate | Straight-Time Costs | Overtime Costs Excl. Premium | Overtime Premium Costs | Total Costs |
|---|---------------------|-----------------|--------------------|---------------------|------------------------------|------------------------|-------------|
| Pressure/Flow Calibration Engineer          |                     |                 |                    |                     |                              |                        |             |
| Metrology/Motion Calibration Engineer       |                     |                 |                    |                     |                              |                        |             |
| Electric/Electronic/Temp. Calibr. Engineer  |                     |                 |                    |                     |                              |                        |             |
| Field Application Engineer                  |                     |                 |                    |                     |                              |                        |             |
| Acoustical Systems Engineer                 |                     |                 |                    |                     |                              |                        |             |
| Digital Systems Maintenance Engineer        |                     |                 |                    |                     |                              |                        |             |
| Laser Optics Engineer                       |                     |                 |                    |                     |                              |                        |             |
| Instrument Calibration Aide                 |                     |                 |                    |                     |                              |                        |             |
| Calibration Engineering Technician          |                     |                 |                    |                     |                              |                        |             |
| Electronic Technician                       |                     |                 |                    |                     |                              |                        |             |
| Experimental Electronics Mechanic           |                     |                 |                    |                     |                              |                        |             |
| Camera Repair Mechanic                      |                     |                 |                    |                     |                              |                        |             |
| Engineering Technician                      |                     |                 |                    |                     |                              |                        |             |
| Machinist                                   |                     |                 |                    |                     |                              |                        |             |
| Digital Systems Hardware Engineer           |                     |                 |                    |                     |                              |                        |             |
| Systems Analyst/Programmer                  |                     |                 |                    |                     |                              |                        |             |
| Engineering Draftsman                       |                     |                 |                    |                     |                              |                        |             |
| Technical Editor                            |                     |                 |                    |                     |                              |                        |             |
| Technical Typist                            |                     |                 |                    |                     |                              |                        |             |
| Electronic Technician (Instr. Contr./Appl.) |                     |                 |                    |                     |                              |                        |             |
| Instrument Control Clerk                    |                     |                 |                    |                     |                              |                        |             |
| Production Control Supervisor               |                     |                 |                    |                     |                              |                        |             |
| Shipping/Receiving Clerk                    |                     |                 |                    |                     |                              |                        |             |
| Clerk-Typist                                |                     |                 |                    |                     |                              |                        |             |
| Data Entry Clerk                            |                     |                 |                    |                     |                              |                        |             |
| Equipment Handler/Driver                    |                     |                 |                    |                     |                              |                        |             |
| Other (Specify)                             |                     |                 |                    |                     |                              |                        |             |
| TOTAL DIRECT LOE HOURS/DOLLARS              |                     |                 |                    |                     |                              |                        |             |

AMENDMENT OF SOLICITATION / MODIFICATION OF CONTRACT

1. CONTRACT ID CODE

PAGE OF PAGES

1 | 2

|  |                   |   |                                |
|--|-------------------|---|--------------------------------|
| 2. AMENDMENT/MODIFICATION NO.<br><u>1</u>  | 3. EFFECTIVE DATE | 4. REQUISITION/PURCHASE REQ. NO.          | 5. PROJECT NO. (If applicable) |
| 6. ISSUED BY<br>National Aeronautics and Space Administration<br>Langley Research Center<br>Hampton, VA 23665-5225 | CODE              | 7. ADMINISTERED BY (If other than Item 6) | CODE                           |

|   |               |  |
|---|---------------|--|
| 8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code)<br><br>TO ALL CONCERNED | (V)           | 9A. AMENDMENT OF SOLICITATION NO.<br><u>1-39-1270.0267</u> |
|   | X             | 9B. DATED (SEE ITEM 11)<br><u>4/27/92</u>                  |
|   |               | 10A. MODIFICATION OF CONTRACT/ORDER NO.                    |
|   |               | 10B. DATED (SEE ITEM 13)                                   |
| CODE  | FACILITY CODE |  |

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers  is extended,  is not extended.

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods:  
 (a) By completing Items 8 and 15, and returning 1 copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required)

13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

|     |   |
|-----|---|
| (V) | A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.  |
|     | B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b). |
|     | C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:  |
|     | D. OTHER (Specify type of modification and authority)   |

E. IMPORTANT: Contractor  is not,  is required to sign this document and return \_\_\_\_\_ copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)

Subject: RFP No. 1-39-1270.0267 for Instrument Support Services

The purpose of this amendment is to make revisions to the subject RFP as follows:

(CONTINUED ON ATTACHED PAGE)

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

|  |   |
|--|---|
| 15A. NAME AND TITLE OF SIGNER (Type or print)  | 16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)<br><u>W. R. KIVETT</u> |
| 15B. CONTRACTOR/OFFEROR<br><br>(Signature of person authorized to sign)                      | 15C. DATE SIGNED  |
| 16B. UNITED STATES OF AMERICA<br>BY <u>[Signature]</u><br>(Signature of Contracting Officer) | 16C. DATE SIGNED<br><u>5-11-92</u>  |

I. B.2, Level of Effort, Paragraph A. (Ref. Page 2) is revised to read as follows:

"A. In performing Government assigned work orders under this contract and the on-going services outlined in Tasks 2.5 and 2.6 of the Statement of Work, the Contractor is obligated to provide up to 391,125 direct productive labor hours (including those hours associated with subcontracts or teaming arrangements) as defined in Paragraph C. below."

II. I.2, FAR Clause 52.225-13, Restrictions on Contracting with Sanctioned Persons (APR 1991) is hereby deleted from the RFP (Ref. Page 24).

III. K.17, Notice of Restrictions on Contracting with Sanctioned Persons (FAR 52.225-12) (APR 1991), is hereby deleted from the RFP (Ref. Page 90).

IV. M.2.D, Factor 4 - Other Considerations, paragraph entitled, "Subfactor 4 - Contract Terms and Conditions" (Ref. Pages 121 and 122), the last sentence on Page 122 is revised to read as follows:

"The offeror's rationale for and the acceptability of any exceptions will be evaluated."

V. Attachment 5, Cost Proposal Forms A through C, a revised Form B1 (Ref. Page 215) is included as an enclosure to this amendment.



**SOLICITATION, OFFER AND AWARD**

1. THIS CONTRACT IS A RATED ORDER UNDER DPAS (15 CFR 350)

RATING

DO-C9

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1 | 281

PAGES

|  |                                       |   |                           |  |
|--|---------------------------------------|---|---------------------------|--|
| 2. CONTRACT NO.  | 3. SOLICITATION NO.<br>1-39-1270.0267 | 4. TYPE OF SOLICITATION<br><input type="checkbox"/> SEALED BID (IFB)<br><input checked="" type="checkbox"/> NEGOTIATED (RFP)                      | 5. DATE ISSUED<br>4/27/92 | 6. REQUISITION/PURCHASE NO.<br>1270.0267 |
| 7. ISSUED BY<br>National Aeronautics and Space Administration<br>Langley Research Center<br>Hampton, VA 23665-5225 |                                       | 8. ADDRESS OFFER TO (If other than Item 7)<br>NASA, Langley Research Center<br>9A Langley Blvd. (Bldg. 1195A), Room 103<br>Hampton, VA 23665-5225 |                           |  |

NOTE: In sealed bid solicitations "offer" and "offeror" mean "bid" and "bidder".

**SOLICITATION**

9. Sealed offers in original and fifteen (15) copies for furnishing the supplies or services in the Schedule will be received at the place specified in Item 8, or if handcarried, in the depository located in 9A Langley Blvd. (Bldg. 1195A), Room 103 until 4:00 local time 6/11/92  
(Hour) (Date)

CAUTION - LATE Submissions, Modifications, and Withdrawals: See Section L, Provision No. 52.214-7 or 52.215-10. All offers are subject to all terms and conditions contained in this solicitation.

|                           |                          |   |
|---------------------------|--------------------------|---|
| 10. FOR INFORMATION CALL: | A. NAME<br>SEE SECTION L | B. TELEPHONE NO. (Include area code) (NO COLLECT CALLS) |
|---------------------------|--------------------------|---|

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| (V)                   | SEC. | DESCRIPTION                           | PAGE(S) | (V)  | SEC. | DESCRIPTION  | PAGE(S) |
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**OFFER (Must be fully completed by offeror)**

NOTE: Item 12 does not apply if the solicitation includes the provisions at 52.214-16, Minimum Bid Acceptance Period.

12. In compliance with the above, the undersigned agrees, if this offer is accepted within \_\_\_\_\_ calendar days (60 calendar days unless a different period is inserted by the offeror) from the date for receipt of offers specified above, to furnish any or all items upon which prices are offered at the price set opposite each item, delivered at the designated point(s), within the time specified in the schedule. (See SECTION K for Negotiated RFP)

|   |                  |                  |                  |               |
|---|------------------|------------------|------------------|---------------|
| 13. DISCOUNT FOR PROMPT PAYMENT (See Section I, Clause No. 52-232-8)  | 10 CALENDAR DAYS | 20 CALENDAR DAYS | 30 CALENDAR DAYS | CALENDAR DAYS |
|   | 3%               | 5%               | 7%               | 8%            |
| 14. ACKNOWLEDGMENT OF AMENDMENTS (The offeror acknowledges receipt of amendments to the SOLICITATION for offerors and related documents numbered and dated: | AMENDMENT NO     | DATE             | AMENDMENT NO     | DATE          |
|   |                  |                  |                  |               |

|  |   |          |   |
|--|---|----------|---|
| 15A. NAME AND ADDRESS OF OFFEROR       | CODE  | FACILITY | 16. NAME AND TITLE OF PERSON AUTHORIZED TO SIGN OFFER (Type or print) |
|  |   |          |   |
| 15B. TELEPHONE NO. (Include area code) | 15C. CHECK IF REMITTANCE ADDRESS IS DIFFERENT FROM ABOVE - ENTER SUCH ADDRESS IN SCHEDULE |          | 17. SIGNATURE   |
|  |   |          |   |
|  |   |          | 18. OFFER DATE  |
|  |   |          |   |

**AWARD (To be completed by Government)**

|   |            |   |  |
|---|------------|---|--|
| 19. ACCEPTED AS TO ITEMS NUMBERED   | 20. AMOUNT | 21. ACCOUNTING AND APPROPRIATION  |  |
|   |            |   |  |
| 22. AUTHORITY FOR USING OTHER THAN FULL AND OPEN COMPETITION:<br><input type="checkbox"/> 10 U.S.C. 2304(c) ) <input type="checkbox"/> 41 U.S.C. 253(c) ) |            | 23. SUBMIT INVOICES TO ADDRESS SHOWN IN ITEM 25. below (4 copies unless otherwise specified)            |  |
| 24. ADMINISTERED BY (If other than Item 7) CODE   |            | 25. PAYMENT WILL BE MADE BY CODE  |  |
| Criticality Designator C  |            | Financial Management Division<br>Mail Stop 175, NASA, Langley Research Center<br>Hampton, VA 23665-5225 |  |
| 26. NAME OF CONTRACTING OFFICER (Type or print)   |            | 27. UNITED STATES OF AMERICA  |  |
|   |            | (Signature of Contracting Officer)  |  |
|   |            | 28. AWARD DATE  |  |

IMPORTANT - Award will be made on this Form, or on Standard Form 26, or by other authorized official written notice.



Langley Research Center  
Hampton, Virginia  
23665-5225

**SOLICITATION NO:** 1-39-1270.0267

**REQUIREMENT:** INSTRUMENT SUPPORT SERVICES

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- \* A PREPROPOSAL CONFERENCE WILL BE HELD AT LANGLEY RESEARCH CENTER ON MAY 18, 1992. SEE L.25 FOR DETAILS OF THE CONFERENCE.
- \* YOUR ATTENTION IS DIRECTED TO L.38; PROPOSAL PREPARATION AND SUBMISSION - SPECIAL INSTRUCTIONS, FOR IMPORTANT INSTRUCTIONS ON PROPOSAL PREPARATION. ALSO, SEE SECTION M FOR IMPORTANT EVALUATION INFORMATION.
- \* THIS PROPOSAL CONTAINS A GEOGRAPHICAL LIMITATION. YOUR ATTENTION IS INVITED TO L.33 FOR FURTHER INFORMATION.

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PART I - THE SCHEDULE

SECTION B - SUPPLIES OR SERVICES AND PRICE/COSTS

B.1 SCOPE OF WORK--ALTERNATE II (LaRC 52.212-90) (JUL 1991)

A. The Contractor shall, except as otherwise specified herein, furnish all personnel, facilities, services, equipment, supplies, and materials necessary for performance of instrument support services as broadly described in Section C, Description/Specifications/Work Statement.

B. Except for Statement of Work Tasks 2.5, Receipt and Inspection of New Instruments and Systems and 2.6, Instrument Pool, specific detailed performance requirements within the Statement of Work will be directed by the Government in accordance with the procedures outlined in G.1, Work Orders.

C. Receipt and Inspection of New Instruments and Systems and Instrument Pool--The Contractor shall perform the services outlined in Tasks 2.5 and 2.6 of Section C, Description/Specifications/Work Statement. The Contractor shall manage all aspects of these two areas with monitoring and oversight by the Government.

B.2 LEVEL-OF-EFFORT

A. In performing Government assigned work orders under this contract and the on-going services outlined in Tasks 2.5 and 2.6 of the Statement of Work, the Contractor is obligated to provide up to 391,125 direct productive labor hours as defined in paragraph C. below.

B. Notwithstanding the hours expended in the performance of Tasks 2.5 and 2.6, Government authorized work orders will be issued requiring a cumulative minimum of 234,675 direct productive labor hours.

C. Direct productive labor hours are defined as those hours expended by personnel in the performance of the effort set forth in Section C, Description/Specifications/Work Statement. This does not include the Contract Manager, Technical Manager(s), or other administrative and support personnel such as financial, clerical, and procurement, or any labor allocated as indirect. However, it does include all hours expended by the first-line supervisors/group leaders, even though they may be dual-functioned positions. Direct productive labor hours shall mean hours actually worked, including overtime but excluding all paid absences (vacation, holidays, sick, etc.).

B.3 ESTIMATED COST, AWARD FEE AND FIXED FEE

A. The estimated cost of this contract is \$ \_\_\_\_\_, exclusive of the award fee of \$ \_\_\_\_\_ and fixed fee\* of \$0. The total estimated cost, award fee, and fixed fee is \$ \_\_\_\_\_.

\*A fixed fee amount will be inserted if the Government exercises any of the one-month options to extend the period of performance as set forth in Section H.21.A.

B. Other Direct Cost (ODC) Limitation--The estimated cost set forth above includes a \$1,010,000 limitation for specific ODC expenditures under the contract. The ODC categories subject to this cost limitation consist of material purchases and travel costs, required in the performance of the Statement of Work tasks. No other ODC's shall be applied toward this cost limitation.

C. The available award fee for each evaluation period is as follows:

| <u>Period</u>                      | <u>Available Award Fee</u> |
|------------------------------------|----------------------------|
| October 1, 1992 - March 31, 1993   | \$                         |
| April 1, 1993 - September 30, 1993 | \$                         |

#### B.4 CONTRACT FUNDING (NASA 18-52.232-81) (JUN 1990)

(a) For purposes of payment of cost, exclusive of fee, in accordance with the Limitation of Funds clause, the total amount allotted by the Government to this contract is \$ and covers the following estimated period of performance:

(b) An additional amount of \$ is obligated under this contract for payment of fee.

### SECTION C - DESCRIPTION/SPECIFICATIONS/WORK STATEMENT

#### C.1 STATEMENT OF WORK - INSTRUMENT SUPPORT SERVICES (LaRC 52.215-90) (JUN 1988)

##### 1.0 Introduction

Instrumentation at NASA Langley Research Center (LaRC) is generally divided into three categories: industrial instrumentation that is associated with LaRC facilities' operation, control, and safety; centralized computers used for analysis, computation, and business data; and instrumentation and digital systems that are associated with research measurements in our test facilities and projects. The objective of this effort is to provide daily instrument support services that reliably and economically satisfy the Langley Research Center's research measurement requirements.

The majority of the work will be performed at the Contractor's facility; a lesser amount will be performed on-site at Langley Research Center and at Wallops Flight Center; and a small portion of the work will be performed at other remote test sites (e.g., Edwards Air Force Base, California).

##### 1.1 Scope

1.1.1 The Contractor shall provide support for LaRC's research instrumentation requirements. This support shall include:

- Repair, calibration, and maintenance of instruments and instrumentation systems.

- Application/installation of transducers.
- Digital systems maintenance and repair, including hardware and software upgrades to current revision levels, when required.
- Design and modification of research data acquisition systems.
- On-site preventive maintenance and emergency repair.
- Evaluation of measurement requirements, instruments, and systems.
- Analysis of measurement data.
- Documentation services for test results and digital systems hardware and software.
- Maintaining records of instrument service history.
- Operating a systematic preventive maintenance and calibration program on specified instruments and systems.
- Operating an instrument loan pool.
- Receipt and inspection of new instruments purchased by NASA LaRC.
- Operating a Measurement Assurance Program for LaRC and NASA measurement traceability to the National Institute of Standards and Technology.

## 1.2 Requirement

- 1.2.1 In addition to the services required by Tasks 2.5 and 2.6, the Contractor shall perform tasks as delineated in work orders provided by the Government in accordance with the Contract Schedule.
- 1.2.2 The applicable quality and reliability provision of Langley Management Instructions (LMI 5300.1 and LMI 5330.9), NASA Handbooks (NHB 5300.4 [3A-1] and NHB 5300.4 [1c], Langley Handbooks (LHB 5300.1 and LHB 5330.9), the receipt and inspection provisions of Instrument Research Division Instruction 91-1, Metrology Requirements List (METRL), NASA Software Documentation Standard NASA-STD-2100-91, and specific requirements designated in work orders shall be met.
- 1.2.3 The Contractor shall train his personnel as required to competently carry out the requirements of Tasks 2.5 and 2.6, and the instrumentation support requested on the Government work orders. When required, the Government will conduct special

orientation sessions to acquaint Contractor personnel with unique work requirements.

1.2.4 The Contractor shall respond to emergency or quick turn around work orders within 30 minutes during the Government's first (7:30 a.m. - 4:00 p.m.) and second (3:30 p.m. - 12:00 midnight) shifts. The Contractor shall provide 24-hour on-call emergency service.

1.2.5 Equipment transported shall be physically handled in a manner commensurate with its size, weight, and fragility, so as to prevent any deterioration and damage. All movement shall be performed by equipment handlers who are familiar with the precautions required for handling delicate instruments. Only rubber-tired carts shall be used for movement within the Contractor's facility. Transportation between the Contractor's facility and NASA facilities shall be by enclosed vans equipped with suitable protective padding.

## 2.0 Task Areas

The required instrument support services include the following task areas:

### 2.1 Instrument Repair and Maintenance

The Contractor shall repair, modify, assemble, and maintain all Government research test instrumentation; shall provide a periodic calibration/preventive maintenance and repair program for critical high usage rate instruments as specified by the Government; and shall generate and maintain instrument maintenance data for evaluating repair effectiveness. The instruments include transducers which measure parameters such as temperature, humidity, pressure, vacuum, force, velocity, and acceleration, and include recording instrumentation such as tape systems, oscillographs, and pen recorders. These instruments are relatively new and possess state-of-the-art circuitry and components. The Contractor shall acquire repair parts and maintain an inventory of common usage items (spares) for performance of the above services. The Contractor shall contact the instrument manufacturer to provide repair of defective instrumentation under warranty.

### 2.2 Calibration

The Contractor shall calibrate instruments and equipment using standards that are a minimum of four times greater in accuracy than the instrument being calibrated unless specifically authorized in writing to do otherwise by the cognizant Government representative. Calibration shall be performed in accordance with standard calibration procedures described in the Instrument Society of America (ISA), Standards and Practices for Instrumentation or as established by the Government.

### 2.3 Digital Systems

The Contractor shall be responsible for digital system implementation and maintenance.

The Contractor shall support the planning and modification of digital instrumentation and data acquisition systems. The Contractor's responsibilities shall include establishment of system designs based on Government requirements; design of hardware and software; design and test of special interfaces and subunits; fabrication of prototype units; system software design, code development, test, documentation and configuration control; user training; and generation of user instruction manuals and manloading estimates for tasks.

The Contractor shall maintain digital equipment and systems currently in operation at LaRC and any new equipment or systems acquired by the Government. The major minicomputer systems suppliers including: DEC, HP, and MODCOMP; major workstation suppliers including: HP, Sun, DEC, Silicon Graphics; major interactive terminal suppliers including: Tektronix, Wyse, and Graphon; and all makes of personal computers. Maintenance shall include hardware and software revisions when required by the Government. Documentation services shall also be provided for digital systems hardware and software.

### 2.4 Engineering Application

The Contractor shall select instruments and transducers to satisfy daily research measurement requirements; assemble and install instruments into complete measuring and recording systems; test and analyze measurement systems for proper operation; field calibrate, analyze, and repair malfunctioning systems; modify instruments; and reduce, analyze, and document test results.

### 2.5 Receipt and Inspection of New Instruments and Systems

New instruments purchased by NASA, Langley Research Center, will be delivered to the Contractor's facility. In accordance with Instrument Research Division Instruction 91-1, Procedures for Receipt and Inspection Functions at Contractor-Operated Facility, the Contractor shall inspect these instruments within 10 calendar days of receipt to insure compliance with procurement specifications. The Contractor shall use standard techniques for instrument testing; devise new test techniques when no existing test standards apply; and analyze and document test results. Instruments failing to comply with procurement requirements shall be returned to the vendor by the Contractor, if appropriate.

### 2.6 Instrument Pool

The Contractor shall provide operational support for LaRC's instrument loan pool including transporting instruments to be serviced between the pool and the Contractor's facility. Tasks shall include the issuing of instruments, maintaining instrument accountability and service history (approximately 100,000 items), advising users on instrument capabilities and applications, and recall of instruments on special loan or maintenance programs. Work shall be performed on-site in LaRC's Instrument Control Unit.



SECTION E - INSPECTION AND ACCEPTANCEE.1 INSPECTION OF SERVICES - COST-REIMBURSEMENT (FAR 52.246-5)  
(APR 1984)

- (a) Definition. "Services," as used in this clause, includes services performed, workmanship, and material furnished or used in performing services.
- (b) The Contractor shall provide and maintain an inspection system acceptable to the Government covering the services under this contract. Complete records of all inspection work performed by the Contractor shall be maintained and made available to the Government during contract performance and for as long afterwards as the contract requires.
- (c) The Government has the right to inspect and test all services called for by the contract, to the extent practicable at all places and times during the term of the contract. The Government shall perform inspections and tests in a manner that will not unduly delay the work.
- (d) If any of the services performed do not conform with contract requirements, the Government may require the Contractor to perform the services again in conformity with contract requirements, for no additional fee. When the defects in services cannot be corrected by reperformance, the Government may (1) require the Contractor to take necessary action to ensure that future performance conforms to contract requirements and (2) reduce any fee payable under the contract to reflect the reduced value of the services performed.
- (e) If the Contractor fails to promptly perform the services again or take the action necessary to ensure future performance in conformity with contract requirements, the Government may (1) by contract or otherwise, perform the services and reduce any fee payable by an amount that is equitable under the circumstances or (2) terminate the contract for default.

SECTION F - DELIVERIES OR PERFORMANCE

## F.1 STOP-WORK ORDER (FAR 52.212-13) (AUG 1989)

- (a) The Contracting Officer may, at any time, by written order to the Contractor, require the Contractor to stop all, or any part, of the work called for by this contract for a period of 90 days after the order is delivered to the Contractor, and for any further period to which the parties may agree. The order shall be specifically identified as a stop-work order issued under this clause. Upon receipt of the order, the Contractor shall immediately comply with its terms and take all reasonable steps to minimize the incurrence of costs allocable to the work covered by the order during the period of work stoppage. Within a period of 90 days after a stop-work order is delivered to the Contractor, or within any extension of that period to which the parties shall have agreed, the Contracting Officer shall either -
- (1) Cancel the stop-work order; or
  - (2) Terminate the work covered by the order as provided in the Default, or the Termination for Convenience of the Government, clause of this contract.
- (b) If a stop-work order issued under this clause is canceled or the period of the order or any extension thereof expires, the Contractor shall resume work. The Contracting Officer shall make an equitable adjustment in the delivery schedule or contract price, or both, and the contract shall be modified, in writing, accordingly, if -

- (1) The stop-work order results in an increase in the time required for, or in the Contractor's cost properly allocable to, the performance of any part of this contract; and
- (2) The Contractor asserts its right to the adjustment within 30 days after the end of the period of work stoppage; provided, that, if the Contracting Officer decides the facts justify the action, the Contracting Officer may receive and act upon the claim submitted at any time before final payment under this contract.
- (c) If a stop-work order is not canceled and the work covered by the order is terminated for the convenience of the Government, the Contracting Officer shall allow reasonable costs resulting from the stop-work order in arriving at the termination settlement.
- (d) If a stop-work order is not canceled and the work covered by the order is terminated for default, the Contracting Officer shall allow, by equitable adjustment or otherwise, reasonable costs resulting from the stop-work order.

#### F.2 PERIOD OF PERFORMANCE (NASA 18-52.212-74) (DEC 1988)

The period of performance of this contract shall be 12 months from the effective date of this contract.

#### F.3 PLACE OF DELIVERY--ALTERNATE II (LARC 52.212-92) (JUN 1988)

Delivery of all items hereunder shall be f.o.b. Langley Research Center, except as may be specified in work orders.

#### F.4 PLACES OF PERFORMANCE--ALTERNATE II (LARC 52.212-98) (JUN 1988)

The places of performance shall be the Contractor's facility; NASA, Langley Research Center, Hampton, Virginia; Wallops Flight Facility, Wallops Island, Virginia; and other sites as may be designated by work orders.

#### F.5 REPORTS AND DOCUMENTATION DELIVERY (LARC 52.212-99) (JUN 1988)

The Contractor shall provide to the Government all reports and items of documentation as required by Section I, Contract Clauses, Exhibit A, Contract Documentation Requirements and by individual work orders.

### SECTION G - CONTRACT ADMINISTRATION DATA

#### G.1 WORK ORDERS (LARC 52.212-101) (OCT 1991)

A. The work to be performed within the areas outlined in Section C, Description/Specifications/Work Statement, will be more specifically directed by means of written work orders issued by the Government (except for SOW Tasks 2.5 and 2.6), containing the following information:

1. Date; work order number
2. Requestor; monitor; requesting organization

3. Description of work, specifications and/or end item
4. Required schedule
5. Manpower estimate
- (\*) 6. Material cost estimate
- (\*) 7. Government-furnished items
- (\*) 8. Applicable special instructions

(\*) To be provided at the option of the Government.

B. Two copies of each work order will be furnished to the Contractor, one shall be retained by the Contractor and one shall be returned to the Contracting Officer's Technical Representative upon completion of the work specified therein. The work order shall contain, as applicable, actual completion dates and/or delivery dates, actual man-hours expended, actual material and labor costs incurred, and any remarks which the Contractor may wish to make with respect to his performance thereunder.

C. The Contractor shall furnish a control and reporting system capable of accurately obtaining on a weekly basis actual man-hours, labor costs, and material costs associated with each LARC work order number.

D. If any work order is considered by the Contractor to be outside the scope of this contract, or if the Contractor has reason to believe that he will exceed the scope of his contractual obligation (e.g. contract level of effort, contract funding, contract estimated cost) in the performance thereof, the Contractor shall immediately notify the Contracting Officer in writing, and shall not perform any work associated with the work order pending resolution by the Contracting Officer.

#### G.2 AWARD FEE EVALUATIONS (LARC 52.216-92) (JUN 1990)

A. The Contractor's performance hereunder shall be evaluated each period by an Evaluation Board in accordance with an established evaluation plan. A copy of this plan shall be furnished to the Contractor within sixty (60) days of the effective date of this contract. This plan may be modified by the Government and a copy of any modification will be provided to the Contractor. The Board shall review the Contractor's performance for each period in the following areas:

Performance of Work (Technical/Management)  
Cost  
Safety - 5%

B. The findings of the Board shall be reported to the Fee Determination Official (a cognizant individual at the program director level or higher of LARC management) who will determine to what extent the Contractor's performance for the preceding award fee evaluation period warrants payment of some portion of the available award fee specified in Section B. In no event will any unawarded

portion of fee for any evaluation period become available for award in subsequent periods.

C. The Contractor will be notified of the Fee Determination Official's determination of award fee by the Contracting Officer in a Notice of Award Fee, and such decision shall be binding on both parties and not subject to the Section I clause entitled "Disputes - Alternate I."

D. In the event this contract is terminated prior to a regularly scheduled award fee determination, the fee to be paid to the Contractor shall be an

appropriate portion of any available award fee, as may be determined by the Fee Determination Official.

E. The Contractor may submit evaluation plan recommendations pertinent to factors such as evaluation criteria, methods of measurement, definitions, ground rules, and relative importance to the Contracting Officer. Such recommendations may be for the initial evaluation period or for subsequent periods. Recommendations for the initial period should be received by the Contracting Officer no later than the effective date of the contract and for subsequent periods no later than thirty (30) days prior to the beginning of the period.

G.3 DESIGNATION OF NEW TECHNOLOGY REPRESENTATIVE AND PATENT REPRESENTATIVE (NASA 18-52.227-72) (APR 1984)

(a) For purposes of administration of the clause of this contract entitled "New Technology" or "Patent Rights - Retention by the Contractor (Short Form)", whichever is included, the following named representatives are hereby designated by the Contracting Officer to administer such clause:

| <u>Title</u>                  | <u>Office Code</u> | <u>Address (including zip code)</u>                     |
|-------------------------------|--------------------|---|
| New Technology Representative | 200                | NASA, Langley Research Center<br>Hampton, VA 23665-5225 |
| Patent Representative         | 143                | NASA, Langley Research Center<br>Hampton, VA 23665-5225 |

(b) Reports of reportable items, and disclosure of subject inventions, interim reports, final reports, utilization reports, and other reports required by the clause, as well as any correspondence with respect to such matters, should be directed to the New Technology Representative unless transmitted in response to correspondence or request from the Patent Representative. Inquiries or requests regarding disposition of rights, election of rights, or related matters should be directed to the Patent Representative. This clause shall be included in any subcontract hereunder requiring a "New Technology" clause or "Patent Rights - Retention by the Contractor (Short Form)" clause, unless otherwise authorized or directed by the Contracting Officer. The respective responsibilities and authorities of the above-named representatives are set forth in 18-27.375-3 of the NASA FAR Supplement.

G.4 SUBMISSION OF INVOICES--ALTERNATE I (LaRC 52.232-94)  
(NOV 1989)

Proper invoices, as determined under the Section I clause entitled "Prompt Payment," shall be addressed to the designated payment office shown in Block 12. on page 1 of this contract. Cost and fee invoices shall be submitted separately. Cost invoices, shall be submitted through the delegated Government Audit Agency, which shall be the designated billing office. Fee invoices shall be submitted through the NASA Contracting Officer with a copy to the delegated Audit Agency.

G.5 PAYMENTS--COST, AWARD FEE, AND FIXED FEE

Payments of cost shall be made in monthly installments. Payments of award fee shall be made in response to and in the amount of the Fee Determination Official's written Notice of Award Fee as set forth in G.2 above. Payments of award fee are subject to the withholding provisions of the Section I clause entitled "Award Fee." Payments of fixed fee shall be made in monthly installments based upon percentage of completion of work as determined by the Contracting Officer and subject to the withholding provisions of the Section I clause entitled "Fixed Fee."

G.6 CONTRACT CLOSEOUT (LaRC 52.242-90) (JUN 1988)

A. Reassignment--After receipt, inspection, and acceptance by the Government of all required articles and/or services, and resolution of any pending issues raised during the Period of Performance, this contract will be reassigned to the NASA Langley Research Center Contracting Officer for Contract Closeout. All transactions subsequent to the physical completion of the contract should, therefore, be addressed to the said Contracting Officer at NASA Langley Research Center, Mail Stop 126, who may be reached by telephone at (804) 864-2462.

B. "Quick Closeout"--Paragraph (f) of the Allowable Cost and Payment clause of this contract addresses the "Quick Closeout Procedure" delineated by Subpart 42.7 of the Federal Acquisition Regulation (FAR). It should be understood that the said procedure applies to the settlement of indirect costs for a specific contract in advance of the determination of final indirect cost rates when the amount of unsettled indirect cost to be allocated to the contract is relatively insignificant. Therefore, the "Quick Closeout" procedure does not preclude the provisions of paragraph (d) of the Allowable Cost and Payment clause nor does it constitute a waiver of final audit of the Contractor's Completion Voucher.

C. Completion Voucher Submittal--Notwithstanding the provisions of the Allowable Cost and Payment clause, as soon as practicable after settlement of the Contractor's indirect cost rates applicable to performance of the contract, the Contractor shall submit a Completion Voucher as required by the aforesaid clause. The Completion Voucher shall be supported by a cumulative claim and reconciliation statement and executed NASA Forms 778, Contractor's Release, and 780, Contractor's Assignment of Refunds, Rebates, Credits, and Other Amounts. Unless directed otherwise by the Contracting Officer for Contract Closeout, the Contractor shall forward the said Completion Voucher directly to the cognizant Government Agency to which audit functions under the contract have been delegated.

SECTION H - SPECIAL CONTRACT REQUIREMENTS

## H.1 RIGHTS TO PROPOSAL DATA (TECHNICAL) (FAR 52.227-23) (JUN 1987)

Except for data contained on pages \_\_\_\_\_, it is agreed that as a condition of award of this contract, and notwithstanding the conditions of any notice appearing thereon, the Government shall have unlimited rights (as defined in the "Rights in Data - General" clause contained in this contract) in and to the technical data contained in the proposal dated \_\_\_\_\_, upon which this contract is based.

H.2 KEY PERSONNEL AND FACILITIES (NASA 18-52.235-71)  
(MAR 1989)

(a) The personnel and/or facilities listed below (or specified in the Contract Schedule) are considered essential to the work being performed under this contract. Before removing, replacing, or diverting any of the listed or specified personnel or facilities, the Contractor shall (1) notify the Contracting Officer reasonably in advance and (2) submit justification (including proposed substitutions) in sufficient detail to permit evaluation of the impact on this contract.

(b) The Contractor shall make no diversion without the Contracting Officer's written consent; provided, that the Contracting Officer may ratify in writing the proposed change, and that ratification shall constitute the Contracting Officer's consent required by this clause.

(c) The list of personnel and/or facilities (shown below or as specified in the Contract Schedule) may, with the consent of the contracting parties, be amended from time to time during the course of the contract to add or delete personnel and/or facilities.

To Be Negotiated

H.3 STATEMENT OF EQUIVALENT RATES FOR FEDERAL HIRES (FAR 52.222-42)  
(MAY 1989)

In compliance with the Service Contract Act of 1965, as amended, and the regulations of the Secretary of Labor (29 CFR Part 4), this clause identifies the classes of service employees expected to be employed under the contract and states the wages and fringe benefits payable to each if they were employed by the contracting agency subject to the provisions of 5 U.S.C. 5341 or 5332.

THIS STATEMENT IS FOR INFORMATION ONLY: IT IS NOT A WAGE DETERMINATION

| Employee Class                                       | Monetary Wage     |
|--|-------------------|
| Electronic Maintenance Technician Supervisor         | \$15.54           |
| Electro-Mechanical Maintenance Technician Supervisor | \$12.07           |
| Instrument Calibration Aide                          | \$ 7.57           |
| Calibration Engineering Technical                    | \$12.84 - \$14.14 |
| Electronics Technician                               | \$10.50 - \$12.84 |
| Experimental Electronics Mechanic                    | \$12.07           |
| Camera Repair Mechanic                               | \$12.07           |

|                               |                   |
|-------------------------------|-------------------|
| Engineering Technician        | \$11.63 - \$14.14 |
| Machinist                     | \$12.07           |
| Engineering Draftsman         | \$10.50           |
| Instrument Control Clerk      | \$ 6.75           |
| Production Control Supervisor | \$11.63           |
| Shipping/Receiving Clerk      | \$ 9.53           |
| Technical Editor              | \$12.84           |
| Technical Typist              | \$ 7.57           |
| Equipment Handler/Driver      | \$ 9.00           |
| Clerk Typist                  | \$ 6.75 - \$7.57  |

FRINGE BENEFITS

- Annual Leave - Receives 13 days paid leave for service up to 3 years; 20 days for 3 to 15 years service; and 26 days for 15 years service or over.
- Sick Leave - Receives 13 days paid leave per year.
- Holidays - Receives 10 paid holidays per year.
- Health Insurance - Government pays up to 60% of health insurance.
- Group Life Insurance - Government pays two-thirds of life insurance rate premiums.
- Retirement - The Government provides two retirement plans identified as the Civil Service Retirement System (CSRS) and the Federal Employees Retirement System (FERS). Under the CSRS the Government contributes 7% of the employees' base pay towards retirement. Under the FERS the Government contributes 13% of the employees' base pay towards a basic benefit plan, and up to 5% to a thrift savings plan. Furthermore, under FERS employees are covered by FICA.

Part-time Federal employees receive pro rata annual leave, sick leave, holiday leave, health insurance, and group life insurance benefits based on the number of hours worked.

#### H.4 INSTALLATION-PROVIDED PROPERTY AND SERVICES (NASA 18-52.245-77) (MAR 1989)

The Contractor is authorized use of the types of property and services listed below, to the extent they are available, while on-site at the NASA installation. In addition, the items marked by an asterisk (\*) will be available for use by both on-site and off-site personnel.

(a) Office space, work area space, and utilities. The Contractor shall use Government telephones for official purposes only.

(b) General- and special-purpose equipment, including personal computers and office furniture.

(1) The Government retains accountability for this property under the Installation-Provided Government Property clause, regardless of its authorized location.

(2) If the Contractor acquires property as a direct cost under this contract, this property also shall become accountable to the Government upon its entry into the NASA Equipment Management System (NEMS) in accordance with the property-reporting requirements of this contract.

(3) The Contractor shall not bring on-site for use under this contract any property owned or leased by the Contractor, or other property that the Contractor is accountable for under any other Government contract, without the Contracting Officer's prior written approval. This restriction does not pertain to the Contractor-furnished vehicles.

(c) Safety and fire protection for Contractor personnel and facilities.

(d) Medical treatment of a first-aid nature for Contractor personnel injuries or illnesses sustained during on-site duty.

(e) Building maintenance for facilities occupied by Contractor personnel.

(f) Moving and hauling for office moves, movement of large equipment, and delivery of supplies. Moving services shall be provided on-site, as approved by the Contracting Officer.

(g) The responsibilities of the Contractor as contemplated by paragraph (a) of the Installation-Provided Government Property clause are defined in the following property management directives and installation supplements to these Directives:

(1) NHB 4200.1, NASA Equipment Management Manual.

(2) NHB 4200.2, NASA Equipment Management System (NEMS) User's Guide for Property Custodians.

(3) NHB 4300.1, NASA Personal Property Disposal Manual.

(4) NHB 4100.1, NASA Materials Inventory Management Manual.

\*(h) On-Center and off-Center mail delivery.

\*(i) Cafeteria privileges for Contractor employees during normal operating hours.

\*(j) Publications, blank forms, magnetic tape, printer paper, and other data processing supplies stocked by the installation.

\*(k) Access to LaRC's library facilities.

\*(l) Fuel, scheduled maintenance, parts and repairs (except those covered by manufacturer's warranty) for all Contractor-provided vehicles.

\*(m) Photographic services as required by work orders.

\*(n) Government material cards issued to permit authorized Contractor personnel to draw from LaRC Store issue supplies; e.g., office, laboratory and shop supplies) provided such withdrawals are approved by the COTR.



#### H.5 USE OF GOVERNMENT PRODUCTION AND RESEARCH PROPERTY ON A NO-CHARGE BASIS

The Contractor is authorized to use on a no-charge, non-interference basis in the performance of this contract, the Government-owned Production and Research property provided to him under the contract(s) identified below. Such use is authorized on the basis that it will not interfere with performance of the Government contract(s) for which such property was provided and, unless otherwise stipulated, shall be in accordance with the terms and conditions thereof.

NAS1-18588(F) or successor contract

#### H.6 PROCUREMENT AUTHORITY--ALTERNATE II (201-39.5202-3) (OCT 90 FIRMR)

This acquisition is being conducted under a specific acquisition delegation of GSA's exclusive procurement authority for FIP resources. The specific GSA DPA case number is KMA 920222.

#### H.7 SECURITY CLEARANCE FOR CONTRACTOR EMPLOYEES

By virtue of their particular work assignment, certain Contractor employees may be required to have a security clearance granted in accordance with DOD 5220.22M, the Department of Defense Industrial Security Manual for Safeguarding Classified Information (ISM). CONFIDENTIAL security clearances shall be issued by the Contractor's Security Officer. SECRET or higher clearances shall be issued by the Department of Defense (DOD). Within ten (10) working days after an employee is identified by the Government as requiring a SECRET or higher clearance, the Contractor shall submit to the Contracting Officer evidence of the submittal of a request for clearance to DOD for such employee. If the clearance for an employee has not been issued by DOD within 120 calendar days of the submittal of the request for clearance to DOD, the Contractor may be required to remove such employee from the contract.

#### H.8 SECURITY PROGRAM/FOREIGN NATIONAL EMPLOYEE INVESTIGATIVE REQUIREMENTS (LaRC 52.204-91) (NOV 1991)

Prior to reporting to Langley Research Center (LaRC) to perform under a contract or grant, each Foreign National shall have approval for access to LaRC facilities from NASA Headquarters, International Relations Division (Code XID). A copy of the access authorization request shall be provided to the LaRC Chief of Security. Additionally, an investigation by the Government shall be completed on each Foreign National contractor prior to reporting to LaRC to perform under a contract or grant. A properly executed "Name Check Request" (NASA Form 531) and a completed "applicant" fingerprint card shall be submitted to the LaRC Security Office, Mail Stop 182, for each Foreign National contractor at least 75 days prior to the estimated entry on duty date. The NF 531 and fingerprint card may be obtained from the LaRC Security Office. If the access approval is obtained from NASA Headquarters prior to completion of the investigation, and the Contracting Officer requires a Foreign National to work on LaRC, an escort request may be considered by the LaRC Chief of Security.

H.9 AUTOMATED INFORMATION SECURITY (AIS) PROGRAM/EMPLOYEE NATIONAL AGENCY CHECK (NAC) AND USER AGREEMENT EXECUTION (LaRC 52.239-90) (MAY 1991)

A. Work to be performed under this contract requires access to ADP equipment and processing areas. Therefore, the Contractor shall comply with the requirements of NASA's Automated Information Security Program. This program is separate and distinct from security programs for safeguarding classified information. Prior to performing any work in restricted-access computer rooms or accessing NASA ADPE (either remotely or on-site at LaRC), all Contractor employees must have a favorable NAC completed. The Contractor shall submit a properly executed NASA Form 531 (NF 531), Name Check Request, to the LaRC Security Officer, Mail Stop 182, for each Contractor employee who will work in restricted access computer rooms and/or access NASA ADPE. In addition, each such employee is required to be fingerprinted at the LaRC Badge and Pass Office, Building 1228, or by any authorized agency or department utilizing Fingerprint Card FD-258. Approximately 75 days are required to complete the NAC after receipt of the NF 531 and FD-258. The NAC is not required if an employee has a Secret or higher clearance. When it is necessary for an employee to perform any work in restricted access computer rooms prior to completion of the NAC, the employee may be escorted while at the site by an individual who has a favorable NAC or a higher level of investigation favorably adjudicated, or a Secret or higher clearance, or as otherwise approved by the Security Officer. Employees may access NASA ADP equipment prior to completion of the NAC only as approved by the LaRC Security Officer on a case-by-case basis.

B. The Contractor shall insure that all Contractor personnel execute a user agreement, Form No. ACD N-865, Responsibilities of Users of the NASA/LaRC Central Scientific Computer Complex, and any other forms that may be required by the Government prior to having access to NASA ADP resources. Unauthorized access to and/or use of LaRC computing systems is a violation of law and punishable under the provisions of 18 USC 1029, 18 USC 1030, and other applicable statutes. For compliance with Center Computer security policy, the Contractor shall promptly notify the Contracting Officer's Technical Representative (COTR) when an authorized user employee no longer requires computer access.

H.10 OBSERVATION OF REGULATIONS AND IDENTIFICATION OF CONTRACTOR'S EMPLOYEES (LaRC 52.212-104) (JUN 1988)

A. Observation of Regulations--In performance of that part of the contract work which may be performed at Langley Research Center or other Government installation, the Contractor shall require its employees to observe the rules and regulations as prescribed by the authorities at Langley Research Center or other installation.

B. Identification Badges--At all times while on LaRC property, the Contractor shall require its employees, subcontractors and agents to wear badges which will be issued by the NASA Contract Badge and Pass Office, located at 1 Langley Boulevard (Building No. 1228). Badges shall be issued only between the hours of 6:30 a.m. and 4:30 p.m., Monday through Friday. Contractors will be held accountable for these badges, and may be required to validate outstanding badges on an annual basis with the NASA LaRC Security Office. Immediately after employee

termination or contract completion, badges shall be returned to the NASA Contract Badge and Pass Office.

H.11 SUBCONTRACTING PLAN (LaRC 52.219-91) (JUN 1988)\*

The approved Contractor plan for subcontracting with small business and small disadvantaged business concerns is attached hereto as Exhibit D and is hereby made a part of this contract.

H.12 EVIDENCE OF INSURANCE (LaRC 52.228-93) (MAR 1989)

The Contractor shall submit evidence of the insurance coverage, required by the NASA Clause 18-52.228-75 in Section I entitled "Minimum Insurance Coverage" (i.e., a Certificate of Insurance or other confirmation), to the Contracting Officer prior to performing under this contract. In the event the Government exercises its options to extend the term of the contract, the Contractor shall also present such evidence to the Contracting Officer prior to commencement of performance under the extension.

H.13 STATE AND LOCAL SALES TAXES - VIRGINIA (LaRC 52.229-92)  
(MAR 1991)

To perform this contract, the Contractor must be knowledgeable of relevant state and local taxes when making purchases of tangible personal property. The Contractor shall refrain from paying nonapplicable taxes or taxes where an exemption exists, but shall pay applicable taxes that are reimbursable pursuant to FAR 31.205-41, Taxes. Even though title to property purchased under this contract may pass to the Government and the price is reimbursable under contract cost principles, such transactions do not in themselves provide tax immunity to the Contractor. Therefore, within 30 days after the effective date of this contract, the Contractor shall request from the Virginia State Tax Commission a ruling on any tax exemptions that may be applicable to purchases made under this contract. The Contractor shall provide all facts relevant to the situation and shall pursue an interpretation of the law that is most favorable to both the Contractor and the Government.

H.14 ADMINISTRATION OF CONTRACT FUNDING (LaRC 52.232-100)  
(MAR 1989)

A. The Contractor agrees that all future incremental funding shall be accomplished by Administrative Change Modification and that the funding procedure shall in no way change the Contractor's notification obligations as set forth in the "Limitation of Funds" clause.

B. In addition to the requirements of the "Limitation of Funds" clause, the Contractor shall notify the Contracting Officer in writing if, at any time, the Contractor has reason to believe that the total cost to the Government, exclusive of any fee, for the complete performance of this contract will be greater or substantially less than the then total estimated cost of the contract. Such notification shall give a revised estimate of the total cost for the performance of this contract.

\*Not applicable to small businesses.

H.15 WAGE DETERMINATIONS AND FRINGE BENEFITS (LaRC 52.237-90)  
(NOV 1990)

The Register of Wage Determinations and Fringe Benefits, Number 78-1030, Rev 21, dated September 18, 1991, lists the wage rate and fringe benefits for designated labor classifications which shall be the minimum paid under this contract. This determination constitutes the "attachment" as referred to in paragraph (a), Compensation, of the Section I clause entitled "Service Contract Act of 1965." A copy of this wage determination is attached hereto as Exhibit B.

H.16 INCORPORATION OF SECTION K OF THE PROPOSAL BY REFERENCE  
(LaRC 52.215-107) (MAR 1989)

Pursuant to FAR 15.406-1(b), the completed Section K of the proposal dated \_\_\_\_\_ is hereby incorporated herein by reference.

H.17 WORK SCHEDULE

In order that the necessary and proper inspection of the Contractor's work may be effectively accomplished, and to assure the availability of required Government interface, the Contractor shall schedule work performance hereunder so as to be compatible with the established workweek and hours of work observed by the Government organization having cognizance over the work being performed.

H.18 OPTION TO PURCHASE CONTRACTOR-PROVIDED VEHICLES\*

At the end of the contract period of performance, the Contractor grants the Government the following options regarding the Contractor-provided vehicles purchased for and used in performance of this contract: (1) The Contractor agrees to sell the vehicles to a successor Contractor at their depreciated value based on the Contractor's depreciation schedule; or (2) The Contractor agrees to sell the vehicles to the Government at their depreciated value based on the Contractor's depreciation schedule; or (3) The Contractor agrees to utilize the depreciated vehicles on a follow-on contract if the Contractor is the successor Contractor; or (4) The Contractor agrees to sell the vehicles for their fair market value within 90 days after the end of the period of performance and to credit the contract for the amount of any excess of the sale price minus the depreciated value and selling expenses. The Government may exercise one of the above options by unilateral modification issued to the Contractor not later than 30 days after the end of the contract period of performance.

H.19 OPTION TO TRANSFER LEASE ON CONTRACTOR-PROVIDED VEHICLES\*

The Contractor agrees to enter into a long-term lease(s) for the Contractor-furnished vehicles to be used in the performance of this contract, which is subject to being cancelled if the prime Contractor does not continue to perform the contract throughout the useful life of the vehicles (e.g., the Contractor is not selected in a subsequent recompetition). The lease(s) shall have an option to transfer the lease(s) to a successor Contractor.

\*Applicable clause will be negotiated into the contract.



| <u>Item</u>                                   | <u>First<br/>Option<br/>Period</u> | <u>Second<br/>Option<br/>Period</u> | <u>Third<br/>Option<br/>Period</u> | <u>Fourth<br/>Option<br/>Period</u> | <u>Fifth<br/>Option<br/>Period</u> | <u>Sixth<br/>Option<br/>Period</u> | <u>Seventh<br/>Option<br/>Period</u> | <u>Eighth<br/>Option<br/>Period</u> | <u>Ninth<br/>Option<br/>Period</u> |
|---|------------------------------------|-------------------------------------|------------------------------------|-------------------------------------|------------------------------------|------------------------------------|--------------------------------------|-------------------------------------|------------------------------------|
| 10/1/93 -<br>3/31/94                          | \$                                 |                                     |                                    |                                     |                                    |                                    |                                      |                                     |                                    |
| 4/1/94 -<br>9/30/94                           | \$                                 |                                     |                                    |                                     |                                    |                                    |                                      |                                     |                                    |
| 10/1/94 -<br>3/31/95                          |                                    | \$                                  |                                    |                                     |                                    |                                    |                                      |                                     |                                    |
| 4/1/95 -<br>9/30/95                           |                                    | \$                                  |                                    |                                     |                                    |                                    |                                      |                                     |                                    |
| 10/1/95 -<br>3/31/96                          |                                    |                                     | \$                                 |                                     |                                    |                                    |                                      |                                     |                                    |
| 4/1/96 -<br>9/30/96                           |                                    |                                     | \$                                 |                                     |                                    |                                    |                                      |                                     |                                    |
| 10/1/96 -<br>3/31/97                          |                                    |                                     | \$                                 |                                     |                                    |                                    |                                      |                                     |                                    |
| 4/1/97 -<br>9/30/97                           |                                    |                                     | \$                                 |                                     |                                    |                                    |                                      |                                     |                                    |
| Fixed Fee<br>(Ref. B.3)                       |                                    |                                     |                                    | \$                                  | \$                                 | \$                                 | \$                                   | \$                                  | \$                                 |
| Subcontracting<br>Plan (Exhibit D)            |                                    |                                     |                                    |                                     |                                    |                                    |                                      |                                     |                                    |
| Total Planned<br>Subcon-<br>tracting          | \$                                 | \$                                  | \$                                 |                                     |                                    |                                    |                                      |                                     |                                    |
| Small Business<br>(SB) Goal                   | \$                                 | \$                                  | \$                                 |                                     |                                    |                                    |                                      |                                     |                                    |
| Small Disadvantaged<br>Business (SDB)<br>Goal | \$                                 | \$                                  | \$                                 |                                     |                                    |                                    |                                      |                                     |                                    |

B. Priced Option - Additional Level of Effort and Other Direct Costs (ODC's)

1. The Contractor hereby grants to the Government options to increase the contract level of effort and the ODC limitation by the amounts specified below for each period. The Government's options may be exercised once or multiple times

in minimum increments of 1,875 hours of effort or \$5,000 in ODC's. Such options are to be exercisable by issuance of a unilateral modification.

|                             | <u>Level of Effort</u><br><u>(Ref. B.2)</u> | <u>ODC's</u><br><u>(Ref. B.3)</u> |
|-----------------------------|---|-----------------------------------|
| Initial<br>Period           | 31,875 hours                                | \$450,000                         |
| First<br>Option<br>Period   | 56,250 hours                                | \$450,000                         |
| Second<br>Option<br>Period  | 80,625 hours                                | \$450,000                         |
| Third<br>Option<br>Period   | 196,875 hours                               | \$900,000                         |
| Fourth<br>Option<br>Period  | 10,000 hours                                | \$ 37,500                         |
| Fifth<br>Option<br>Period   | 10,000 hours                                | \$ 37,500                         |
| Sixth<br>Option<br>Period   | 10,000 hours                                | \$ 37,500                         |
| Seventh<br>Option<br>Period | 10,000 hours                                | \$ 37,500                         |
| Eighth<br>Option<br>Period  | 10,000 hours                                | \$ 37,500                         |
| Ninth<br>Option<br>Period   | 10,000 hours                                | \$ 37,500                         |

2. When any increment of the above options is exercised, the contract cost and fee set forth in B.3, Estimated Cost, Award Fee, and Fixed Fee and the dollar goals set forth in Exhibit D, Subcontracting Plan will be increased using the appropriate rates set forth below:

|                |                | <u>Rate Per<br/>Hour</u> | <u>Rate Per<br/>ODC<br/>Limitation<br/>Dollar</u> | <u>Total Planned<br/>Subcontracting<br/>Per ODC<br/>Limitation<br/>Dollar</u> | <u>SB<br/>Goal</u> | <u>SDB<br/>Goal</u> |
|----------------|----------------|--------------------------|---|---|--------------------|---------------------|
| Initial Period | Cost Award Fee | \$                       | \$  | \$  | \$                 | \$                  |
| First Option   | Cost Award Fee | \$                       | \$  | \$  | \$                 | \$                  |
| Second Option  | Cost Award Fee | \$                       | \$  | \$  | \$                 | \$                  |
| Third Option   | Cost Award Fee | \$                       | \$  | \$  | \$                 | \$                  |
| Fourth Option  | Cost Fixed Fee | \$                       |   |   |                    |                     |
| Fifth Option   | Cost Fixed Fee | \$                       |   |   |                    |                     |
| Sixth Option   | Cost Fixed Fee | \$                       |   |   |                    |                     |
| Seventh Option | Cost Fixed Fee | \$                       |   |   |                    |                     |
| Eighth Option  | Cost Fixed Fee | \$                       |   |   |                    |                     |
| Ninth Option   | Cost Fixed Fee | \$                       |   |   |                    |                     |

3. Increases in the award fee will be allocated to the applicable award fee schedule period.

PART II - CONTRACT CLAUSES

SECTION I - CONTRACT CLAUSES

I.1 CLAUSES INCORPORATED BY REFERENCE (FAR 52.252-2) (JUN 1988)

This contract incorporates one or more clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available.



I.2 The following contract clauses are incorporated by reference:

FEDERAL ACQUISITION REGULATION (48 CFR CHAPTER 1) CLAUSES

| <u>CLAUSE NUMBER</u> | <u>TITLE AND DATE</u>   |
|----------------------|---|
| 52.202-1             | Definitions (APR 1984)  |
| 52.203-1             | Officials Not to Benefit (APR 1984)   |
| 52.203-3             | Gratuities (APR 1984)   |
| 52.203-5             | Covenant Against Contingent Fees (APR 1984)   |
| 52.203-6             | Restrictions on Subcontractor Sales to the Government<br>(JUL 1985)   |
| 52.203-7             | Anti-Kickback Procedures (OCT 1988)   |
| 52.203-10            | Price or Fee Adjustment for Illegal or Improper Activity<br>(SEP 1990)  |
| 52.204-2             | Security Requirements (APR 1984)  |
| 52.209-6             | Protecting the Government's Interest when Subcontracting with<br>Contractors Debarred, Suspended, or Proposed for Debarment<br>(JUN 1991) |
| 52.210-5             | New Material (APR 1984)   |
| 52.212-8             | Defense Priority and Allocation Requirements (MAY 1986)   |
| 52.215-1             | Examination of Records by Comptroller General (APR 1984)  |
| 52.215-2             | Audit - Negotiation (DEC 1989)  |
| 52.215-22            | Price Reduction for Defective Cost or Pricing Data (JAN 1991)   |
| 52.215-27            | Termination of Defined Benefit Pension Plans (SEP 1989)   |
| 52.215-33            | Order of Precedence (JAN 1986)  |
| 52.215-39            | Reversion or Adjustment of Plans for Postretirement<br>Benefits Other Than Pensions (JUL 1991)  |
| 52.216-7             | Allowable Cost and Payment (JUL 1991)   |
| 52.216-8             | Fixed Fee (APR 1984)  |
| 52.219-8             | Utilization of Small Business Concerns and Small Disadvantaged<br>Business Concerns (FEB 1990)  |
| 52.219-9             | Small Business and Small Disadvantaged Business Subcontracting<br>Plan (JAN 1991)   |
| 52.219-13            | Utilization of Women-Owned Small Businesses (AUG 1986)  |
| 52.219-16            | Liquidated Damages - Small Business Subcontracting Plan<br>(AUG 1989)   |
| 52.220-3             | Utilization of Labor Surplus Area Concerns (APR 1984)   |
| 52.220-4             | Labor Surplus Area Subcontracting Program (APR 1984)  |
| 52.222-1             | Notice to the Government of Labor Disputes (APR 1984)   |
| 52.222-3             | Convict Labor (APR 1984)  |
| 52.222-4             | Contract Work Hours and Safety Standards Act - Overtime<br>Compensation (MAR 1986)  |
| 52.222-26            | Equal Opportunity (APR 1984)  |
| 52.222-28            | Equal Opportunity Preaward Clearance of Subcontracts<br>(APR 1984)  |
| 52.222-35            | Affirmative Action for Special Disabled and Vietnam Era<br>Veterans (APR 1984)  |
| 52.222-36            | Affirmative Action for Handicapped Workers (APR 1984)   |
| 52.222-37            | Employment Reports on Special Disabled Veterans and<br>Veterans of the Vietnam Era (JAN 1989)   |
| 52.223-2             | Clean Air and Water (APR 1984)  |

52.223-3 Hazardous Material Identification and Material Safety Data (NOV 1991) Alternate I (NOV 1991)

52.225-11 Restrictions on Certain Foreign Purchases (APR 1991)

52.225-13 Restrictions on Contracting with Sanctioned Persons (APR 1991)

52.227-1 Authorization and Consent (APR 1984)

52.227-2 Notice and Assistance Regarding Patent and Copyright Infringement (APR 1984)

52.227-11 Patent Rights - Retention by the Contractor (Short Form) (JUN 1989)--as modified by NASA FAR Supplement 18-52.227-11

52.227-14 Rights in Data - General (JUN 1987) -- as modified by NASA FAR Supplement 18-52.227-14

52.228-7 Insurance - Liability to Third Persons (APR 1984)

52.230-3 Cost Accounting Standards (SEP 1987)

52.230-4 Administration of Cost Accounting Standards (SEP 1987)

52.232-9 Limitation on Withholding of Payments (APR 1984)

52.232-17 Interest (JAN 1991)

52.232-18 Availability of Funds (APR 1984)

52.232-22 Limitation of Funds (APR 1984)--as modified by NASA FAR Supplement 18-32.705-2

52.232-23 Assignment of Claims (JAN 1986)

52.232-28 Electronic Funds Transfer Payment Methods (APR 1989)--as modified by NASA FAR Supplement 18-32.908

52.233-1 Disputes (APR 1984) Alternate I (APR 1984)

52.233-3 Protest After Award (AUG 1989) Alternate I (JUN 1985)

52.237-2 Protection of Government Buildings, Equipment and Vegetation (APR 1984)

52.237-3 Continuity of Services (JAN 1991)

52.242-1 Notice of Intent to Disallow Costs (APR 1984)

52.243-2 Changes - Cost-Reimbursement (AUG 1987) Alternate II (APR 1984)

52.244-2 Subcontracts (Cost-Reimbursement and Letter Contracts) (JUL 1985) Alternate I (APR 1985)

52.244-5 Competition in Subcontracting (APR 1984)

52.245-5 Government Property (Cost-Reimbursement, Time-and-Material, or Labor-Hour Contracts) (JAN 1986)

52.246-25 Limitation of Liability - Services (APR 1984)

52.248-1 Value Engineering (MAR 1989)

52.249-6 Termination (Cost-Reimbursement) (MAY 1986)

52.249-14 Excusable Delays (APR 1984)

52.251-1 Government Supply Sources (APR 1984)

52.253-1 Computer Generated Forms (JAN 1991)

## NASA FAR SUPPLEMENT (48 CFR CHAPTER 18) CLAUSES

| <u>CLAUSE NUMBER</u> | <u>TITLE AND DATE</u>                                     |
|----------------------|---|
| 18-52.204-70         | Report on NASA Subcontracts (DEC 1988)                    |
| 18-52.204-71         | NASA Contractor Financial Management Reporting (DEC 1988) |
| 18-52.208-81         | Printing and Duplicating (JUN 1991)                       |
| 18-52.216-75         | Payment of Fixed Fee (DEC 1988)                           |
| 18-52.216-76         | Award Fee (DEC 1988)                                      |

|              |   |
|--------------|---|
| 18-52.219-74 | Use of Rural Area Small Businesses (SEP 1990)                     |
| 18-52.219-76 | NASA Small Disadvantaged Business Goal (JUL 1991)                 |
| 18-52.223-70 | Safety and Health (DEC 1988)                                      |
| 18-52.227-70 | New Technology (APR 1988)   |
| 18-52.227-71 | Requests for Waiver of Rights to Inventions (APR 1984)            |
| 18-52.228-75 | Minimum Insurance Coverage (OCT 1988)                             |
| 18-52.235-72 | Plan for New Technology Reporting (MAR 1989)                      |
| 18-52.237-70 | Emergency Evacuation Procedures (DEC 1988)                        |
| 18-52.242-72 | Observance of Legal Holidays (SEP 1989)<br>Alternate I (SEP 1989) |
| 18-52.245-70 | Acquisition of Centrally Reportable Equipment (MAR 1989)          |
| 18-52.245-71 | Installation-Provided Government Property (MAR 1989)              |
| 18-52.252-70 | Compliance with NASA FAR Supplement (MAR 1989)                    |

### I.3 CLAUSES IN FULL TEXT

The clauses listed below follow in full text:

|              |  |
|--------------|--|
| 52.203-9     | Requirement for Certificate of Procurement Integrity -<br>Modification (NOV 1990)    |
| 52.203-12    | Limitation on Payments to Influence Certain Federal<br>Transactions (JAN 1990)       |
| 52.204-1     | Approval of Contract (DEC 1989)  |
| 52.215-24    | Subcontractor Cost or Pricing Data (APR 1985) (Deviation)                            |
| 52.215-26    | Integrity of Unit Prices (APR 1991)  |
| 52.217-9     | Option to Extend the Term of the Contract (MAR 1989)                                 |
| 52.222-2     | Payment for Overtime Premiums (JUL 1990)   |
| 52.222-41    | Service Contract Act of 1965, as Amended (MAY 1989)                                  |
| 52.223-6     | Drug-Free Workplace (JUL 1990)   |
| 52.232-25    | Prompt Payment (APR 1989)  |
| 52.242-13    | Bankruptcy (APR 1991)  |
| 52.252-6     | Authorized Deviations in Clauses (APR 1984)  |
| 18-52.204-76 | Security Requirements for Unclassified Automated Information<br>Resources (JUN 1990) |
| 18-52.223-72 | Potentially Hazardous Items (DEC 1988)   |
| 18-52.245-73 | Financial Reporting of Government-Owned/Contractor-Held<br>Property (MAR 1989)       |

### I.4 REQUIREMENT FOR CERTIFICATE OF PROCUREMENT INTEGRITY--MODIFICATION (FAR 52.203-9) (NOV 1990)

(a) Definitions. The definitions set forth in FAR 3.104-4 are hereby incorporated in this clause.

(b) The Contractor agrees that it will execute the certification set forth in paragraph (c) of this clause when requested by the contracting officer in connection with the execution of any modification of this contract.

(c) Certification. As required in paragraph (b) of this clause, the officer or employee responsible for the modification proposal shall execute the following certification:

CERTIFICATE OF PROCUREMENT INTEGRITY--MODIFICATION (NOV 1990)

(1) I, \_\_\_\_\_, [Name of certifier]

am the officer or employee responsible for the preparation of this modification proposal and hereby certify that, to the best of my knowledge and belief, with the exception of any information described in this certification, I have no information concerning a violation or possible violation of subsections 27(a), (b), (d), or (f) of the Office of Federal Procurement Policy Act, as amended\* (41 U.S.C. 423), (hereinafter referred to as "the Act"), as implemented in the FAR, occurring during the conduct of this procurement

(contract and modification number).

(2) As required by subsection 27(e)(1)(B) of the Act, I further certify that, to the best of my knowledge and belief, each officer, employee, agent, representative, and consultant of \_\_\_\_\_

[Name of Offeror]

who has participated personally and substantially in the preparation or submission of this proposal has certified that he or she is familiar with, and will comply with, the requirements of subsection 27(a) of the Act, as implemented in the FAR, and will report immediately to me any information concerning a violation or possible violation of subsections 27(a), (b), (d), or (f) of the Act, as implemented in the FAR, pertaining to this procurement.

(3) Violations or possible violations: (Continue on plain bond paper if necessary and label Certificate of Procurement Integrity--Modification (Continuation Sheet), ENTER NONE IF NONE EXIST) \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

[Signature of the officer or employee responsible for the modification proposal and date]

[Typed name of the officer or employee responsible for the modification proposal]

\*Subsections 27(a), (b), and (d) are effective on December 1, 1990. Subsection 27(f) is effective on June 1, 1991.

THIS CERTIFICATION CONCERNS A MATTER WITHIN THE JURISDICTION OF AN AGENCY OF THE UNITED STATES AND THE MAKING OF A FALSE, FICTITIOUS, OR FRAUDULENT CERTIFICATION MAY RENDER THE MAKER SUBJECT TO PROSECUTION UNDER TITLE 18, UNITED STATES CODE, SECTION 1001.

(End of certification)

(d) In making the certification in paragraph (2) of the certificate, the officer or employee of the competing Contractor responsible for the offer or bid, may rely upon a one-time certification from each individual required to submit a certification to the competing contractor, supplemented by periodic training. These certifications shall be obtained at the earliest possible date after an individual required to certify begins employment or association with the contractor. If a contractor decides to rely on a certification executed prior to suspension of Section 27 (i.e., prior to December 1, 1989), the contractor shall ensure that an individual who has so certified is notified that Section 27 has been reinstated. These certifications shall be maintained by the Contractor for a period of 6 years from the date a certifying employee's employment with the company ends or, for an agency, representative, or consultant, 6 years from the date such individual ceases to act on behalf of the Contractor.

(e) The certification required by paragraph (c) of this clause is a material representation of fact upon which reliance will be placed in executing this modification.

#### I.5 LIMITATION ON PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS (FAR 52.203-12) (JAN 1990)

##### (a) Definitions.

"Agency," as used in this clause, means executive agency as defined in 2.101.

"Covered Federal action," as used in this clause, means any of the following Federal actions:

- (1) The awarding of any Federal contract.
- (2) The making of any Federal grant.
- (3) The making of any Federal loan.
- (4) The entering into of any cooperative agreement.
- (5) The extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

"Indian tribe" and "tribal organization," as used in this clause, have the meaning provided in section 4 of the Indian Self-Determination and Education Assistance Act (25 U.S.C. 450B) and include Alaskan Natives.

"Influencing or attempting to influence," as used in this clause, means making, with the intent to influence, any communication to or appearance before an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with any covered Federal action.

"Local government," as used in this clause, means a unit of government in a State and, if chartered, established, or otherwise recognized by a State for the performance of a governmental duty, including a local public authority, a special district, an intrastate district, a council of governments, a sponsor group representative organization, and any other instrumentality of a local government.

"Officer or employee of an agency," as used in this clause, includes the following individuals who are employed by an agency:

- (1) An individual who is appointed to a position in the Government under title 5, United States Code, including a position under a temporary appointment.
- (2) A member of the uniformed services, as defined in subsection 101(3), title 37, United States Code.
- (3) A special Government employee, as defined in section 202, title 18, United States Code.

(4) An individual who is a member of a Federal advisory committee, as defined by the Federal Advisory Committee Act, title 5, United States Code appendix 2.

"Person," as used in this clause, means an individual, corporation, company, association, authority, firm, partnership, society, State, and local government, regardless of whether such entity is operated for profit, or not for profit. This term excludes an Indian tribe, tribal organization, or any other Indian organization with respect to expenditures specifically permitted by other Federal law.

"Reasonable compensation," as used in this clause, means, with respect to a regularly employed officer or employee of any person, compensation that is consistent with the normal compensation for such officer or employee for work that is not furnished to, not funded by, or not furnished in cooperation with the Federal Government.

"Reasonable payment," as used in this clause, means, with respect to professional and other technical services, a payment in an amount that is consistent with the amount normally paid for such services in the private sector.

"Recipient," as used in this clause, includes the Contractor and all subcontractors. This term excludes an Indian tribe, tribal organization, or any other Indian organization with respect to expenditures specifically permitted by other Federal law.

"Regularly employed," as used in this clause, means, with respect to an officer or employee of a person requesting or receiving a Federal contract, an officer or employee who is employed by such person for at least 130 working days within one year immediately preceding the date of the submission that initiates agency consideration of such person for receipt of such contract. An officer or employee who is employed by such person for less than 130 working days within one year immediately preceding the date of the submission that initiates agency consideration of such person shall be considered to be regularly employed as soon as he or she is employed by such person for 130 working days.

"State," as used in this clause, means a State of the United States, the District of Columbia, the Commonwealth of Puerto Rico, a territory or possession of the United States, an agency or instrumentality of a State, and multi-State, regional, or interstate entity having governmental duties and powers.

(b) Prohibitions.

(1) Section 1352 of title 31, United States Code, among other things, prohibits a recipient of a Federal contract, grant, loan, or cooperative agreement from using appropriated funds to pay any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with any of the following covered Federal actions: the awarding of any Federal contract; the making of any Federal grant; the making of any Federal loan; the entering into of any cooperative agreement; or the modification of any Federal contract, grant, loan, or cooperative agreement.

(2) The Act also requires Contractors to furnish a disclosure if any funds other than Federal appropriated funds (including profit or fee received under a covered Federal transaction) have been paid, or will be paid, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with a Federal contract, grant, loan, or cooperative agreement.

(3) The prohibitions of the Act do not apply under the following conditions:

(i) Agency and legislative liaison by own employees.

(A) The prohibition on the use of appropriated funds, in subparagraph (b)(1) of this clause, does not apply in the case of a payment of reasonable compensation made to an officer or employee of a person requesting or receiving a covered Federal action if the payment is for agency and legislative liaison activities not directly related to a covered Federal action.

(B) For purposes of subdivision (b)(3)(i)(A) of this clause, providing any information specifically requested by an agency or Congress is permitted at any time.

(C) The following agency and legislative liaison activities are permitted at any time where they are not related to a specific solicitation for any covered Federal action:

(1) Discussing with an agency the qualities and characteristics (including individual demonstrations) of the person's products or services, conditions or terms of sale, and service capabilities.

(2) Technical discussions and other activities regarding the application or adaptation of the person's products or services for an agency's use.

(D) The following agency and legislative liaison activities are permitted where they are prior to formal solicitation of any covered Federal action -

(1) Providing any information not specifically requested but necessary for an agency to make an informed decision about initiation of a covered Federal action;

(2) Technical discussions regarding the preparation of an unsolicited proposal prior to its official submission; and

(3) Capability presentations by persons seeking awards from an agency pursuant to the provisions of the Small Business Act, as amended by Pub. L. 95-507, and subsequent amendments.

(E) Only those services expressly authorized by subdivision (b)(3)(i)(A) of this clause are permitted under this clause.

(ii) Professional and technical services.

(A) The prohibition on the use of appropriated funds, in subparagraph (b)(1) of this clause, does not apply in the case of -

(1) A payment of reasonable compensation made to an officer or employee of a person requesting or receiving a covered Federal action or an extension, continuation, renewal, amendment, or modification of a covered Federal action, if payment is for professional or technical services rendered directly in the preparation, submission, or negotiation of any bid, proposal, or application for that Federal action or for meeting requirements imposed by or pursuant to law as a condition for receiving that Federal action.

(2) Any reasonable payment to a person, other than an officer or employee of a person requesting or receiving a covered Federal action or an extension, continuation, renewal, amendment, or modification of a covered Federal action if the payment is for professional or technical services rendered directly in the preparation, submission, or negotiation of any bid, proposal, or application for that Federal action or for meeting requirements imposed by or pursuant to law as a condition for receiving that Federal action. Persons other than officers or employees of a person requesting or receiving a covered Federal action include consultants and trade associations.

(B) For purposes of subdivision (b)(3)(ii)(A) of this clause, "professional and technical services" shall be limited to advice and analysis directly applying any professional or technical discipline. For example, drafting of a legal document accompanying a bid or proposal by a lawyer is allowable. Similarly, technical advice provided by an engineer on the performance or operational capability of a piece of equipment rendered directly in the negotiation of a contract is allowable. However, communications with the intent to influence made by a professional (such as a licensed lawyer) or a technical person (such as a licensed accountant) are not allowable under this section unless they provide advice and analysis directly applying their professional or technical expertise and unless the advice or analysis is rendered directly and solely in the preparation, submission or negotiation of a covered Federal action. Thus, for example, communications with the intent to influence made by a lawyer that do not provide legal advice or analysis directly and solely related to the legal aspects of his or her client's proposal, but generally advocate one proposal over another are not allowable under this section because the lawyer is not providing professional legal services. Similarly, communications with the intent to influence made by an engineer providing an engineering analysis prior to the preparation or submission of a bid or proposal are not allowable under this section since the engineer is providing technical services but not directly in the preparation, submission or negotiation of a covered Federal action.

(C) Requirements imposed by or pursuant to law as a condition for receiving a covered Federal award include those required by law or regulation and any other requirements in the actual award documents.

(D) Only those services expressly authorized by subdivisions (b)(3)(ii)(A)(1) and (2) of this clause are permitted under this clause.

(E) The reporting requirements of FAR 3.803(a) shall not apply with respect to payments of reasonable compensation made to regularly employed officers or employees of a person.

(iii) Disclosure.

(A) The Contractor who requests or receives from an agency a Federal contract shall file with that agency a disclosure form, OMB standard form LLL, Disclosure of Lobbying Activities, if such person has made or has agreed to make any payment using nonappropriated funds (to include profits from any covered Federal action), which would be prohibited under subparagraph (b)(1) of this clause, if paid for with appropriated funds.

(B) The Contractor shall file a disclosure form at the end of each calendar quarter in which there occurs any event that materially affects the accuracy of the information contained in any disclosure form previously filed by such person under subparagraph (c)(1) of this clause. An event that materially affects the accuracy of the information reported includes -

(1) A cumulative increase of \$25,000 or more in the amount paid or expected to be paid for influencing or attempting to influence a covered Federal action; or

(2) A change in the person(s) or individual(s) influencing or attempting to influence a covered Federal action; or

(3) A change in the officer(s), employee(s), or Member(s) contacted to influence or attempt to influence a covered Federal action.

(C) The Contractor shall require the submittal of a certification, and if required, a disclosure form by any person who requests or receives any subcontract exceeding \$100,000 under the Federal contract.



(D) All subcontractor disclosure forms (but not certifications) shall be forwarded from tier to tier until received by the prime Contractor. The prime Contractor shall submit all disclosures to the Contracting Officer at the end of the calendar quarter in which the disclosure form is submitted by the subcontractor. Each subcontractor certification shall be retained in the subcontract file of the awarding Contractor.

(iv) Agreement. The Contractor agrees not to make any payment prohibited by this clause.

(v) Penalties.

(A) Any person who makes an expenditure prohibited under paragraph (a) of this clause or who fails to file or amend the disclosure form to be filed or amended by paragraph (b) of this clause shall be subject to civil penalties as provided for by 31 U.S.C. 1352. An imposition of a civil penalty does not prevent the Government from seeking any other remedy that may be applicable.

(B) Contractors may rely without liability on the representation made by their subcontractors in the certification and disclosure form.

(vi) Cost allowability. Nothing in this clause makes allowable or reasonable any costs which would otherwise be unallowable or unreasonable. Conversely, costs made specifically unallowable by the requirements in this clause will not be made allowable under any of the provisions.

#### I.6 APPROVAL OF CONTRACT (FAR 52.204-1) (DEC 1989)

This contract is subject to the written approval of Procurement Officer and shall not be binding until so approved.

#### I.7 SUBCONTRACTOR COST OR PRICING DATA (FAR 52.215-24) (APR 1985) (DEVIATION)

(a) Before awarding any subcontract expected to exceed \$500,000 when entered into, or before pricing any subcontract modification involving a pricing adjustment expected to exceed \$500,000, the Contractor shall require the subcontractor to submit cost or pricing data (actually or by specific identification in writing), unless the price is -

(1) Based on adequate price competition;

(2) Based on established catalog or market prices of commercial items sold in substantial quantities to the general public; or

(3) Set by law or regulation.

(b) The Contractor shall require the subcontractor to certify in substantially the form prescribed in Subsection 15.804-4 of the Federal Acquisition Regulation (FAR) that, to the best of its knowledge and belief, the data submitted under paragraph (a) above were accurate, complete, and current as of the date of agreement on the negotiated price of the subcontract or subcontract modification.

(c) In each subcontract that exceeds \$500,000 when entered into, the Contractor shall insert either -

(1) The substance of this clause, including this paragraph (c), if paragraph (a) above requires submission of cost or pricing data for the subcontract; or

(2) The substance of the clause at FAR 52.215-25, Subcontractor Cost or Pricing Data - Modifications.

## I.8 INTEGRITY OF UNIT PRICES (FAR 52.215-26) (APR 1991)

(a) Any proposal submitted for the negotiation of prices for items of supplies shall distribute costs within contracts on a basis that ensures that unit prices are in proportion to the items' base cost (e.g., manufacturing or acquisition costs). Any method of distributing costs to line items that distorts unit prices shall not be used. For example, distributing costs equally among line items is not acceptable except when there is little or no variation in base cost. Nothing in this paragraph requires submission of cost or pricing data not otherwise required by law or regulation.

(b) The requirement in paragraph (a) of this clause does not apply to any contract or subcontract item of supply for which the unit price is, or is based on, an established catalog or market price for a commercial item sold in substantial quantities to the general public. A price is based on a catalog or market price only if the item being purchased is sufficiently similar to the catalog or market price commercial item to ensure that any difference in price can be identified and justified without resort to cost analysis.

(c) The Offeror/Contractor shall also identify those supplies which it will not manufacture or to which it will not contribute significant value when requested by the Contracting Officer. The information shall not be required for commercial items sold in substantial quantities to the general public when the price is, or is based on, established catalog or market prices.

(d) The Contractor shall insert the substance of this clause, less paragraph (c), in all subcontracts.

## I.9 OPTION TO EXTEND THE TERM OF THE CONTRACT (FAR 52.217-9) (MAR 1989)

(a) The Government may extend the term of this contract by written notice to the Contractor within the time specified in the schedule; provided, that the Government shall give the Contractor a preliminary written notice of its intent to extend at least 60 days before the contract expires. The preliminary notice does not commit the Government to an extension.

(b) If the Government exercises this option, the extended contract shall be considered to include this option provision.

(c) The total duration of this contract, including the exercise of any options under this clause, shall not exceed 66 months.

## I.10 PAYMENT FOR OVERTIME PREMIUMS (FAR 52.222-2) (JUL 1990)

(a) The use of overtime is authorized under this contract if the overtime premium cost does not exceed zero or the overtime premium is paid for work -

(1) Necessary to cope with emergencies such as those resulting from accidents, natural disasters, breakdowns of production equipment, or occasional production bottlenecks of a sporadic nature;

(2) By indirect-labor employees such as those performing duties in connection with administration, protection, transportation, maintenance, standby plant protection, operation of utilities, or accounting;

(3) To perform tests, industrial processes, laboratory procedures, loading or unloading of transportation conveyances, and operations in flight or afloat that are continuous in nature and cannot reasonably be interrupted or completed otherwise; or

(4) That will result in lower overall costs to the Government.

(b) Any request for estimated overtime premiums that exceeds the amount specified above shall include all estimated overtime for contract completion and shall -

(1) Identify the work unit; e.g., department or section in which the requested overtime will be used, together with present workload, staffing, and other data of the affected unit sufficient to permit the Contracting Officer to evaluate the necessity for the overtime;

(2) Demonstrate the effect that denial of the request will have on the contract delivery or performance schedule;

(3) Identify the extent to which approval of overtime would affect the performance or payments in connection with other Government contracts, together with identification of each affected contract; and

(4) Provide reasons why the required work cannot be performed by using multishift operations or by employing additional personnel.

#### I.11 SERVICE CONTRACT ACT OF 1965, AS AMENDED (FAR 52.222-41) (MAY 1989)

(a) **Definitions.** "Act," as used in this clause, means the Service Contract Act of 1965, as amended (41 U.S.C. 351, et seq.).

"Contractor," as used in this clause or in any subcontract, shall be deemed to refer to the subcontractor, except in the term "Government Prime Contractor."

"Service employee," as used in this clause, means any person engaged in the performance of this contract other than any person employed in a bona fide executive, administrative, or professional capacity, as these terms are defined in Part 541 of Title 29, Code of Federal Regulations, as revised. It includes all such persons regardless of any contractual relationship that may be alleged to exist between a Contractor or subcontractor and such persons.

(b) **Applicability.** This contract is subject to the following provisions and to all other applicable provisions of the Act and regulations of the Secretary of Labor (29 CFR Part 4). This clause does not apply to contracts or subcontracts administratively exempted by the Secretary of Labor or exempted by 41 U.S.C. 356, as interpreted in Subpart C of 29 CFR Part 4.

(c) **Compensation.**

(1) Each service employee employed in the performance of this contract by the Contractor or any subcontractor shall be paid not less than the minimum monetary wages and shall be furnished fringe benefits in accordance with the wages and fringe benefits determined by the Secretary of Labor, or authorized representative, as specified in any wage determination attached to this contract.

(2) (i) If a wage determination is attached to this contract, the Contractor shall classify any class of service employee which is not listed therein and which is to be employed under this contract (i.e., the work to be performed is not performed by any classification listed in the wage determination) so as to provide a reasonable relationship (i.e., appropriate level of skill comparison) between such unlisted classifications and the classifications listed in the wage determination. Such conformed class of employees shall be paid the monetary wages and furnished the fringe benefits as are determined pursuant to the procedures in this paragraph (c).

(ii) This conforming procedure shall be initiated by the Contractor prior to the performance of contract work by the unlisted class of employee. The Contractor shall submit Standard Form (SF) 1444, Request For Authorization of Additional Classification and Rate, to the Contracting Officer no later than 30 days after the unlisted class of employee performs any contract

work. The Contracting Officer shall review the proposed classification and rate and promptly submit the completed SF 1444 (which must include information regarding the agreement or disagreement of the employees' authorized representatives or the employees themselves together with the agency recommendation), and all pertinent information to the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor. The Wage and Hour Division will approve, modify, or disapprove the action or render a final determination in the event of disagreement within 30 days of receipt or will notify the Contracting Officer within 30 days of receipt that additional time is necessary.

(iii) The final determination of the conformance action by the Wage and Hour Division shall be transmitted to the Contracting Officer who shall promptly notify the Contractor of the action taken. Each affected employee shall be furnished by the Contractor with a written copy of such determination or it shall be posted as a part of the wage determination.

(iv) (A) The process of establishing wage and fringe benefit rates that bear a reasonable relationship to those listed in a wage determination cannot be reduced to any single formula. The approach used may vary from wage determination to wage determination depending on the circumstances. Standard wage and salary administration practices which rank various job classifications by pay grade pursuant to point schemes or other job factors may, for example, be relied upon. Guidance may also be obtained from the way different jobs are rated under Federal pay systems (Federal Wage Board Pay System and the General Schedule) or from other wage determinations issued in the same locality. Basic to the establishment of any conformable wage rate(s) is the concept that a pay relationship should be maintained between job classifications based on the skill required and the duties performed.

(B) In the case of a contract modification, an exercise of an option, or extension of an existing contract, or in any other case where a Contractor succeeds a contract under which the classification in question was previously conformed pursuant to paragraph (c) of this clause, a new conformed wage rate and fringe benefits may be assigned to the conformed classification by indexing (i.e., adjusting) the previous conformed rate and fringe benefits by an amount equal to the average (mean) percentage increase (or decrease, where appropriate) between the wages and fringe benefits specified for all classifications to be used on the contract which are listed in the current wage determination, and those specified for the corresponding classifications in the previously applicable wage determination. Where conforming actions are accomplished in accordance with this paragraph prior to the performance of contract work by the unlisted class of employees, the Contractor shall advise the Contracting Officer of the action taken but the other procedures in subdivision (c)(ii) of this clause need not be followed.

(C) No employee engaged in performing work on this contract shall in any event be paid less than the currently applicable minimum wage specified under section 6(a)(1) of the Fair Labor Standards Act of 1938, as amended.

(v) The wage rate and fringe benefits finally determined under this subparagraph (c)(2) of this clause shall be paid to all employees performing in the classification from the first day on which contract work is performed by them in the classification. Failure to pay the unlisted employees the compensation agreed upon by the interested parties and/or finally determined by

the Wage and Hour Division retroactive to the date such class of employees commenced contract work shall be a violation of the Act and this contract.

(vi) Upon discovery of failure to comply with subparagraph (c)(2) of this clause, the Wage and Hour Division shall make a final determination of conformed classification, wage rate, and/or fringe benefits which shall be retroactive to the date such class or classes of employees commenced contract work.

(3) **Adjustment of Compensation.** If the term of this contract is more than 1 year, the minimum monetary wages and fringe benefits required to be paid or furnished thereunder to service employees under this contract shall be subject to adjustment after 1 year and not less often than once every 2 years, under wage determinations issued by the Wage and Hour Division.

(d) **Obligation to Furnish Fringe Benefits.** The Contractor or subcontractor may discharge the obligation to furnish fringe benefits specified in the attachment or determined under subparagraph (c)(2) of this clause by furnishing equivalent combinations of bona fide fringe benefits, or by making equivalent or differential cash payments, only in accordance with Subpart D of 29 CFR Part 4.

(e) **Minimum Wage.** In the absence of a minimum wage attachment for this contract, neither the Contractor nor any subcontractor under this contract shall pay any person performing work under this contract (regardless of whether the person is a service employee) less than the minimum wage specified by section 6(a)(1) of the Fair Labor Standards Act of 1938. Nothing in this clause shall relieve the Contractor or any subcontractor of any other obligation under law or contract for the payment of a higher wage to any employee.

(f) **Successor Contracts.** If this contract succeeds a contract subject to the Act under which substantially the same services were furnished in the same locality and service employees were paid wages and fringe benefits provided for in a collective bargaining agreement, in the absence of the minimum wage attachment for this contract setting forth such collectively bargained wage rates and fringe benefits, neither the Contractor nor any subcontractor under this contract shall pay any service employee performing any of the contract work (regardless of whether or not such employee was employed under the predecessor contract), less than the wages and fringe benefits provided for in such collective bargaining agreement, to which such employee would have been entitled if employed under the predecessor contract, including accrued wages and fringe benefits and any prospective increases in wages and fringe benefits provided for under such agreement. No Contractor or subcontractor under this contract may be relieved of the foregoing obligation unless the limitations of 29 CFR 4.1b(b) apply or unless the Secretary of Labor or the Secretary's authorized representative finds, after a hearing as provided in 29 CFR 4.10 that the wages and/or fringe benefits provided for in such agreement are substantially at variance with those which prevail for services of a character similar in the locality, or determines, as provided in 29 CFR 4.11, that the collective bargaining agreement applicable to service employees employed under the predecessor contract was not entered into as a result of arm's length negotiations. Where it is found in accordance with the review procedures provided in 29 CFR 4.10 and/or 4.11 and Parts 6 and 8 that some or all of the wages and/or fringe benefits contained in a predecessor Contractor's collective bargaining agreement are substantially at variance with those which prevail for services of a character similar in the locality, and/or that the collective bargaining agreement applicable to service employees employed under the predecessor contract was not entered into as a result of arm's length negotiations, the Department will issue a new or revised wage determination

setting forth the applicable wage rates and fringe benefits. Such determination shall be made part of the contract or subcontract, in accordance with the decision of the Administrator, the Administrative Law Judge, or the Board of Service Contract Appeals, as the case may be, irrespective of whether such issuance occurs prior to or after the award of a contract or subcontract (53 Comp. Gen. 401 (1973)). In the case of a wage determination issued solely as a result of a finding of substantial variance, such determination shall be effective as of the date of the final administrative decision.

(g) **Notification to Employees.** The Contractor and any subcontractor under this contract shall notify each service employee commencing work on this contract of the minimum monetary wage and any fringe benefits required to be paid pursuant to this contract, or shall post the wage determination attached to this contract. The poster provided by the Department of Labor (Publication WH 1313) shall be posted in a prominent and accessible place at the worksite. Failure to comply with this requirement is a violation of Section 2(a)(4) of the Act and of this contract.

(h) **Safe and Sanitary Working Conditions.** The Contractor or subcontractor shall not permit any part of the services called for by this contract to be performed in buildings or surroundings or under working conditions provided by or under the control or supervision of the Contractor or subcontractor which are unsanitary, hazardous, or dangerous to the health or safety of the service employees. The Contractor or subcontractor shall comply with the safety and health standards applied under 29 CFR Part 1925.

(i) **Records.** (1) The Contractor and each subcontractor performing work subject to the Act shall make and maintain for 3 years from the completion of the work, and make them available for inspection and transcription by authorized representatives of the Wage and Hour Division, Employment Standards Administration, a record of the following:

(i) For each employee subject to the Act -

(A) Name and address and social security number;

(B) Correct work classification or classifications, rate or rates of monetary wages paid and fringe benefits provided, rate or rates of payments in lieu of fringe benefits, and total daily and weekly compensation;

(C) Daily and weekly hours worked by each employee; and

(D) Any deductions, rebates, or refunds from the total daily or weekly compensation of each employee.

(ii) For those classes of service employees not included in any wage determination attached to this contract, wage rates or fringe benefits determined by the interested parties or by the Administrator or authorized representative, under the terms of paragraph (c) of this clause. A copy of the report required by subdivision (c)(2)(ii) of this clause will fulfill this requirement.

(iii) Any list of the predecessor Contractor's employees which had been furnished to the Contractor as prescribed by paragraph (n) of this clause.

(2) The Contractor shall also make available a copy of this contract for inspection or transcription by authorized representatives of the Wage and Hour Division.

(3) Failure to make and maintain or to make available these records for inspection and transcription shall be a violation of the regulations and this contract, and in the case of failure to produce these records, the Contracting Officer, upon direction of the Department of Labor and notification to the

Contractor, shall take action to cause suspension of any further payment or advance of funds until such violation ceases.

(4) The Contractor shall permit authorized representatives of the Wage and Hour Division to conduct interviews with employees at the worksite during normal working hours.

(j) **Pay Periods.** The Contractor shall unconditionally pay to each employee subject to the Act all wages due free and clear and without subsequent deduction (except as otherwise provided by law or Regulations, 29 CFR Part 4), rebate, or kickback on any account. These payments shall be made no later than one pay period following the end of the regular pay period in which the wages were earned or accrued. A pay period under this Act may not be of any duration longer than semi-monthly.

(k) **Withholding of Payment and Termination of Contract.** The Contracting Officer shall withhold or cause to be withheld from the Government Prime Contractor under this or any other Government contract with the Prime Contractor such sums as an appropriate official of the Department of Labor requests or such sums as the Contracting Officer decides may be necessary to pay underpaid employees employed by the Contractor or subcontractor. In the event of failure to pay any employees subject to the Act all or part of the wages or fringe benefits due under the Act, the Contracting Officer may, after authorization or by direction of the Department of Labor and written notification to the Contractor, take action to cause suspension of any further payment or advance of funds until such violations have ceased. Additionally, any failure to comply with the requirements of this clause may be grounds for termination of the right to proceed with the contract work. In such event, the Government may enter into other contracts or arrangements for completion of the work, charging the Contractor in default with any additional cost.

(l) **Subcontracts.** The Contractor agrees to insert this clause in all subcontracts subject to the Act.

(m) **Collective Bargaining Agreements Applicable to Service Employees.** If wages to be paid or fringe benefits to be furnished any service employees employed by the Government Prime Contractor or any subcontractor under the contract are provided for in a collective bargaining agreement which is or will be effective during any period in which the contract is being performed, the Government Prime Contractor shall report this fact to the Contracting Officer, together with full information as to the application and accrual of such wages and fringe benefits, including any prospective increases, to service employees engaged in work on the contract, and a copy of the collective bargaining agreement. Such report shall be made upon commencing performance of the contract, in the case of collective bargaining agreements effective at such time, and in the case of such agreements or provisions or amendments thereof effective at a later time during the period of contract performance such agreements shall be reported promptly after negotiation thereof.

(n) **Seniority List.** Not less than 10 days prior to completion of any contract being performed at a Federal facility where service employees may be retained in the performance of the succeeding contract and subject to a wage determination which contains vacation or other benefit provisions based upon length of service with a Contractor (predecessor) or successor (29 CFR Part 4.173), the incumbent Prime Contractor shall furnish the Contracting Officer a certified list of the names of all service employees on the Contractor's or subcontractor's payroll during the last month of contract performance. Such list shall also contain anniversary dates of employment on the contract either with the

current or predecessor Contractors of each such service employee. The Contracting Officer shall turn over such list to the successor Contractor at the commencement of the succeeding contract.

(o) **Rulings and Interpretations.** Rulings and interpretations of the Act are contained in Regulations, 29 CFR Part 4.

(p) **Contractor's Certification.**

(1) By entering into this contract, the Contractor (and officials thereof) certifies that neither it (nor he or she) nor any person or firm who has substantial interest in the Contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of the sanctions imposed under section 5 of the Act.

(2) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract under section 5 of the Act.

(3) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

(q) **Variations, Tolerances, and Exemptions Involving Employment.**

Notwithstanding any of the provisions in paragraphs (b) through (o) of this clause, the following employees may be employed in accordance with the following variations, tolerances, and exemptions, which the Secretary of Labor, pursuant to section 4(b) of the Act prior to its amendment by Public L. 92-473, found to be necessary and proper in the public interest or to avoid serious impairment of the conduct of Government business.

(1) Apprentices, student-learners, and workers whose earning capacity is impaired by age, physical or mental deficiency, or injury may be employed at wages lower than the minimum wages otherwise required by section 2(a)(1) or 2(b)(1) of the Act without diminishing any fringe benefits or cash payments in lieu thereof required under section 2(a)(2) of the Act, in accordance with the conditions and procedures prescribed for the employment of apprentices, student-learners, handicapped persons, and handicapped clients of sheltered workshops under Section 14 of the Fair Labor Standards Act of 1938, in the regulations issued by the Administrator (29 CFR Parts 520, 521, 524, and 525).

(2) The Administrator will issue certificates under the Act for the employment of apprentices, student-learners, handicapped persons, or handicapped clients of sheltered workshops not subject to the Fair Labor Standards Act of 1938, or subject to different minimum rates of pay under the two acts, authorizing appropriate rates of minimum wages (but without changing requirements concerning fringe benefits or supplementary cash payments in lieu thereof), applying procedures prescribed by the applicable regulations issued under the Fair Labor Standards Act of 1938 (29 CFR Parts 520, 521, 524, and 525).

(3) The Administrator will also withdraw, annul, or cancel such certificates in accordance with the regulations in 29 CFR Parts 525 and 528.

(r) **Apprentices.** Apprentices will be permitted to work at less than the predetermined rate for the work they perform when they are employed and individually registered in a bona fide apprenticeship program registered with a State Apprenticeship Agency which is recognized by the U.S. Department of Labor, or if no such recognized agency exists in a State, under a program registered with the Bureau of Apprenticeship and Training, Employment and Training Administration, U.S. Department of Labor. Any employee who is not registered as an apprentice in an approved program shall be paid the wage rate and fringe benefits contained in the applicable wage determination for the journeyman classification of work actually performed. The wage rates paid apprentices shall not be less than the wage rate for their level of progress set forth in the registered program,



expressed as the appropriate percentage of the journeyman's rate contained in the applicable wage determination. The allowable ratio of apprentices to journeymen employed on the contract work in any craft classification shall not be greater than the ratio permitted to the Contractor as to his entire work force under the registered program.

(s) **Tips.** An employee engaged in an occupation in which the employee customarily and regularly receives more than \$30 a month in tips may have the amount of tips credited by the employer against the minimum wage required by section 2(a)(1) or section 2(b)(1) of the Act, in accordance with section 3(m) of the Fair Labor Standards Act and Regulations 29 CFR Part 531. However, that the amount of credit shall not exceed \$1.34 per hour beginning January 1, 1981. To use this provision -

(1) The employer must inform tipped employees about this tip credit allowance before the credit is utilized;

(2) The employees must be allowed to retain all tips (individually or through a pooling arrangement and regardless of whether the employer elects to take a credit for tips received);

(3) The employer must be able to show by records that the employee receives at least the applicable Service Contract Act minimum wage through the combination of direct wages and tip credit; and

(4) The use of such tip credit must have been permitted under any predecessor collective bargaining agreement applicable by virtue of section 4(c) of the Act.

(t) **Disputes Concerning Labor Standards.** The U.S. Department of Labor has set forth in 29 CFR Parts 4, 6, and 8 procedures for resolving disputes concerning labor standards requirements. Such disputes shall be resolved in accordance with those procedures and not the Disputes clause of this contract. Disputes within the meaning of this clause include disputes between the Contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

#### I.12 DRUG-FREE WORKPLACE (FAR 52.223-6) (JUL 1990)

(a) **Definitions.** As used in this clause,

"Controlled substance" means a controlled substance in Schedules I through V of Section 202 of the Controlled Substances Act (21 U.S.C. 812) and as further defined in regulation at 21 CFR 1308.11 - 1308.15.

"Conviction" means a finding of guilt (including a plea of nolo contendere) or imposition of sentence, or both, by any judicial body charged with the responsibility to determine violations of the Federal or State criminal drug statutes.

"Criminal drug statute" means a Federal or non-Federal criminal statute involving the manufacture, distribution, dispensing, possession or use of any controlled substance.

"Drug-free workplace" means the site(s) for the performance of work done by the Contractor in connection with a specific contract at which employees of the Contractor are prohibited from engaging in the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance.

"Employee" means an employee of a Contractor directly engaged in the performance of work under a Government contract. "Directly engaged" is defined to include all direct cost employees and any other Contractor employee who has other than a minimal impact or involvement in contract performance.

"Individual" means an offeror/Contractor that has no more than one employee including the offeror/Contractor.

(b) The Contractor, if other than an individual, shall - within 30 calendar days after award (unless a longer period is agreed to in writing for contracts of 30 calendar days or more performance duration); or as soon as possible for contracts of less than 30 calendar days performance duration -

(1) Publish a statement notifying its employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the Contractor's workplace and specifying the actions that will be taken against employees for violations of such prohibition;

(2) Establish an ongoing drug-free awareness program to inform such employees about -

(i) The dangers of drug abuse in the workplace;

(ii) The Contractor's policy of maintaining a drug-free workplace;

(iii) Any available drug counseling, rehabilitation, and employee assistance programs; and

(iv) The penalties that may be imposed upon employees for drug abuse violations occurring in the workplace.

(3) Provide all employees engaged in performance of the contract with a copy of the statement required by subparagraph (b)(1) of this clause;

(4) Notify such employees in writing in the statement required by subparagraph (b)(1) of this clause that, as a condition of continued employment on this contract, the employee will -

(i) Abide by the terms of the statement; and

(ii) Notify the employer in writing of the employee's conviction under a criminal drug statute for a violation occurring in the workplace no later than 5 days after such conviction.

(5) Notify the Contracting Officer in writing within 10 calendar days after receiving notice under subdivision (b)(4)(ii) of this clause, from an employee or otherwise receiving actual notice of such conviction. The notice shall include the position title of the employee;

(6) Within 30 calendar days after receiving notice under subdivision (b)(4)(ii) of this clause of a conviction, take one of the following actions with respect to any employee who is convicted of a drug abuse violation occurring in the workplace:

(i) Taking appropriate personnel action against such employee, up to and including termination; or

(ii) Require such employee to satisfactorily participate in a drug abuse assistance or rehabilitation program approved for such purposes by a Federal, State, or local health, law enforcement, or other appropriate agency.

(7) Make a good faith effort to maintain a drug-free workplace through implementation of subparagraphs (b)(1) through (b)(6) of this clause.

(c) The Contractor, if an individual, agrees by award of the contract or acceptance of a purchase order, not to engage in the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance in the performance of this contract.

(d) In addition to other remedies available to the Government, the Contractor's failure to comply with the requirements of paragraphs (b) or (c) of this clause may, pursuant to FAR 23.506, render the Contractor subject to suspension of contract payments, termination of the contract for default, and suspension or debarment.

## I.13 PROMPT PAYMENT (FAR 52.232-25) (APR 1989)

Notwithstanding any other payment clause in this contract, the Government will make invoice payments and contract financing payments under the terms and conditions specified in this clause. Payment shall be considered as being made on the day a check is dated or an electronic funds transfer is made. Definitions of pertinent terms are set forth in 32.902. All days referred to in this clause are calendar days, unless otherwise specified. The term "foreign vendor" means an incorporated concern not incorporated in the United States, or an unincorporated concern having its principal place of business outside the United States.

(a) Invoice Payments.

(1) For purposes of this clause, "invoice payment" means a Government disbursement of monies to a Contractor under a contract or other authorization for supplies or services accepted by the Government. This includes payments for partial deliveries that have been accepted by the Government and final cost or fee payments where amounts owed have been settled between the Government and the Contractor.

(2) Except as indicated in subparagraph (a)(3) and paragraph (c) of this clause, the due date for making invoice payments by the designated payment office shall be the later of the following two events:

(i) The 30th day after the designated billing office has received a proper invoice from the Contractor.

(ii) The 30th day after Government acceptance of supplies delivered or services performed by the Contractor. On a final invoice where the payment amount is subject to contract settlement actions, acceptance shall be deemed to have occurred on the effective date of the contract settlement. However, if the designated billing office fails to annotate the invoice with the actual date of receipt, the invoice payment due date shall be deemed to be the 30th day after the date the Contractor's invoice is dated, provided a proper invoice is received and there is no disagreement over quantity, quality, or Contractor compliance with contract requirements.

(3) The due date on contracts for meat and meat food products, contracts for perishable agricultural commodities, contracts for dairy products, edible fats or oils, and food products prepared from edible fats or oils, and contracts not requiring submission of an invoice shall be as follows:

(i) The due date for meat and meat food products, as defined in Section 2(a)(3) of the Packers and Stockyard Act of 1921 (7 U.S.C. 182(3)) and further defined in Pub. L. 98-181 to include any edible fresh or frozen poultry meat, any perishable poultry meat food product, fresh eggs, and any perishable egg product, will be as close as possible to, but not later than, the 7th day after product delivery.

(ii) The due date for perishable agricultural commodities, as defined in Section 1(4) of the Perishable Agricultural Commodities Act of 1930 (7 U.S.C. 499a(44)), will be as close as possible to, but not later than, the 10th day after product delivery, unless another date is specified in the contract.

(iii) The due date for dairy products, as defined in section 111(e) of the Dairy Production Stabilization Act of 1983 (7 U.S.C. 4502(e)), edible fats or oils, and food products prepared from edible fats or oils, will be as close as possible to, but not later than, the 10th day after the date on which a proper invoice has been received.

(4) An invoice is the Contractor's bill or written request for payment under the contract for supplies delivered or services performed. An invoice shall be

prepared and submitted to the designated billing office specified in the contract. A proper invoice must include the items listed in subdivisions (a)(4)(i) through (a)(4)(viii) of this clause.

If the invoice does not comply with these requirements, then the Contractor will be notified of the defect within 7 days after receipt of the invoice at the designated billing office (3 days for meat and meat food products and 5 days for perishable agricultural commodities, edible fats or oils, and food products prepared from edible fats or oils.

Untimely notification will be taken into account in the computation of any interest penalty owed the Contractor in the manner described in subparagraph (a)(6) of this clause.

- (i) Name and address of the Contractor.
- (ii) Invoice date.
- (iii) Contract number or other authorization for supplies delivered or services performed (including order number and contract line item number).
- (iv) Description, quantity, unit of measure, unit price, and extended price of supplies delivered or services performed.
- (v) Shipping and payment terms (e.g., shipment number and date of shipment, prompt payment discount terms). Bill of lading number and weight of shipment will be shown for shipments on Government bills of lading.
- (vi) Name and address of Contractor official to whom payment is to be sent (must be the same as that in the contract or in a proper notice of assignment).
- (vii) Name (where practicable), title, phone number and mailing address of person to be notified in event of a defective invoice.
- (viii) Any other information or documentation required by other requirements of the contract (such as evidence of shipment).

(5) An interest penalty shall be paid automatically by the Government, without request from the Contractor, if payment is not made by the due date and the conditions listed in subdivisions (a)(5)(i) through (a)(5)(iii) of this clause are met, if applicable. An interest penalty shall not be paid on contracts awarded to foreign vendors outside the United States for work performed outside the United States.

- (i) A proper invoice was received by the designated billing office.
- (ii) A receiving report or other Government documentation authorizing payment was processed and there was no disagreement over quantity, quality, or Contractor compliance with any contract term or condition.
- (iii) In the case of a final invoice for any balance of funds due the Contractor for supplies delivered or services performed, the amount was not subject to further contract settlement actions between the Government and the Contractor.

(6) The interest penalty shall be at the rate established by the Secretary of the Treasury under Section 12 of the Contract Disputes Act of 1978 (41 U.S.C. 611) that is in effect on the day after the due date, except where the interest penalty is prescribed by other governmental authority.

This rate is referred to as the "Renegotiation Board Interest Rate," and it is published in the Federal Register semiannually on or about January 1 and July 1. The interest penalty shall accrue daily on the invoice payment amount approved by the Government and be compounded in 30-day increments inclusive from the first day after the due date through the payment date. That is, interest accrued at the end of any 30-day period will be added to the approved invoice payment amount and be subject to interest penalties if not paid in the succeeding

30-day period. If the designated billing office failed to notify the Contractor of a defective invoice within the periods prescribed in paragraph (a)(4) of this clause, then the due date on the corrected invoice will be adjusted by subtracting the number of days taken beyond the prescribed notification of defects period. Any interest penalty owed the Contractor will be based on this adjusted due date. Adjustments will be made by the designated payment office for errors in calculating interest penalties, if requested by the Contractor.

(i) For the sole purpose of computing an interest penalty that might be due the Contractor, Government acceptance shall be deemed to have occurred constructively on the 7th day (unless otherwise specified in this contract) after the Contractor delivered the supplies or performed the services in accordance with the terms and conditions of the contract, unless there is a disagreement over quantity, quality, or Contractor compliance with a contract provision. In the event that actual acceptance occurs within the constructive acceptance period, the determination of an interest penalty shall be based on the actual date of acceptance.

The constructive acceptance requirement does not, however, compel Government officials to accept supplies or services, perform contract administration functions, or make payment prior to fulfilling their responsibilities.

(ii) The following periods of time will not be included in the determination of an interest penalty:

(A) The period taken to notify the Contractor of defects in invoices submitted to the Government, but this may not exceed 7 days (3 days for meat and meat food products and 5 days for perishable agricultural commodities, dairy products, edible fats or oils, and food products prepared from edible fats or oils).

(B) The period between the defects notice and resubmission of the corrected invoice by the Contractor.

(iii) Interest penalties will not continue to accrue after the filing of a claim for such penalties under the clause at 52.233-1, Disputes, or for more than 1 year. Interest penalties of less than \$1.00 need not be paid.

(iv) Interest penalties are not required on payment delays due to disagreement between the Government and Contractor over the payment amount or other issues involving contract compliance or on amounts temporarily withheld or retained in accordance with the terms of the contract. Claims involving disputes, and any interest that may be payable, will be resolved in accordance with the clause at 52.233-1, Disputes.

(7) An interest penalty shall also be paid automatically by the designated payment office, without request from the Contractor, if a discount for prompt payment is taken improperly. The interest penalty will be calculated as described in subparagraph (a)(6) of this clause on the amount of discount taken for the period beginning with the first day after the end of the discount period through the date when the Contractor is paid.

(8) If this contract was awarded on or after October 1, 1989, a penalty amount, calculated in accordance with regulations issued by the Office of Management and Budget, shall be paid in addition to the interest penalty amount if the Contractor -

- (i) Is owed an interest penalty;
- (ii) Is not paid the interest penalty within 10 days after the date the invoice amount is paid; and
- (iii) Makes a written demand, not later than 40 days after the date the invoice amount is paid, that the agency pay such a penalty.

(b) Contract Financing Payments.

(1) For purposes of this clause, "contract financing payment" means a Government disbursement of monies to a Contractor under a contract clause or other authorization prior to acceptance of supplies or services by the Government. Contract financing payments include advance payments, progress payments based on cost under the clause at 52.232-16, Progress Payments, progress payments based on a percentage or stage of completion (32.102(e)(1)) other than those made under the clause at 52.232-5, Payments Under Fixed-Price Construction Contracts, or the clause at 52.232-10, Payments Under Fixed-Price Architect-Engineer Contracts, and interim payments on cost type contracts.

(2) For contracts that provide for contract financing, requests for payment shall be submitted to the designated billing office as specified in this contract or as directed by the Contracting Officer. Contract financing payments shall be made on the 30th day after receipt of a proper contract financing request by the designated billing office. In the event that an audit or other review of a specific financing request is required to ensure compliance with the terms and conditions of the contract, the designated payment office is not compelled to make payment by the due date specified.

(3) For advance payments, loans, or other arrangements that do not involve recurrent submissions of contract financing requests, payment shall be made in accordance with the corresponding contract terms or as directed by the Contracting Officer.

(4) Contract financing payments shall not be assessed an interest penalty for payment delays.

(c) If this contract contains the clause at 52.213-1, Fast Payment Procedure, payments will be made within 15 days after the date of receipt of the invoice.

I.14 BANKRUPTCY (FAR 52.242-13) (APR 1991)

In the event the Contractor enters into proceedings relating to bankruptcy, whether voluntary or involuntary, the Contractor agrees to furnish, by certified mail, written notification of the bankruptcy to the Contracting Officer responsible for administering the contract. This notification shall be furnished within five days of the initiation of the proceedings relating to bankruptcy filing. This notification shall include the date on which the bankruptcy petition was filed, the identity of the court in which the bankruptcy petition was filed, and a listing of Government contract numbers and contracting offices for all Government contracts against which final payment has not been made. This obligation remains in effect until final payment under this contract.

I.15 AUTHORIZED DEVIATIONS IN CLAUSES (FAR 52.252-6) (APR 1984)

(a) The use in this solicitation or contract of any Federal Acquisition Regulation (48 CFR Chapter 1) clause with an authorized deviation is indicated by the addition of "(DEVIATION)" after the date of the clause.

(b) The use in this solicitation or contract of any NASA/FAR Supplement (48 CFR Chapter 18) clause with an authorized deviation is indicated by the addition of "(DEVIATION)" after the name of the regulation.

NASA, Langley Research Center  
Attn: Industrial Property Office, M/S 377  
Hampton, VA 23665-5225

(c) The annual reporting period shall be from July 1 of each year to June 30 of the following year.

(d) The Contractor agrees to insert the reporting requirement in all first-tier subcontracts, except that the requirement shall provide for the submission of the subcontractors' reports to the Contractor, not to the Government. The Contractor shall require the subcontractors' reports to be submitted in sufficient time to meet the reporting date in paragraph (c) above.

(e) The Contractor's report shall consist of a consolidation of the subcontractors' reports and the Contractor's own report.

## PART III - LIST OF DOCUMENTS, EXHIBITS AND OTHER ATTACHMENTS

SECTION J - LIST OF ATTACHMENTS

- Exhibit A Contract Documentation Requirements, 7 pages
- Exhibit B Register of Wage Determinations and Fringe Benefits, 78-1030, Rev. 21, September 18, 1991, 24 pages
- Exhibit C Contract Security Classification Specification, DD Form 254, 2 pages
- Exhibit D \*Subcontracting Plan, pages

The following are located behind Section M.

- Attachment 1 Government Estimated Staffing and Position Qualifications  
18 pages
- Attachment 2 Key Personnel Requirements, 2 pages
- Attachment 3 Representative Work Order Problems #1 - #10, 11 pages
- Attachment 4 Government Equipment to be Furnished Under a Facility Contract,  
60 pages
- Attachment 5 Cost Proposal Forms A through C (examples), 3 pages
- Attachment 6 Certificate of Current Cost or Pricing Data, Form PROC./P-281,  
May 1986, 1 page
- Attachment 7 Contract Pricing Proposal Cover Sheet, Standard Form 1411,  
July 1987 with instructions, 4 pages
- Attachment 8 Quarterly Listing of Contractor - Acquired Property, AD Form PROC.  
300, August 1990, 1 page
- Attachment 9 Index of Reference Documentation Contained in Bidder's Library,  
2 pages
- Attachment 10 Instrument Research Division Instruction 91-1 (Procedures for  
Receipt and Inspection Functions at Contractor-Operated  
Facility), 24 pages
- Attachment 11 Langley Handbook (LHB) 5330.9, Langley Research Center (LaRC)  
Metrology Program (October 1986), 19 pages
- Attachment 12 Langley Management Instructions (LMI) 5330.9, Metrology  
and Calibration (January 10, 1991), 7 pages
- Attachment 13 Contractor-Furnished Facility Requirements, 2 pages
- Attachment 14 FAR Provision 52.203-8, Requirement for Certificate of Procurement  
Integrity (NOV 1990) Alternate I (SEP 1990), 2 pages

\*Not applicable to small businesses.



EXHIBIT A  
CONTRACT DOCUMENTATION REQUIREMENTS

EXHIBIT A - CONTRACT DOCUMENTATION REQUIREMENTS

## I. DOCUMENTATION PREPARATION/SUBMISSION INSTRUCTIONS

A. Financial Management Reports--The Contractor shall comply with the Section I clause of this contract entitled "NASA Financial Management Reporting" by monthly submission of NASA Form 533M. The form shall be prepared and submitted in accordance with the instructions set forth on the reverse side of the form and NASA Handbook "Procedures for Contractor Reporting of Correlated Cost and Performance Data" (NHB 9501.2) as further definitized below.

1. Due not later than the tenth (10th) operating day following the close of the Contractor's accounting month being reported.

2. Columns 7.b. and d. shall be completed using the time-phased financial baseline plan approved as part of the Management and Operations Plan.

3. Columns 8.a. and b. shall be completed using estimates (forecasts) for the succeeding two (2) months.

4. Minimum reporting categories:

To Be Negotiated

5. Each 533M shall include a narrative explanation for monthly variances exceeding 10 percent between planned hours and dollars and actual hours and dollars for each reporting category.

B. Quarterly Financial Management Report--The Contractor shall submit a quarterly financial report detailed by categories specified in A.4. above on NASA Form 533Q at times and in accordance with the instructions contained on the reverse side of the form.

C. Award Fee Period Analysis--With 10 working days after the conclusion of each award fee evaluation period, the Contractor shall submit an analysis of actual versus planned costs and hours for each of the categories described in the above Financial Management Reports section. This analysis shall be for the award fee evaluation period only, and shall consist of only total contract values (not for each work order). A narrative explanation for each significant variance shall also be included.

D. Management and Operations Plan--Within fifteen (15) calendar days after contract award, the Contractor shall submit for the Contracting Officer's approval a comprehensive Management and Operations Plan containing, as a minimum, the following:

1. Continuing Plan--Detailed plans for maintaining competent staffing at each organizational level. These plans shall include the methods to be employed in accommodating fluctuating workloads, for backup arrangements to accommodate personnel absences, for personnel training and for recruiting replacements and additional personnel. Include management policies which contribute to employee retention, morale and productivity, such as career development, fringe benefits,

leave, salary, employee recognition, and recognizing and correcting morale problems.

2. Technical Operations Plan--Plans for organizing, assigning resources, and performing each task area outlined in the Statement of Work; tracking and controlling the work; recognizing and reporting technical problems and schedule slippages and follow-up on reported problems. In addition, include a brief description of: the proposed method of controlling actual versus planned costs; procurement functions to be performed at the Contractor's facility/home office; your purchasing practices and procedures; plans for selecting, monitoring and administering any proposed subcontract effort; and plans for maintaining operational status of Contractor-furnished Items and Government-furnished Equipment.

3. Contractor's Facility--Location, general description, and interior layout of the facility, including lease and/or purchase agreements, the method planned for maintaining full operational capability of the facility.

4. Organization--An organization chart and narrative describing the proposed organization, Contractor/Government interfaces, lines of authority within the organization, and responsibilities and authority of the Key Personnel including a discussion of the proposed managerial authority, autonomy and relationship with the "home office", if applicable.

5. Financial Baseline Plan--A time-phased financial baseline plan, detailing by month how you plan to incur costs for the period, shall be submitted for the initial contract period (12-months). Financial baseline plans for each of the remaining option periods (except for the six 1-month option periods) shall be submitted within 10 days of the anniversary of the effective date of this contract. Financial baseline plan revisions resulting from the exercise of priced option hours or ODC's shall be submitted 10 days following the effective date of the option being exercised. This plan shall include the periods by the cost categories specified in Paragraph A.4. above. The total estimated cost and level of effort reflected in the baseline plans must equal the contract values for the total contract period.

The Management and Operations Plan shall be updated as required during the contract performance by submission of revised pages for approval of the Contracting Officer.

E. Safety and Health Plan--Within 30 calendar days after the effective date of the contract, the Contractor shall submit a detailed safety and health plan showing how the Contractor intends to protect the life, health, and well being of NASA and Contractor employees as well as property and equipment. This plan, as approved by the Contracting Officer, shall be in accordance with NASA FAR Supplement 18-52.223-73 and should contain, as a minimum, the following:

1. Points of Contact and Responsibility - Organizational flow chart and description of responsibilities of each employee in your organization for safety.

2. Employee Safety Training, Certification and Programs - Detailed information on type of training required, parties responsible for certification,

and outline of applicable regulations. Detail company programs which emphasize personal safety and motivate employees to be safety conscious.

3. LaRC Safety Policies/Procedures - Recognition of applicable LaRC safety policies and procedures such as Langley Handbook 1710.10, LaRC Red Tag System.

4. Accident Investigation and Reporting - Procedures for investigating and reporting accidents/incidents including immediate notification to the NASA LaRC Safety Manager of all injuries and damage to equipment or facilities.

5. Hazardous Operations -

(a) Description of hazardous operations involved in contract performance.

(b) Plans for apprising employees of all hazards to which they may be exposed.

(c) Proper conditions and precautions for safe use and exposure to hazardous operations. Include recognition of LHB 1710.12, Potentially Hazardous Materials.

6. Equipment Inspection/Repair - Procedures for equipment safety inspection and repair.

7. Other Safety Considerations - Any other safety considerations unique to your operation.

F. Quarterly Accident/Injury Report--The Contractor shall submit a Quarterly Accident/Injury Report within ten (10) days after the end of each quarter.

G. Conformable Wage Rate Agreement--Within fifteen (15) days after the effective date of the contract, the Contractor shall submit a report confirming conformable wage rate agreement as this subject is addressed in the Section I clause entitled "Service Contract Act of 1965," for those individuals employed by the Contractor who are covered by the Service Contract Act, but are not listed in Exhibit .

H. Collective Bargaining Agreements--The Contractor shall provide the Contracting Officer with copies of any collective bargaining agreements, and amendments thereto, which arise during the course of the contract and which apply to Contractor employees assigned to the contract.

I. Report of Government-Owned/Contractor Held Property (NASA FORM 1018)--The Contractor shall submit the NASA Form 1018 no later than July 31 of each year in accordance with the Section I clause entitled "Financial Reporting of Government-owned/Contractor-held Property."

#### J. Documentation for Transferring Property to the Government

In accordance with the Installation-Provided Government Property clause of this contract, accountability for that property which is acquired for the Government under this contract shall be passed to the Government as using the following procedure:

(a) Property Utilized in the Performance of this Contract at Langley Research Center. The transfer of accountability shall be initiated by the Contractor submitting a Requisition and Invoice/Shipping Document, DD Form 1149, accompanied by a copy of the Contractor's applicable purchasing document for the property. The Contractor shall insert both the Contractor's Subcontract/ Purchase Order number and the Government contract number of the DD Form 1149 under the "Federal Stock Number, Description, and Coding of Material and/or Services" block. If the property is delivered to Langley Research Center, the DD 1149 and the supporting documentation must be submitted within 5 workdays after acceptance of the item by the Contractor. If the property is to be transferred from another location to Langley Research Center, the DD 1149 and other documents must be submitted prior to delivery of the property to the Government. Receipt by the Contractor of a copy of the DD 1149 signed by the Government relieves the Contractor of accountability for the property specified on that form.

(b) Other Deliverable Property. For all other property specified as a deliverable under this contract, including property delivered under any work orders or task assignments issued under the contract, the Contractor shall submit a completed Material and Inspection and Receiving Report, DD Form 250, upon delivery.

K. Quarterly List of Contractor-Acquired Government Property (PROC. Form P-300 - Within 30 days after the end of each calendar-year quarter (that is, not later than January 30, April 30, July 30, and October 30), the Contractor shall submit on a P-300 (or in a format containing equivalent data) a list of equipment and materials (in lots as applicable) acquired during that quarter by the Contractor for the Government's account, including all property previously reported on DD Forms 1149, Requisition and Invoice/Shipping Document. Each item or lot shall be assigned a consecutive item number which shall remain assigned to the same item or lot throughout the life of the contract. If no equipment or materials were acquired during a quarter, the Contractor shall submit a negative report.

L. Subcontracting Reports--The Contractor shall submit Standard Form 294, Subcontracting Report for Individual Contracts, Standard Form 295, Summary Subcontractor Report, and NASA Form 667, Report on NASA Subcontracts, in accordance with the instructions on the reverse of the form.

M. Report on NASA Subcontracts (NASA Form 667)--The Contractor shall submit this report in accordance with the instructions on the form.

N. Skill Mix and Wage Report--Within 30 calendar days after the effective date of this contract, the Contractor shall furnish to the Government a skill mix and wage report that includes company position titles and current hourly rates. Unless new or additional, any company job titles that differ from the Government

job titles specified in Attachment 1 of the RFP shall be cross-referenced to the Government job titles.

Within 30 calendar days after the end of each contract year, the Contractor shall furnish to the Government a follow-up report that includes the foregoing information plus the percentage (if any) each labor rate has escalated since the last report, an explanation by position of those escalations which exceed \* percent since the last report, and the amount of cash awards or bonuses (if any).

O. Biweekly Manpower Report--On a biweekly basis, the Contractor shall submit a man-hour utilization report illustrating the actual man-hours expended against each assigned work order.

P. Monthly Progress Report--The Contractor shall submit a monthly progress report summarizing work progress, manpower utilization, and material expenditures for assigned work orders. This report shall be submitted within 10 days following the end of the reporting period, and shall comply with the format as dictated by the Management and Operations Plan. The Government will meet with the Contractor for review and discussion of this report. A monthly report is not required when a quarterly report is due provided that the quarterly report covers the last month of the quarter at the level of detail required in the monthly report.

Q. Quarterly Progress Report--The Contractor shall submit a Quarterly Progress Report summarizing work progress and trends, manpower utilization for assigned work orders, material expenditures, and successful and unsuccessful work order accomplishments with backup explanations.

R. Semiannual Equipment Report--The Contractor shall submit a Semiannual Government-Furnished Equipment Report summarizing maintenance/calibration performed on the equipment.

S. Monthly Staffing Report--The Contractor shall submit a monthly report listing the staffing for that month for each organizational task area.

T. Monthly Management Reports--On a monthly basis, the Contractor shall submit a management report consisting of the following information which shall be reported separately:

1. Monthly Purchase Authorization Summary--Describe purchases of materials, repair parts, and services for the preceding month.

2. Monthly Travel Cost Summary--A summary of travel costs (by element) associated with lidar and acoustics support.

\*To be negotiated.

II. DOCUMENT DISTRIBUTION REQUIREMENTS--ALTERNATE I (LaRC 52.210-96)  
(JUN 1988)

A. Unless otherwise specified elsewhere in this contract, reports and other documentation shall be submitted F.O.B. destination as specified below, addressed as follows:

National Aeronautics and Space Administration  
Langley Research Center  
Attn: \_\_\_\_\_, Mail Stop \_\_\_\_\_  
Contract NAS1-  
Hampton, VA 23665-5225

B. The following letter codes designate the recipients of reports and other documentation which are required to be delivered prepaid to Langley Research Center by the Contractor:

- A--Contract Specialist, Mail Stop 126
- B--Contracting Officer Technical Representative, Mail Stop
- C--New Technology Representative, Mail Stop 200
- D--Cost Accounting, Mail Stop 135
- E--Safety Manager, Mail Stop 429
- F--Industry Relations Office, Mail Stop 105
- G--Programs and Resources Division, Mail Stop 104
- H--Patent Counsel, Mail Stop 143
- I--Industrial Property Office, Mail Stop 377
- J--According to instructions on form

C. The following are the distribution requirements for reports and other documentation required with the numeral following the letter code specifying the number of copies to be provided:

| <u>DOCUMENT</u>  | <u>LETTER CODE AND DISTRIBUTION</u> |
|--|-------------------------------------|
| Financial Management Report (NASA Forms 533M and 533Q) | A-1, B-2, D-2, F-1, G-1             |
| Award Fee Period Analysis                              | A-1, B-1                            |
| Management and Operations Plan and Revisions           | A-2, B-2                            |
| Safety and Health Plan                                 | A-1, B-1, E-1                       |

|  |                       |
|--|-----------------------|
| Quarterly Accident/Injury Report   | A-1, B-1, E-1         |
| Conformable Wage Rate Adjustment   | A-1, B-1, F-1         |
| Collective Bargaining Agreement  | A-1, B-1, F-1         |
| Report of Government-Owned/Contractor-Held Property<br>(NASA Form 1018)                | A-1, B-1, I-4         |
| Documentation for Transferring Property to the<br>Government                           | I-1                   |
| Quarterly Listing of Contractor-Acquired Property ,<br>(NASA Langley Form PROC./P-300) | A-1, I-1              |
| Subcontracting Report for Individual Contracts<br>(Standard Form 294)                  | A-1, J                |
| Summary Subcontractor Report (Standard From 295)                                       | J                     |
| Report on NASA Subcontracts  | A-1, J                |
| Annual Skill Mix and Wage Report   | A-1                   |
| Biweekly Manpower Report   | B-3                   |
| Monthly Progress Report  | A-1, B-3              |
| Quarterly Progress Report  | A-1, B-3              |
| Semiannual Equipment Report  | A-1, B-3              |
| Monthly Staffing Report  | A-1, B-1              |
| Monthly Management Report  | A-1, B-1              |
| New Technology Report  | A-1, B-1, C-1,<br>H-1 |
| Patent Rights Report   | A-1, B-1, C-1,<br>H-1 |

D. When the Contract Administrator (A) is not designated above to receive a copy of a report or document, the Contractor shall furnish a copy of the report/document transmittal letter to the Contract Administrator. The Contractor shall also furnish a copy of the transmittal letter and a copy of each Financial Management Report to the delegated Administrative Contracting Officer of the cognizant DoD (or other agency) contract administrative services component.



EXHIBIT B

REGISTER OF WAGE DETERMINATIONS

NO. 78-1030 (REV. 21) SEPTEMBER 18, 1991

U.S. DEPARTMENT OF LABOR  
 EMPLOYMENT STANDARDS ADMINISTRATION  
 WAGE AND HOUR DIVISION  
 WASHINGTON, D.C. 20210

REGISTER OF WAGE DETERMINATIONS UNDER  
 THE SERVICE CONTRACT ACT  
 By direction of the Secretary of Labor

State: Virginia  
 Area: VA COUNTIES: HAMPTON

Alan L. Moss  
 Director  
 Division of  
 Wage Determinations

Wage Determination No.: 78-1030 (Rev. 21) Date: 09/18/1991

| LOCALITY | Fringe Benefit Payments |                  |          |         |
|----------|-------------------------|------------------|----------|---------|
|          | Minimum Hourly Wage     | Health & Welfare | Vacation | Holiday |

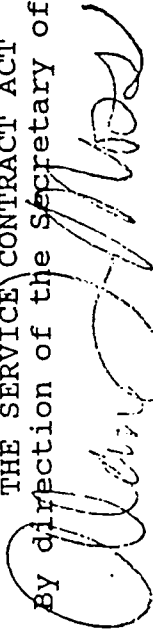
Class of Service Employees

Employed on contracts for Administrative, Clerical, and Technical services at NASA Langley Research Center in the above locality:

- |                         |       |
|-------------------------|-------|
| 1. Accounting Clerk I   | 6.31  |
| 2. Accounting Clerk II  | 7.91  |
| 3. Accounting Clerk III | 8.24  |
| 4. Accounting Clerk IV  | 9.99  |
| 5. File Clerk I         | 5.00  |
| 6. File Clerk II        | 5.54  |
| 7. File Clerk III       | 6.76  |
| 8. Inventory Clerk      | 5.23  |
| 9. Messenger            | 5.40  |
| 10. Order Clerk I       | 6.15  |
| 11. Order Clerk II      | 8.06  |
| 12. Payroll Clerk       | 7.28  |
| 13. Receptionist        | 5.91  |
| 14. Secretary I         | 7.25  |
| 15. Secretary II        | 8.38  |
| 16. Secretary III       | 8.92  |
| 17. Secretary IV        | 9.79  |
| 18. Secretary V         | 10.23 |
| 19. Stenographer I      | 7.34  |
| 20. Stenographer II     | 8.23  |

U.S. DEPARTMENT OF LABOR  
 EMPLOYMENT STANDARDS ADMINISTRATION  
 WAGE AND HOUR DIVISION  
 WASHINGTON, D.C. 20210

REGISTER OF WAGE DETERMINATIONS UNDER  
 THE SERVICE CONTRACT ACT  
 BY direction of the Secretary of Labor



Alan L. Moss  
 Director  
 Division of  
 Wage Determinations

|          |                            |
|----------|----------------------------|
| LOCALITY | State: Virginia            |
|          | Area: VA COUNTIES: HAMPTON |

Wage Determination No.: 78-1030 (Rev. 21) Date: 09/18/1991

| Minimum Hourly Wage | Fringe Benefit Payments |          |         |
|---------------------|-------------------------|----------|---------|
|                     | Health & Welfare        | Vacation | Holiday |

Class of Service Employees

|  |          |  |  |  |
|--|----------|--|--|--|
| 21. Switchboard Operator               | \$ 6.11  |  |  |  |
| 22. Switchboard Operator- Receptionist | \$ 6.41  |  |  |  |
| 23. Typist I                           | \$ 6.20  |  |  |  |
| 24. Typist II                          | \$ 7.41  |  |  |  |
| 25. Word Processor I                   | \$ 6.21  |  |  |  |
| 26. Word Processor II                  | \$ 7.70  |  |  |  |
| 27. Computer Data Librarian            | \$ 7.18  |  |  |  |
| 28. Computer Operator I                | \$ 7.45  |  |  |  |
| 29. Computer Operator II               | \$ 8.74  |  |  |  |
| 30. Computer Operator III              | \$ 10.45 |  |  |  |
| 31. Computer Operator IV               | \$ 12.01 |  |  |  |
| 32. Computer Programmer I 4/           | \$ 10.53 |  |  |  |
| 33. Computer Programmer II 4/          | \$ 13.02 |  |  |  |
| 34. Computer Programmer III 4/         | \$ 15.46 |  |  |  |
| 35. Computer Systems Analyst I 4/      | \$ 14.13 |  |  |  |
| 36. Computer Systems Analyst II 4/     | \$ 15.98 |  |  |  |
| 37. Computer Systems Analyst III 4/    | \$ 18.65 |  |  |  |
| 38. Key Entry Operator I               | \$ 6.13  |  |  |  |
| 39. Key Entry Operator II              | \$ 7.59  |  |  |  |
| 40. Peripheral Equipment Operator      | \$ 6.96  |  |  |  |
| 41. Aircraft Mechanic                  | \$ 12.61 |  |  |  |
| 42. Aircraft Worker                    | \$ 11.52 |  |  |  |
| 43. Drafter I                          | \$ 6.82  |  |  |  |

U.S. DEPARTMENT OF LABOR  
 EMPLOYMENT STANDARDS ADMINISTRATION  
 WAGE AND HOUR DIVISION  
 WASHINGTON, D.C. 20210

REGISTER OF WAGE DETERMINATIONS UNDER  
 THE SERVICE CONTRACT ACT  
 BY direction of the Secretary of Labor



Alan L. Moss Division of  
 Director Wage Determinations

Class of Service Employees

|                                     |          |
|-------------------------------------|----------|
| 44. Drafter II                      | \$ 8.50  |
| 45. Drafter III                     | \$ 10.36 |
| 46. Drafter IV                      | \$ 12.99 |
| 47. Drafter V                       | \$ 15.80 |
| 48. Technician I                    | \$ 8.00  |
| 49. Technician II                   | \$ 9.91  |
| 50. Technician III                  | \$ 11.93 |
| 51. Photo Lab Technician            | \$ 7.75  |
| 52. Emergency Medical Technician 4/ | \$ 9.71  |
| 53. Registered Industrial Nurse 4/  | \$ 13.00 |
| 54. A/C Sheetmetal Mechanic         | \$ 12.61 |

Fringe benefits applicable to all classes of service employees engaged in contract performance:

1/ 2/ 3/

|          |                            |  |  |
|----------|----------------------------|--|--|
| LOCALITY | State: Virginia            |  |  |
|          | Area: VA COUNTIES: HAMPTON |  |  |

Wage Determination No.: 78-1030 (Rev. 21) Date: 09/18/1991

| Minimum Hourly Wage | Fringe Benefit Payments |          |         |
|---------------------|-------------------------|----------|---------|
|                     | Health & Welfare        | Vacation | Holiday |

Other

- 1/ HEALTH & WELFARE: Life, accident, and health insurance plans, sick leave, pension plans, civic and personal leave, severance pay, and savings and thrift plans: Employer contributions costing an average of \$2.07 per hour computed on the basis of all hours worked by service employees employed on the contract.
- 2/ VACATION: 2 weeks paid vacation after 1 year of service with a contractor or successor; 3 weeks after 10 years of service. Length of service includes the whole span of continuous service with the present (successor) contractor, wherever employed, and with the predecessor contractors in the performance of similar work at the same Federal facility. (Reg. 4.173)
- 3/ HOLIDAYS: 10 paid holidays per year: New Year's Day, Martin Luther King Jr.'s Birthday, Washington's Birthday, Memorial Day, Independence Day, Labor Day, Columbus Day, Veterans' Day, Thanksgiving Day, and Christmas Day. (A contractor may substitute for any of the named holidays another day off with pay in accordance with a plan communicated to the employees involved.)
- 4/ The term "Service employee" does not include any employee who qualifies as an executive, administrative, or professional employee as those terms are identified in Regulations, Part 541, issued under the Fair Labor Standards Act. (See CFR, Part 541).

11  
CT  
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NOTE: The contracting officer shall require that any class of service employee which is not listed herein and which is to be employed under the contract (i.e., the work to be performed is not performed by any classification listed in the wage determination), be classified by the contractor so as to provide a reasonable relationship (i.e., appropriate level of skill comparison) between such unlisted classifications and the classifications listed in the wage determination. Such conformed classes of employees shall be paid the monetary wages and furnished the fringe benefits as are determined. Such conforming procedures shall be initiated by the contractor prior to the performance of contract work by such unlisted class(es) of employees. A written report of the proposed conforming action, including information regarding the agreement or disagreement of the authorized representative of the employees involved or, where there is no authorized representative, the employees themselves, shall be submitted by the contractor to the contracting officer no later than 30 days after such unlisted class(es) of employees performs any contract work. The contracting officer shall review the proposed action and promptly submit a report of the action, together with the agencies' recommendation and all pertinent information including the position of the contractor and the employees, to the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, for review. (See section 4.6 (b)(2) of Regulations 29 CFR 4)

UNIFORM ALLOWANCE: If employees are required to wear uniforms in the performance of this contract (either by the terms of the Government contract, by the employer, by the state or local law, etc.), the cost of furnishing such uniforms and maintaining (by laundering or dry cleaning) such uniforms is an expense that may not be borne by an employee where such cost reduces the hourly rate below that required by the wage determination. The Department of Labor will accept payment in accordance with the following standards as compliance:

The contractor or subcontractor is required to furnish all employees with an adequate number of uniforms without cost or to reimburse employees for the actual cost of the uniforms. In addition, where uniform cleaning and maintenance is made the responsibility of the employee, all contractors and subcontractors subject to this wage determination shall (in the absence of a bona fide collective bargaining agreement providing for a different amount, or the furnishing of contrary affirmative proof as to the actual cost), reimburse all employees for such cleaning and maintenance at a rate of \$3.80 a week (or 76 cents a day); and effective April 1, 1991, the note shall be \$4.25 per week (or \$85 cents per day). However, in those instances where the uniforms furnished are made of "wash and wear" materials, may be routinely washed and dried with other personal garments, and do not require any special treatment such as dry cleaning, daily washing, or commercial laundering in order to meet the cleanliness or appearance standards set by the terms of the Government contract, by the contractor, by law, or by the nature of the work, there is no requirement that employees be reimbursed for uniform maintenance costs.

NOTE: The duties of employees under job titles listed are those described in the Service Contract Act Directory of Occupations, Second Edition, July 1986, unless otherwise indicated. See also 29 CFR Part 4 Section 4.152.

\*\*\*\*\* OCCUPATIONS NOT INCLUDED IN THE SCA DIRECTORY OF OCCUPATIONS \*\*\*\*\*

PHOTO LAB TECHNICIAN

The photo lab technician must be able to process and evaluate the quality of the exposed rolls of aerial film, annotate the film with required identifying numbers and letters, make and process contact prints from aerial film, and make to scale project photoindexes of the mosaicked strips of aerial photography by use of a copy camera.

## Appendix B. Occupational Descriptions

The primary purpose of preparing job descriptions for the Bureau's wage surveys is to assist its field representatives in classifying into appropriate occupations workers who are employed under a variety of payroll titles and different work arrangements from establishment to establishment and from area to area. This permits grouping of occupational wage rates representing comparable job content. Because of this emphasis on comparability of occupational content, the Bureau's job descriptions may differ significantly from those in use in individual establishments or those prepared for other purposes. In applying these job descriptions, the Bureau's field representatives are instructed to exclude working supervisors; apprentices; and part-time, temporary, and probationary workers. Handicapped workers whose earnings are reduced because of their handicap are also excluded. Learners, beginners, and trainees, unless specifically included in the job description, are excluded.

The titles in this appendix are taken from the 1980 edition of the *Standard Occupational Classification Manual (SOC)*, issued by the U.S. Department of Commerce, Office of Federal Statistical Policy and Standards.

In general, the Bureau of Labor Statistics' occupational descriptions are much more specific than those found in the SOC manual. The BLS occupation, "Registered Industrial Nurse," for example, is limited to workers providing medical assistance and other related services (e.g., health education) to persons who are ill or become ill or suffer an injury in a factory or other establishment. The SOC occupation (code 29) includes a variety of registered nurses (e.g., school nurse, head nurse, general duty nurse, private duty nurse) that are excluded from the BLS description.

Thus, in comparing the results of this survey with other sources, factors such as differences in occupational definitions and survey scope should be taken into consideration.

### Office

#### SECRETARY

Provides principal secretarial support in an office, usually to one individual, and, in some cases, also to the subordinate staff of that individual. Maintains a close and highly responsive relationship to the day-to-day activities of the supervisor and staff. Works fairly independently, receiving a minimum of detailed supervision and guidance. Performs varied clerical and secretarial duties requiring a knowledge of office routine and an understanding of the organization, programs, and procedures related to the work of the office.

*Exclusions.* Not all positions that are titled "secretary" possess the above characteristics. Examples of positions which are excluded from the definition are as follows:

- a. Clerks or secretaries working under the direction of secretaries or administrative assistants as described in e;
- b. Stenographers not fully performing secretarial duties;
- c. Stenographers or secretaries assigned to two or more professional, technical, or managerial persons of equivalent rank.
- d. Assistants or secretaries performing any kind of technical work, e.g., personnel, accounting, or legal



- work;
- e. Administrative assistants or supervisors performing duties which are more difficult or more responsible than the secretarial work described in LR-1 through LR-4.
  - f. Secretaries receiving additional pay primarily for maintaining confidentiality of payroll records or other sensitive information;
  - g. Secretaries performing routine receptionist, typing, and filing duties following detailed instructions and guidelines; these duties are less responsible than those described in LR-1 below;
  - h. Trainees

*Classification by level.* Secretary jobs which meet the required characteristics are matched at one of five levels according to two factors: (a) Level of the secretary's supervisor within the overall organizational structure, and (b) level of the secretary's responsibility. The table following the explanations of these factors indicates the level of the secretary for each combination of factors.

*Level of Secretary's Supervisor (LS)*

Secretaries should be matched at one of the three LS levels below best describing the organization of the secretary's supervisor.

- LS-1 Organizational structure is not complex and internal procedures and administrative controls are simple and informal: supervisor directs staff through face-to-face meetings.
- LS-2 Organizational structures is complex and is divided into subordinate groups that usually differ from each other as to subject matter, function, etc.; supervisor usually directs staff through intermediate supervisors; internal procedures and administrative controls are

formal. An entire organization (e.g., division, subsidiary, or parent organization) may contain a variety of subordinate groups which meet the LS-2 definition. Therefore, it is not unusual for one LS-2 supervisor to report to another LS-2 supervisor. The presence of subordinate supervisors does not by itself mean LS-2 applies, e.g., a clerical processing organization divided into several units, each performing very similar work, is placed in LS-1. In smaller organizations or industries such as retail trades, with relatively few organizational levels, the supervisor may have an impact on the policies and major programs of the entire organization, and may deal with important outside contacts as described in LS-3.

LS-3

Organizational structure is divided into two or more subordinate supervisory levels (of which at least one is a managerial level) with several subdivisions at each level. Executive's program(s) are usually interlocked on a direct and continuing basis with other major organizational segments requiring constant attention to extensive formal coordination, clearances and procedural controls. Executive typically has: Financial decision making authority for assigned program(s); considerable impact on the entire organization's financial position or image; and responsibility for, or has staff specialists in, such areas as personnel and administration for assigned organization. Executive plays an important role in determining the policies and major programs of the entire organization, and spends considerable time dealing with outside parties actively interested in assigned program(s) and current or controversial issues.

*Level of Secretary's Responsibility (LR)*

This factor evaluates the nature of the work relationship

between the secretary and the supervisor or staff, and the extent to which the secretary is expected to exercise initiative and judgment. Secretaries should be matched at the level best describing their level of responsibility. When a position's duties span more than one LR level, the introductory paragraph at the beginning of each LR level should be used to determine which of the levels best matches the position. (Typically, secretaries performing at the higher levels of responsibility also perform duties described at the lower levels.)

LR-1 Carries out recurring office procedures independently. Selects the guideline or reference which fits the specific case. Supervisor provides specific instructions on new assignments and checks completed work for accuracy. Performs varied duties including or comparable to the following:

- a. Responds to routine telephone requests which have standard answers; refers calls and visitors to appropriate staff. Controls mail and assures timely staff response; may send form letters.
- b. As instructed, maintains supervisor's calendar, makes appointments, and arranges for meeting rooms.
- c. Reviews materials prepared for supervisor's approvals for typographical accuracy and proper format.
- d. Maintains recurring internal reports, such as time and leave records, office equipment listings, correspondence controls, training plans, etc.
- e. Requisitions supplies, printing, maintenance, or other services. Types, takes and transcribes dictation, and establishes and maintains office files.

LR-2 Handles differing situations, problems, and deviations in the work of the office according to the supervisor's general instructions, priorities, duties,

policies, and program goals. Supervisor may assist secretary with special assignments. Duties include or are comparable to the following:

- a. Screens telephone calls, visitors, and incoming correspondence; personally responds to requests for information concerning office procedures; determines which requests should be handled by the supervisor, appropriate staff member, or other offices. May prepare and sign routine, nontechnical correspondence in own or supervisor's name.
- b. Schedules tentative appointments without prior clearance. Makes arrangements for conferences and meetings and assembles established background materials, as directed. May attend meetings and record and report on the proceedings.
- c. Reviews outgoing materials and correspondence for internal consistency and conformance with supervisor's procedures; assures that proper clearances have been obtained, when needed.
- d. Collects information from the files or staff for routine inquiries on office program(s) or periodic reports. Refers nonroutine requests to supervisor or staff.
- e. Explains to subordinate staff supervisor's requirements concerning office procedures. Coordinates personnel and administrative forms for the office and forwards for processing.

LR-3

Uses greater judgment and initiative to determine the approach or action to take in nonroutine situations. Interprets and adapts guidelines, including unwritten policies, precedents, and practices, which are not always completely applicable to changing situations. Duties include or are comparable to the following:

- a. Based on a knowledge of the supervisor's views,

composes correspondence on own initiative about administrative matters and general office policies for supervisor's approval.

b. Anticipates and prepares materials needed by the supervisor for conferences, correspondence, appointments, meetings, telephone calls, etc., and informs supervisor on matters to be considered.

c. Reads publications, regulations, and directives and takes action or refers those that are important to the supervisor and staff.

d. Prepares special or one-time reports, summaries, or replies to inquiries, selecting relevant information from a variety of sources such as reports, documents, correspondence, other offices, etc., under general directions.

e. Advises secretaries in subordinate offices on new procedures, requests information needed from the subordinate offices for periodic or special conferences, reports, inquiries, etc. Shifts clerical staff to accommodate workload needs.

LR-4 Handles a wide variety of situations and conflicts involving the clerical or administrative functions of the office which often cannot be brought to the attention of the executive. The executive sets the overall objectives of the work. Secretary may participate in developing the work deadlines. Duties include or are comparable to the following:

a. Composes correspondence requiring some understanding of technical matters; may sign for executive when technical or policy content has been

authorized.

b. Notes commitments made by executive during meetings and arranges for staff implementation. Own initiative, arranges for staff member to represent organization at conferences and meetings, establishes appointment priorities, or reschedules or refuses appointments or invitations.

c. Reads outgoing correspondence for executive's approval and alerts writers to any conflict with the file or departure from policies or executive's viewpoints; gives advice to resolve the problems.

d. Summarizes the content of incoming materials, specially gathered information, or meetings to assist executive; coordinates the new information with background office sources, draws attention to important parts or conflicts.

e. In the executive's absence, ensures that requests for action or information are relayed to the appropriate staff member; as needed, interprets request and helps implement action; makes sure that information is furnished in a timely manner; decides whether executive should be notified of important or emergency matters.

Exclude secretaries performing any of the following duties: Acts as office manager for the executive's organization, e.g., determines when new procedures are needed for changing situations and devises and implements alternatives; revises or clarifies procedures to eliminate conflict or duplication; identifies and resolves various problems that affect the orderly flow of

work in transactions with parties outside the organization. Prepares agenda for conferences; explains discussion topics to participants; drafts introduction and develops background information and prepares outlines for executive or staff members to use in writing speeches. Advises individuals outside the organization on the executive's views on major policies or current issues facing the organization; contacts or responds to contacts from high-ranking outside officials (e.g., city or State officials, members of Congress, presidents of national unions or large national or international firms, etc.) in unique situations. These officials may be relatively inaccessible, and each contact typically must be handled differently, using judgment and discretion.

Excluded from this definition are:

- a. Trainee positions not requiring a fully qualified stenographer.
- b. Secretaries providing the principal secretarial support in an office and performing more responsible and discretionary tasks, as described in LR-1 through LR-4 in the secretary definition above.
- c. Stenographers who take dictation involving the frequent use of a wide variety of technical or specialized vocabulary. Typically this kind of vocabulary cannot be learned in a relatively short period of time, e.g., a month or two.
- d. Stenographers, such as shorthand reporters, who record material verbatim at hearings, conferences, or similar proceedings.

#### Criteria for Matching Secretaries by Level

| Level of Secretary's Supervisor | Level of Secretary's Responsibility |      |      |      |
|---------------------------------|-------------------------------------|------|------|------|
|                                 | LR-1                                | LR-2 | LR-3 | LR-4 |
| LS-1 .....                      | 1*                                  | 11   | III  | IV   |
| LS-2 .....                      | 1*                                  | 111  | IV   | V    |
| LS-3 .....                      | 1*                                  | IV   | V    | V    |

\* Regardless of LS Level

#### STENOGRAPHER

Primary duty is to take dictation using shorthand, and to transcribe the dictation. May also type from written copy. May operate from a stenographic pool. May occasionally transcribe from voice recordings. (If primary duty is transcribing from recordings, see Transcribing-machine typist.)

#### Stenographer I

Takes and transcribes dictation, receiving specific assignments along with detailed instructions on such requirements as form and presentation. The transcribed material is typically reviewed in rough draft, and the final transcription is reviewed for conformance with the rough draft. May maintain files, keep simple records, or perform other relatively routine clerical tasks.

#### Stenographer II

Takes and transcribes dictation determining the most appropriate format. Performs stenographic duties requiring significantly greater independence and responsibility than Stenographer I. Supervisor typically provides general instructions. Work requires a thorough working knowledge of general business and office procedures and of the specific

business operations, organizations, policies, procedures, files, workflow, etc. Uses this knowledge in performing stenographic duties and responsible clerical tasks such as maintaining follow-up files; assembling material for reports, memoranda, and letters; composing simple letters from general instructions, reading and routing incoming mail, answering routine questions, etc.

#### TRANSCRIBING MACHINE TYPIST

Primary duty is to type copy of voice recorded dictation which does not involve varied technical or specialized vocabulary such as that used in legal briefs or reports on scientific research. May also type from written copy. May maintain files, keep simple records, or perform other relatively routine clerical tasks. (See Stenographer definition for workers involved with shorthand dictation.)

#### TYPIST

Uses a manual, electric, or automatic typewriter to type various materials. Included are automatic typewriters that are used only to record text and update and reproduce previously type items from magnetic cards or tape. May include typing of stencils, mats, or similar materials for use in duplicating processes. May do clerical work involving little special training, such as keeping simple records, filing records and reports, or sorting and distributing incoming mail.

Excluded from this definition is work that involves:

- a. Typing directly from spoken material that has been recorded on disks, cylinders, belts, tapes, or other similar media.
- b. The use of varitype machines, composing equipment, or automatic equipment in preparing material for printing, and
- c. Familiarity with specialized terminology in various keyboard commands to manipulate or edit the recorded text to accomplish revisions, or to perform tasks such as

extracting and listing items from the text, or transmitting text to other terminals, or using "soft" commands to have the machine reorder material. Typically requires the use of automatic equipment which may be either computer linked or have a programmable memory so that material can be organized in regularly used formats or preformed paragraphs which can then be coded and stored for future use in letters or documents.

#### Typist I

Performs one or more of the following: Copy typing from rough or clear drafts; or routine typing of forms, insurance policies, etc.; or setting up simple standard tabulations; or copying more complex tables already set up and spaced properly.

#### Typist II

Performs one or more of the following: Typing material in final form when it involves combining material from several sources; or responsibility for correct spelling, syllabication, punctuation, etc., of technical or unusual words or foreign language material; or planning layout and typing of complicated statistical tables to maintain uniformity and balance in spacing. May type routine form letters, varying details to suit circumstances.

#### WORD PROCESSOR

Primary duty is to operate word processing equipment to enter, store, retrieve, change, and present text or tabulations. Produces a variety of printed copy such as letters, documents, or reports. May enter regularly used formats or stored paragraphs that are organized and coded for future use. Recorded texts can be changed by rearranging paragraphs, replacing words, shifting lines, etc.

(Word processing equipment typically has a full- or partial-page video display screen (CRT) and a separate printer. The equipment may be integrated with a digital computer, have

telecommunications capabilities, and also have capabilities for adding to or upgrading features. Automatic or electronic typewriters with limited text editing capabilities and often with single line electronic display "windows" are not considered word processing equipment.)

Excluded from this definition are:

- a. Workers whose primary function is to enter a data base for purposes other than composition (see key entry operator);
- b. Workers who use equipment and data base for purposes such as accounting, inventory control, sales, or original writing and editing;
- c. Workers responsible for preparation of published reports; including page layout or selection of different type sizes.

Positions are classified into levels on the basis of the following definitions:

#### Word Processor I

Performs tasks requiring a knowledge of the word processing equipment and familiarity with the formats and forms used in the establishment. Proficiency in grammar, spelling, and punctuation is also required to produce printed materials accurately. May refer problems to supervisor or higher level processor, or refer to operating manual.

#### Word Processor II

Work at this level requires considerable classroom or on-the-job training and may involve working directly with task originator rather than through supervisor. In addition to work assignments described for level I, duties include one or more of the following:

- a. Uses the more sophisticated features of the equipment to carry out complex assignments, such as sorting, merging, and organizing text, or maintaining files;

- b. Applies knowledge of specialized terminology or foreign language;
- c. Tests new applications and procedures; or
- d. Trains lower level processors.

#### FILE CLERK

Files, classifies, and retrieves material in an established filing system. May perform clerical and manual tasks required to maintain files. Positions are classified into levels on the basis of the following definitions:

#### File Clerk I

Performs routine filing of material that has already been classified or which is easily classified in a simple serial classification system (e.g., alphabetical, chronological, or numerical). As requested, locates readily available material in files and forwards material; may fill out withdrawal charge. May perform simple clerical and manual tasks required to maintain and service files.

#### File Clerk II

Sorts, codes, and files unclassified material by simple (subject matter) headings or partly classified material by finer subheadings. Prepares simple related index and cross-reference aids. As requested, locates clearly identified material in files and forwards material. May perform related clerical tasks required to maintain and service files.

#### File Clerk III

Classifies and indexes file material such as correspondence, reports, technical documents, etc., in an established filing system containing a number of varied subject matter files. May also file this material. May keep records of various types in conjunction with the files. May lead a small group of lower level file clerks.

## MESENKER

Performs various routine duties such as running errands, operating minor office machines such as sealers or mailers, opening mail, distributing mail on a regularly scheduled route or in a familiar area, and other minor clerical work. May deliver mail that requires some special handling, e.g., mail that is insured, registered, or marked for special delivery.

Excluded are positions which include any of the following as significant duties:

- a. Operating motor vehicles.
- b. Delivering valuables or security-classified mail when the work requires a continuing knowledge of special procedures for handling such items.
- c. Weighing mail, determining postage, or recording and controlling registered, insured, and certified mail in the mail room.
- d. Making deliveries to unfamiliar or widely separated buildings or points which are not part of an established route; or
- e. Directing other workers.

## RECEPTIONIST

Greets visitors, determines nature of visits, and directs visitors to appropriate persons. Receptionist duties may also include providing formation, making appointments, answering a telephone (other than switchboard or console), keeping a log of visitors, and issuing visitor passes. May also perform typing or other routine clerical duties which may occupy a major portion of time, and are usually performed at the reception desk.

This classification excludes workers operating a telephone switchboard or console, performing guard duties, or performing more difficult clerical duties.

## SWITCHBOARD OPERATOR

Operates a telephone switchboard or console used with a private branch exchange (PBX) system to relay incoming,

outgoing, and intrasystem calls. May provide information to callers, record and transmit messages, keep record of calls placed and toll charges. Besides operating a telephone switchboard or console, may also type or perform routine clerical work (typing or routine clerical work may occupy the major portion of the worker's time, and is usually performed while at the switchboard or console). Chief or lead operators in establishments employing more than one operator are excluded. For an operator who also acts as a receptionist, see Switchboard operator-receptionist.

## SWITCHBOARD OPERATOR-RECEPTIONIST

At a single position telephone switchboard or console, acts both as an operator--see Switchboard operator--and as a receptionist. Receptionist's work involves such duties as greeting visitors, determining nature of visitor's business and providing appropriate information; referring visitor to appropriate person in the organization or contacting that person by telephone and arranging an appointment; keeping a log of visitors.

## INVENTORY CLERK

A person who keep periodic or perpetual records of the amount, kind, and value of merchandise, material, or stock on hand; makes an actual physical count of the stock items; compares inventories taken by other workers with office records, or check sales, equipment, shipping, production, purchases and stock records; checks clerical computations with physical count of stock, adjusting errors in computations or count; makes up inventory reports. May operate an adding machine.

## ORDER CLERK

Receives written or verbal customer's purchase orders for material or merchandise from customers or sales people. Work typically involves some combination of the following duties: Quoting prices; determining availability of ordered items and suggesting substitutes when necessary; advising expected delivery date and method of delivery; recording order and

customer information on order sheets; checking order sheets for accuracy and adequacy of information recorded; ascertaining credit rating of customer; furnishing customer with acknowledgment of receipt of order; following up to see that order is delivered by the specified date or to let customer know of a delay in delivery; maintaining order file; checking shipping invoice against original order. Exclude workers paid on a commission basis or whose duties include any of the following: Receiving orders for services rather than for material or merchandise; providing customers with consultative advice using knowledge gained from engineering or extensive technical training; emphasizing selling skills; handling material or merchandise as an integral part of the job.

Positions are classified into levels according to the following definitions:

#### Order Clerk I

Handles orders involving items which have readily identified uses and applications. May refer to a catalog, manufacturer's manual, or similar document to insure that proper item is supplied or to verify price of ordered item.

#### Order Clerk II

Handles orders that involve making judgments such as choosing which specific product or material from the establishment's product lines will satisfy the customer's needs, or determining the price to be quoted when pricing involves more than merely referring to a price list or making some simple mathematical calculations.

#### ACCOUNTING CLERK

Performs one or more accounting tasks such as posting to registers and ledgers; balancing and reconciling accounts; verifying the internal consistency, completeness, and mathematical accuracy of accounting documents; assigning prescribed accounting distribution codes; examining and

verifying the clerical accuracy of various types of reports, lists, calculations, posting, etc.; preparing journal vouchers; or making entries or adjustments to accounts.

Levels I and II require a basic knowledge of routine clerical methods and office practices and procedures as they relate to the clerical processing and recording of transactions and accounting information. Levels III and IV require a knowledge and understanding of the established and standardized bookkeeping and accounting procedures and techniques used in an accounting system, or a segment of an accounting system, where there are few variations in the types of transactions handled. In addition, some jobs at each level may require a basic knowledge and understanding of the terminology, codes, and processes used in an automated accounting system.

#### Accounting Clerk I

Performs very simple and routine accounting clerical operations, for example, recognizing and comparing easily identified numbers and codes on similar and repetitive accounting documents, verifying mathematical accuracy, and identifying discrepancies and bringing them to the supervisor's attention. Supervisor gives clear and detailed instructions for specific assignments. Employee refers to supervisor all matters not covered by instructions. Work is closely controlled and reviewed in detail for accuracy, adequacy, and adherence to instructions.

#### Accounting Clerk II

Performs one or more routine accounting clerical operations, such as: Examining, verifying, and correcting accounting transactions to ensure completeness and accuracy of data and proper identification of accounts, and checking that expenditures will not exceed obligations in specified accounts; totaling, balancing, and reconciling collection vouchers; posting data to transaction sheets where employee identifies proper accounts and items to be posted; and coding documents in accordance with a



chart (listing) of accounts. Employee follows specific and detailed accounting procedures. Completed work is reviewed for accuracy and compliance with procedures.

#### Accounting Clerk III

Uses a knowledge of double entry bookkeeping in performing one or more of the following: Posts actions to journals, identifying subsidiary accounts affected and debit and credit entries to be made and assigning proper codes; reviews computer printouts against manually maintained journals, detecting and correcting erroneous postings, and preparing documents to adjust accounting classifications and other data; or reviews lists of transactions rejected by an automated system, determining reasons for rejections, and preparing necessary correcting material. On routine assignments, employee selects and applies established procedures and techniques. Detailed instructions are provided for difficult or unusual assignments. Completed work and methods used are reviewed for technical accuracy.

#### Accounting Clerk IV

Maintains journals or subsidiary ledgers of an accounting system and balances and reconciles accounts. Typical duties include one or both of the following: Reviews invoices and statements (verifying information, ensuring sufficient funds have been obligated, and if questionable, resolving with the submitting unit, determining accounts involved, coding transactions, and processing material through data processing and for application in the accounting system); and/or analyzes and reconciles computer printouts with operating unit reports (contacting units and research causes of discrepancies, and taking action to ensure that accounts balance). Employee resolves problems in recurring assignments in accordance with previous training and experience. Supervisor provides suggestions for handling unusual or nonrecurring transactions. Conformance with requirements and technical soundness of completed work are reviewed by the supervisor or are controlled by mechanisms

built into the accounting system.

NOTE: Excluded from level IV are positions responsible for maintaining either a general ledger or a general ledger in combination with subsidiary accounts.

#### PAYROLL CLERK

Performs the clerical tasks necessary to process payrolls and to maintain payroll records. Work involves most of the following: Processing workers' time or production records; adjusting workers' records for changes in wage rates, supplementary benefits, or tax deductions, editing payroll listings against source records; tracing and correcting errors in listings; and assisting in preparation of periodic summary payroll reports. In a nonautomated payroll system, computes wages. Work may require a practical knowledge of governmental regulations, company payroll policy, or the computer system for processing payrolls.

#### KEY ENTRY OPERATOR

Operates keyboard-controlled data entry device such as keypunch machine or key-operated magnetic tape or disk encoder to transcribe data into a form suitable for computer processing. Work requires skill in operating an alphanumeric keyboard and an understanding of transcribing procedures and relevant data entry equipment.

Positions are classified into levels on the basis of the following definitions:

##### Key Entry Operator I

Work is routine and repetitive. Under close supervision or following specific procedures or detailed instructions, works from various standardized source documents which have been coded and require little or no selecting, coding, or interpreting of data to be entered. Refers to supervisor problems arising from erroneous items, codes, or missing information.

### Key Entry Operator II

Work requires the application of experience and judgment in selecting procedures to be followed and in searching for, interpreting, selecting, or coding items to be entered from a variety of source documents. On occasion may also perform routine work as described for level I.

NOTE: Excluded are operators above level II using the key entry controls to access, read, and evaluate the substance of specific records to take substantive actions, or to make entries requiring a similar level of knowledge.

## Professional and Technical

### COMPUTER SYSTEMS ANALYST, BUSINESS

Analyzes business problems to formulate procedures for solving them by use of electronic data processing equipment. Develops a complete description of all specifications needed to enable programmers to prepare required digital computer programs. Work involves most of the following: Analyzes subject-matter operations to be automated and identifies conditions and criteria required to achieve satisfactory results; specifies number and types of records, files, and documents to be used; outlines actions to be performed by personnel and computers in sufficient detail for presentation to management and for programming (typically this involves preparation of work and data flow charts); coordinates the development of test problems and participates in trial runs of new and revised systems; and recommends equipment changes to obtain more effective overall operations. (NOTE: Workers performing both systems analysis and programming should be classified as systems analysts if this is the skill used to determine their pay.)

Does not include employees primarily responsible for the management or supervision of other electronic data processing employees, or systems analysts primarily concerned with scientific or engineering problems.

For wage study purposes, systems analysts are classified as follows:

#### Computer Systems Analyst I

Works under immediate supervision, carrying out analyses as assigned, usually of a single activity. Assignments are designed to develop and expand practical experience in the application of procedures and skills required for systems analysis work. For example, may assist a higher level systems analyst by preparing the detailed specifications required by programmers from information developed by the higher level analyst.

#### Computer Systems Analyst II

Works independently or under only general direction on problems that are relatively uncomplicated to analyze, plan, program, and operate. Problems are of limited complexity because sources of input data are homogeneous and the output data are closely related. (For example, develops systems for maintaining depositor accounts in a bank, maintaining accounts receivable in a retail establishment, or maintaining inventory accounts in a manufacturing or wholesale establishment.) Confers with persons concerned to determine the data processing problems and advises subject-matter personnel on the implications of the data processing systems to be applied. OR

Works on a segment of a complex data processing scheme or system, as described for level III. Works independently on routine assignments and receives instruction and guidance on complex assignments. Work is reviewed for accuracy of judgment, compliance with instructions, and to insure proper alignment with the overall system.

Computer Systems Analyst III

Works independently or under only general direction on complex problems involving all phases of systems analysis. Problems are complex because of diverse sources of input data and multiple-use requirements of output data. (For example, develops an integrated production scheduling, inventory control, cost analysis, and sales analysis record in which every item of each type is automatically processed through the full system of records and appropriate follow-up actions are initiated by the computer.) Confers with persons concerned to determine the data processing problems and advises subject-matter personnel on the implications of new or revised systems of data processing operations. Makes recommendations, if needed, for approval of major systems installations or changes and for obtaining equipment.

May provide functional direction to lower level systems analysts who are assigned to assist.

COMPUTER PROGRAMMER, BUSINESS

Converts statements of business problems, typically prepared by a systems analyst, into a sequence of detailed instructions which are required to solve the problems by automatic data processing equipment. Working from charts or diagrams, the programmer develops the precise instructions which, when entered into the computer system in coded language, cause the manipulation of data to achieve desired results. Work involves most of the following. Applies knowledge of computer capabilities, mathematics, logic employed by computers, and particular subject matter involved to analyze charts and diagrams of the problem to be programmed; develops sequence of program steps; writes detailed flow charts to show order in which data will be processed; converts these charts to coded instructions for machine to follow; tests and corrects programs; prepares instructions for operating personnel during production run; analyzes, reviews, and alters programs to increase operating efficiency or adapt to new requirements; maintains records of

program development and revisions. (NOTE: Workers performing both systems analysis and programming should be classified as systems analysts if this is the skill used to determine their pay.)

Does not include employees primarily responsible for the management or supervision of other electronic data processing employees, or programmers primarily concerned with scientific and/or engineering problems.

For wage study purposes, programmers are classified as follows:

Computer Programmer I

Makes practical applications of programming practices and concepts usually learned in formal training courses. Assignments are designed to develop competence in the application of standard procedures to routine problems. Receives close supervision on new aspects of assignments; and work is reviewed to verify its accuracy and conformance with required procedures.

Computer Programmer II

Works independently or under only general direction on relatively simple programs, or on simple segments of complex programs. Programs (or segments) usually process information to produce data in two or three varied sequences or formats. Reports and listings are produced by refining, adapting, arraying, or making minor additions to or deletions from input data which are readily available. While numerous records may be processed, the data have been refined in prior actions so that the accuracy and sequencing of data can be tested by using a few routine checks. Typically, the program deals with routine recordkeeping operations. OR

Works on complex programs (as described for level III) under close direction of a higher level programmer or supervisor. May assist higher level programmer by independently performing less difficult tasks assigned, and performing more difficult tasks

under fairly close direction. May guide or instruct lower level programmers.

#### Computer Programmer III

Works independently or under only general direction on complex problems which require competence in all phases of programming concepts and practices. Working from diagrams and charts which identify the nature of desired results, major processing steps to be accomplished, and the relationships between various steps of the problem solving routine; plans the full range of programming actions needed to efficiently utilize the computer system in achieving desired end products.

At this level, programming is difficult because computer equipment must be organized to produce several interrelated but diverse products from numerous and diverse data elements. A wide variety and extensive number of internal processing actions must occur. This requires such actions as development of common operations which can be reused, establishment of linkage points between operations, adjustments to data when program requirements exceed computer storage capacity, and substantial manipulation and resequencing of data elements to form a highly integrated program.

May provide functional direction to lower level programmers who are assigned to assists.

#### COMPUTER OPERATOR

In accordance with operating instructions, monitors and operates the control console of a digital computer to process data. Executes runs by either serial processing (processes one program at a time) or multiprocessing (processes two or more programs simultaneously). The following duties characterize the work of a computer operator:

- a. Studies operating instructions to determine equipment setup needed;
- b. Loads equipment with required items (tapes, cards, disks, paper, etc.)

- c. Switches necessary auxiliary equipment into system;
  - d. Starts and operates computer.
  - e. Responds to operating and computer output instructions;
  - f. Reviews error messages and makes corrections during operation or refers problems;
  - g. Maintains operating record.
- May test run new or modified programs. May assist in modifying systems or programs. The scope of this definition includes trainees working to become fully qualified computer operators, fully qualified computer operator, and lead operators providing technical assistance to lower level operators. It excludes workers who monitor and operator remote terminals.

For wage study purposes, computer operators are classified as follows:

#### Computer Operator I

Work assignments are limited to established production runs (i.e., programs which present few operating problems). Assignments may consist primarily of on-the-job training (sometimes augmented by classroom instruction). When learning to run programs, the supervisor or a higher level operator provides detailed written or oral guidance to the operator before and during the run. After the operator has gained experience with a program, however, the operator works fairly independently in applying standard operating or corrective procedures in responding to computer output instructions or error conditions, but refers problems to a higher level operator or the supervisor when standard procedures fail.

#### Computer Operator II

In addition to established production runs, work assignments include runs involving new programs, applications, and procedures (i.e., situations which require the operator to adapt to a variety of problems). At this level, the operator has the training and experience to work fairly independently in carrying out most assignments. Assignments may require the operator to select

from a variety of standard setup and operating procedures. In responding to computer output instructions or error conditions, applies standard operating or corrective procedures, but may deviate from standard procedures when standard procedures fail if deviation does not materially alter the computer unit's production plans. Refers the problem or aborts the program when procedures applied do not provide a solution. May guide lower level operators.

#### Computer Operator III

In addition to work assignments described for Computer Operator II (see above) the work of Computer Operator III involves at least one of the following:

- a. Deviates from standard procedures to avoid the loss of information or to conserve computer time even though the procedures applied materially alter the computer unit's production plans;
- b. Tests new programs, applications, and procedures;
- c. Advises programmers and subject-matter experts on setup techniques;
- d. Assists in (1) maintaining, modifying, and developing operating systems or programs; (2) developing operating instructions and techniques to cover problem situations; and/or (3) switching to emergency backup procedures (such assistance requires a working knowledge of program language, computer features, and software systems).

An operator at this level typically guides lower level operators.

#### PERIPHERAL EQUIPMENT OPERATOR

Operates peripheral equipment which directly supports digital computer operations. Such equipment is uniquely and specifically designed for computer applications, but need not be physically or electronically connected to a computer. Printers, plotters, card read/punches, tape readers, tape units or drives, disk

units or drives, and data display units are examples of such equipment.

The following duties characterize the work of a peripheral equipment operator:

- a. Loading printers and plotters with correct paper; adjusting controls for forms, thickness, tension, printing density, and location; and unloading hard copy;
- b. Labeling tape reels, disks or card decks;
- c. Checking labels and mounting and dismounting designated tape reels or disks on specified units or drives;
- d. Setting controls which regulate operation of the equipment;
- e. Observing panel lights for warnings and error indications and taking appropriate action;
- f. Examining tapes, cards, or other material for creases, tears, or other defects which could cause processing problems.

This classification excludes workers (1) who monitor and operate a control console (see Computer Operator) or a remote terminal, or (2) whose duties are limited to operating decollaters, bursters, separators, or similar equipment.

#### COMPUTER DATA LIBRARIAN

Maintains library of media (tapes, disks, cards, cassettes) used for automatic data processing applications. The following or similar duties characterize the work of a computer data librarian: Classifying, cataloging, and storing media in accordance with a standardized system; upon proper requests, releasing media for processing; maintaining records of releases and return; inspecting returned media for damage or excessive wear to determine whether or not they need replacing. May perform minor repairs to damaged tapes.

## DRAFTER

Performs drafting work requiring knowledge and skill in drafting methods, procedures, and techniques. Prepares drawings of structures, mechanical and electrical equipment, piping and duct systems and other similar equipment, systems, and assemblies. Uses recognized systems of symbols, legends, shadings, and lines having specific meanings in drawings. Drawings are used to communicate engineering ideas, designs, and information in support of engineering functions.

The following are excluded when they constitute the primary purpose of the job:

- a. Design work requiring the technical knowledge, skill, and ability to conceive or originate designs;
- b. Illustrating work requiring artistic ability;
- c. Work involving the preparation of charts, diagrams, room arrangements, floor plans, etc.;
- d. Cartographic work involving the preparation of maps or plats and related materials, and drawings of geological structures; and
- e. Supervisory work involving the management of a drafting program or the supervision of drafters.

Positions are classified into levels on the basis of the following definitions.

### Drafter I

Working under close supervision, traces or copies finished drawings, making clearly indicated revisions. Uses appropriate templates to draw curved lines. Assignments are designed to develop increasing skill in various drafting techniques. Work is spotchecked during progress and reviewed upon completion.

NOTE: Exclude drafters performing elementary tasks while receiving training in the most basic drafting methods.

### Drafter II

Prepares drawings of simple, easily visualized parts of equipment from sketches or marked-up prints. Selects

appropriate templates and other equipment needed to complete assignments. Drawings fit familiar patterns and present few technical problems. Supervisor provides detailed instructions on new assignments, gives guidance when questions arise, and reviews completed work for accuracy.

### Drafter III

Prepares various drawings of parts and assemblies, including sectional profiles, irregular or reverse curves, hidden lines, and small or intricate details. Work requires use of most of the conventional drafting techniques and a working knowledge of the terms and procedures of the industry. Familiar or recurring work is assigned in general terms; unfamiliar assignments include information on methods, procedures, sources of information, and precedents to be followed. Simple revisions to existing drawings may be assigned with a verbal explanation of the desired results; more complex revisions are produced from sketches which clearly depict the desired product.

### Drafter IV

Prepares complete sets of complex drawings which include multiple views, detail drawings, and assembly drawings. Drawings include complex design features that require considerable drafting skill to visualize and portray. Assignments regularly require the use of mathematical formulas to compute weights, load capacities, dimensions, quantities of materials, etc. Working from sketches and verbal information supplied by an engineer or designer, determines the most appropriate views, detail drawings, and supplementary information needed to complete assignments. Selects required information from precedents, manufacturers' catalogs, and technical guides. Independently resolves most of the problems encountered. Supervisor or designer may suggest methods of approach or provide advice on unusually difficult problems.

NOTE: Exclude drafters performing work of similar difficulty to that described at this level but who provide support for

a variety of organizations which have widely differing functions or requirements.

#### Drafter V

Works closely with design originators, preparing drawings of unusual, complex or original designs which require a high degree of precision. Performs unusually difficult assignments requiring considerable initiative, resourcefulness, and drafting expertise. Assures that anticipated problems in manufacture, assembly, installation, and operation are resolved by the drawings produced. Exercises independent judgment in selecting and interpreting data based on a knowledge of the design intent. Although working primarily as a drafter, may occasionally perform engineering design work in interpreting general designs prepared by others or in completing missing design details. May provide advice and guidance to lower level drafters or serve as coordinator and planner for large and complex drafting projects.

#### TECHNICIAN

This classification includes various positions described as Electronics Technician, Instrument Technician, Mechanical Technician, Instrumentation Technician, Photo Lab Maintenance Technician, and Photo Optical Technician among others. Works on various types of electronic, optical, mechanical, instrumentation, motion picture and film processing, photo optical, and calibration equipment and related devices by performing on or a combination of the following: Installing, fabricating, maintaining, repairing, overhauling, troubleshooting, modifying, constructing, testing, and operating work requires practical application of technical knowledge of related principles, ability to determine malfunctions and to resolve problems, and skills to maintain equipment in required operating condition.

Positions are classified into levels on the basis of the

following definitions.

#### Class I

Applies working technical knowledge to perform simple or routine tasks in working on various equipment following detailed instructions which cover virtually all procedures. This knowledge may be acquired through assignments designed to increase competence (including classroom training) so that worker can advance to higher level technician.

Receives technical guidance, as required from supervisor or higher level technician. Work is typically spot checked, but is given detailed review when new or advanced assignments are involved. (Assignments may include operational duties.)

#### Class II

Applies comprehensive technical knowledge to solve complex problems (i.e., those that typically can be solved solely by properly interpreting manufacturers' manuals or similar documents) in working on various equipment.

Receives technical guidance, as required, from supervisor or higher level technician and work is reviewed for specific compliance with accepted practices and work assignments. May provide technical guidance to lower level technicians. (Assignments may include operational duties.)

#### Class III

Applies advanced knowledge to solve unusually complex problems (i.e., those that typically cannot be solved solely by reference to manufacturers' manuals or similar documents) in working on various equipment.

Work may be reviewed by supervisor (frequently an engineer or designer) for general compliance with accepted practices. May provide technical guidance to lower level technicians. (Assignments may include operational duties.)

## REGISTERED INDUSTRIAL NURSE

A registered nurse gives nursing service under general medical direction to ill or injured employees or other persons who become ill or suffer an accident on the premises of a factory or other establishment. Duties involve a combination of the following: Giving first aid to the ill or injured; attending to subsequent dressing of employees' injuries; keeping records of patients treated; preparing accident reports for compensation or other purposes; assisting in physical examinations and health evaluations of applicants and employees; and planning and carrying out programs involving health education, accident prevention, evaluation of plant environment, or other activities affecting the health, welfare, and safety of all personnel. Nursing supervisors or head nurses in establishments employing more than one nurse are excluded.

## EMERGENCY MEDICAL TECHNICIAN

Administers first aid treatment to sick or injured persons and transports them to a medical facility, working as member of emergency medical team. Responds to instructions from emergency medical dispatcher and drives specially equipped emergency vehicle to specified location. Monitors communication equipment to maintain contact with dispatcher. Removes or assists in removal of victims from scene of accident or catastrophe. Determines nature and extent of illness or injury, or magnitude of catastrophe, to establish first aid procedures to be followed or need for additional assistance, basing decisions on statements of persons involved, examination of victim or victims, and knowledge of emergency medical practice. Administers prescribed first aid treatment at site of emergency, or in specially-equipped vehicle, performing such activities as application of splints, administration of oxygen or intravenous injections, treatment of minor wounds or abrasions, or administration of artificial resuscitation. Communicates with professional medical personnel at emergency treatment facility to obtain instructions regarding further treatment and to arrange

for reception of victims at treatment facility. Assists in removal of victims from vehicle and transfer of victims to treatment center. Assists treatment center admitting personnel to obtain and record information related to victim's vital statistics and circumstances of emergency. Maintains vehicles and medical and communication equipment and replenishes first aid equipment and supplies. May assist in controlling crowds, protecting valuables, or performing other duties at scene of catastrophe. May assist professional medical personnel in emergency treatment administered at medical facility.

## PHOTO LABORATORY TECHNICIAN

Applies fundamental processes, methods and techniques in the processing and printing of black and white photographs and/or slides, or transparencies. Applies specific criteria and standard procedures in contact or projection printing, processing negatives and/or producing slides and transparencies by projection, contact, or other copying processes. Operates film processing machines and equipment according to established procedures. Work does not involve any special knowledge about the subject matter; does not involve producing of special effects, dodging and burning or other involving processes; and does not include color work. Carries out routine tasks without close supervision; however, may receive assignments, assistance and review of work designed to train and develop in film processing techniques. Performs routine set up and maintenance of equipment and prepares routine reports as required. High school graduate plus technical photographic processing training and 1 year experience in photographic laboratory work.

## AIRCRAFT MECHANIC

Services, repairs, and overhauls aircraft and aircraft engines to insure airworthiness: Repairs, replaces, and assembles parts, such as wings, fuselage, tail assembly, landing gear, control cables, propeller assembly, and fuel and oil tanks, using tools, such as power shears, sheet metal breaker, arc and



acetylene welding equipment, rivet gun, and air or electric drills to rebuild or replace airframe or its components. Consults manufacturers' manuals and airline's maintenance manual for specifications and to determine feasibility of repair or replacement according to malfunction. Examines engines for cracked cylinders and oil leaks and listens to detect sounds of malfunctioning, such as sticking or burnt valves. Inspects turbine blades to detect cracks or breaks. Tests engine operation, using testing equipment, such as ignition analyzer, compression checker, distributor timer, and ammeter to locate source of malfunction. Replaces or repairs worn or damaged components, such as carburetors, superchargers, and magnetos using handtools, gauges and testing equipment. Removes engine from aircraft, using hoist or forklift truck. Disassembles and inspects parts for wear, warping, or other defects. Repairs or replaces defective engine parts and reassembles and installs engine in aircraft. Adjusts and repairs electrical wiring system and aircraft accessories and instruments. Inspects, services, and repairs pneumatic and hydraulic systems. Performs miscellaneous duties to service aircraft, including flushing crankcase, cleaning screens, greasing moving parts, and checking brakes. May be required to be licensed by Federal Aviation Administration. May service engines and airframe components at line station making repairs, short of overhaul, required to keep aircraft in safe operating condition.

#### AIRCRAFT WORKER

Makes repairs to aircraft following orders of higher grade worker. Removes, cleans, reinstalls, or replaces defective parts, accessories, and components such as worn gaskets, couplings, and fittings; bad actuators, accumulators, gauges, sections of corroded fuel and oil lines, worn cable pulleys, frayed spark plug cables, and burned-out landing lights, using handtools. Makes adjustments and settings such as cable tension and seat movement settings and adjustments. Obtains standard parts such as fuel and oil line connections and fittings, cable linkage,

and spark plug cables and harnesses by referring to parts manuals and by making comparisons with samples.

#### AIRCRAFT MECHANIC HELPER

Assists in assembling and installing parts and units by getting tools and supplies, carrying materials, and lifting and holding materials in place during operation. Cleans work areas, and keeps work benches clean and orderly, and tools and machines clean and lubricated.

EXHIBIT C

CONTRACT SECURITY CLASSIFICATION SPECIFICATION, DD FORM 254

|   |   |
|---|---|
| <p><b>DEPARTMENT OF DEFENSE</b></p> <p><b>CONTRACT SECURITY CLASSIFICATION SPECIFICATION</b></p> <p><i>(The requirements of the DoD Industrial Security Manual apply to all security aspects of this effort.)</i></p> | <p><b>1. CLASSIFICATION AND SAFEGUARDING</b></p> <p>a. FACILITY CLEARANCE REQUIRED</p> <p style="text-align: center;"><b>TOP SECRET</b></p> <p>b. LEVEL OF SAFEGUARDING REQUIRED</p> <p style="text-align: center;">N/A</p> |
|---|---|

|   |                   |   |                               |
|---|-------------------|---|-------------------------------|
| <b>2. THIS SPECIFICATION IS FOR: (X and complete as applicable)</b> |                   | <b>3. THIS SPECIFICATION IS: (X and complete as applicable)</b>           |                               |
| a. PRIME CONTRACT NUMBER  |                   | <input checked="" type="checkbox"/> ORIGINAL (Complete date in all cases) | Date (YYMMDD)<br>920107       |
| b. SUBCONTRACT NUMBER   |                   | b. REVISED (Supersedes all previous specs)                                | Revision No.<br>Date (YYMMDD) |
| c. SOLICITATION OR OTHER NUMBER                                     | Due Date (YYMMDD) | c. FINAL (Complete Item 3 in all cases)                                   | Date (YYMMDD)                 |
| <input checked="" type="checkbox"/> 1-39-1270.0267                  |                   |   |                               |

**4. IS THIS A FOLLOW-ON CONTRACT?**  YES  NO. If Yes, complete the following:  
 Classified material received or generated under \_\_\_\_\_ (Preceding Contract Number) is transferred to this follow-on contract.

**5. IS THIS A FINAL DD FORM 254?**  YES  NO. If Yes, complete the following:  
 In response to the contractor's request dated \_\_\_\_\_, retention of the identified classified material is authorized for the period of \_\_\_\_\_

**6. CONTRACTOR (Include Commercial and Government Entity (CAGE) Code)**

|                                |              |  |
|--------------------------------|--------------|--|
| a. NAME, ADDRESS, AND ZIP CODE | b. CAGE CODE | c. COGNIZANT SECURITY OFFICE (Name, Address, and Zip Code) |
| N/A                            | N/A          | N/A  |

**7. SUBCONTRACTOR**

|                                |              |  |
|--------------------------------|--------------|--|
| a. NAME, ADDRESS, AND ZIP CODE | b. CAGE CODE | c. COGNIZANT SECURITY OFFICE (Name, Address, and Zip Code) |
| N/A                            | N/A          | N/A  |

**8. ACTUAL PERFORMANCE**

|             |              |  |
|-------------|--------------|--|
| a. LOCATION | b. CAGE CODE | c. COGNIZANT SECURITY OFFICE (Name, Address, and Zip Code) |
| N/A         | N/A          | N/A  |

**9. GENERAL IDENTIFICATION OF THIS PROCUREMENT**

Instrument Support Services

| 10. THIS CONTRACT WILL REQUIRE ACCESS TO:       | YES | NO                                  | 11. IN PERFORMING THIS CONTRACT, THE CONTRACTOR WILL:  | YES                                 |
|---|-----|-------------------------------------|--|-------------------------------------|
| a. COMMUNICATIONS SECURITY (COMSEC) INFORMATION |     | <input checked="" type="checkbox"/> | a. HAVE ACCESS TO CLASSIFIED INFORMATION ONLY AT ANOTHER CONTRACTOR'S FACILITY OR A GOVERNMENT ACTIVITY                    |                                     |
| b. RESTRICTED DATA                              |     | <input checked="" type="checkbox"/> | b. RECEIVE CLASSIFIED DOCUMENTS ONLY   | <input checked="" type="checkbox"/> |
| c. CRITICAL NUCLEAR WEAPON DESIGN INFORMATION   |     | <input checked="" type="checkbox"/> | c. RECEIVE AND GENERATE CLASSIFIED MATERIAL  |                                     |
| d. FORMERLY RESTRICTED DATA                     |     | <input checked="" type="checkbox"/> | d. FABRICATE, MODIFY, OR STORE CLASSIFIED HARDWARE   |                                     |
| e. INTELLIGENCE INFORMATION:                    |     | <input checked="" type="checkbox"/> | e. PERFORM SERVICES ONLY   | <input checked="" type="checkbox"/> |
| (1) Sensitive Compartmented Information (SCI)   |     |                                     | f. HAVE ACCESS TO U.S. CLASSIFIED INFORMATION OUTSIDE THE U.S., PUERTO RICO, U.S. POSSESSIONS AND TRUST TERRITORIES        |                                     |
| (2) Non-SCI                                     |     |                                     | g. BE AUTHORIZED TO USE THE SERVICES OF DEFENSE TECHNICAL INFORMATION CENTER (DTIC) OR OTHER SECONDARY DISTRIBUTION CENTER |                                     |
| f. SPECIAL ACCESS INFORMATION                   |     | <input checked="" type="checkbox"/> | h. REQUIRE A COMSEC ACCOUNT  |                                     |
| g. NATO INFORMATION                             |     | <input checked="" type="checkbox"/> | i. HAVE TEMPEST REQUIREMENTS   |                                     |
| h. FOREIGN GOVERNMENT INFORMATION               |     | <input checked="" type="checkbox"/> | j. HAVE OPERATIONS SECURITY (OPSEC) REQUIREMENTS   |                                     |
| i. LIMITED DISSEMINATION INFORMATION            |     | <input checked="" type="checkbox"/> | k. BE AUTHORIZED TO USE THE DEFENSE COURIER SERVICE  |                                     |
| j. FOR OFFICIAL USE ONLY INFORMATION            |     | <input checked="" type="checkbox"/> | l. OTHER (Specify)   |                                     |
| k. OTHER (Specify)                              |     | <input checked="" type="checkbox"/> |  |                                     |

12. PUBLIC RELEASE. Any information (classified or unclassified) pertaining to this contract shall not be released for dissemination except as provided by the Industrial Security Manual or unless it has been approved for release by appropriate U.S. Government authority. Proposed releases shall be submitted for approval prior to release

Direct  Through (Specify):

N/A

to the Directorate for Freedom of Information and Security Review, Office of the Assistant Secretary of Defense (Public Affairs)\* for review. \* In the case of non-DoD User Agencies, requests for disclosure shall be submitted to that agency.

13. SECURITY GUIDANCE. The security classification guidance needed for this classified effort is identified below. If any difficulty is encountered in applying this guidance or if any other contributing factor indicates a need for changes in this guidance, the contractor is authorized and encouraged to provide recommended changes; to challenge the guidance or the classification assigned to any information or material furnished or generated under this contract; and to submit any questions for interpretation of this guidance to the official identified below. Pending final decision, the information involved shall be handled and protected at the highest level of classification assigned or recommended. (Fill in as appropriate for the classified effort. Attach, or forward under separate correspondence, any documents/guides/extracts referenced herein. Add additional pages as needed to provide complete guidance.)

All work will be performed at the contractor's facility, NASA, Langley Research Center, Wallops Flight Facility, and such other sites as designated by the Contracting Officer. Employees who require access to classified material or work, are required to have a SECRET security clearance. For special projects supported by the contractor at remote sites TOP SECRET clearances will be required. No classified material may be stored at the contractors facility. The Air Force Security Classification Guide for the Low Observable Programs will be used to provide basic security policy, instructions, and procedures in classifying information and material.

Actual knowledge, generation, or production of classified information is not required during the solicitation phase of this contract. This serves as written notice of the letting of a classified service contract.

14. ADDITIONAL SECURITY REQUIREMENTS. Requirements, in addition to ISM requirements, are established for this contract. (If Yes, identify the pertinent contractual clauses in the contract document itself, or provide an appropriate statement which identifies the additional requirements. Provide a copy of the requirements to the cognizant security office. Use Item 13 if additional space is needed.)  Yes  No

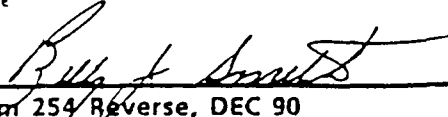
15. INSPECTIONS. Elements of this contract are outside the inspection responsibility of the cognizant security office. (If Yes, explain and identify specific areas or elements carved out and the activity responsible for inspections. Use Item 13 if additional space is needed.)  Yes  No

16. CERTIFICATION AND SIGNATURE. Security requirements stated herein are complete and adequate for safeguarding the classified information to be released or generated under this classified effort. All questions shall be referred to the official named below.

|  |   |  |
|--|---|--|
| a. TYPED NAME OF CERTIFYING OFFICIAL<br>Billy J. Smith | b. TITLE<br>Security Classification Officer | c. TELEPHONE (Include Area Code)<br>(804) 864-3415 |
|--|---|--|

d. ADDRESS (Include Zip Code)  
NASA Langley Research Center  
Hampton, VA 23665-5225

| 17. REQUIRED DISTRIBUTION           |   |
|-------------------------------------|---|
| <input checked="" type="checkbox"/> | a. CONTRACTOR   |
| <input type="checkbox"/>            | b. SUBCONTRACTOR  |
| <input checked="" type="checkbox"/> | c. COGNIZANT SECURITY OFFICE FOR PRIME AND SUBCONTRACTOR          |
| <input type="checkbox"/>            | d. U.S. ACTIVITY RESPONSIBLE FOR OVERSEAS SECURITY ADMINISTRATION |
| <input checked="" type="checkbox"/> | e. ADMINISTRATIVE CONTRACTING OFFICER                             |
| <input checked="" type="checkbox"/> | f. OTHERS AS NECESSARY  |

e. SIGNATURE  


12. PUBLIC RELEASE. Any information (classified or unclassified) pertaining to this contract shall not be released for public dissemination except as provided by the Industrial Security Manual or unless it has been approved for public release by appropriate U.S. Government authority. Proposed public releases shall be submitted for approval prior to release.

Direct  Through (Specify):

N/A

to the Directorate for Freedom of Information and Security Review, Office of the Assistant Secretary of Defense (Public Affairs)\* for review.  
 \* In the case of non-DoD User Agencies, requests for disclosure shall be submitted to that agency.

13. SECURITY GUIDANCE. The security classification guidance needed for this classified effort is identified below. If any difficulty is encountered in applying this guidance or if any other contributing factor indicates a need for changes in this guidance, the contractor is authorized and encouraged to provide recommended changes; to challenge the guidance or the classification assigned to any information or material furnished or generated under this contract; and to submit any questions for interpretation of this guidance to the official identified below. Pending final decision, the information involved shall be handled and protected at the highest level of classification assigned or recommended. (Fill in as appropriate for the classified effort. Attach, or forward under separate correspondence, any documents/guides/extracts referenced herein. Add additional pages as needed to provide complete guidance.)

All work will be performed at the contractor's facility, NASA, Langley Research Center, Wallops Flight Facility, and such other sites as designated by the Contracting Officer. Employees who require access to classified material or work, are required to have a SECRET security clearance. For special projects supported by the contractor at remote sites TOP SECRET clearances will be required. No classified material may be stored at the contractors facility. The Air Force Security Classification Guide for the Low Observable Programs will be used to provide basic security policy, instructions, and procedures in classifying information and material.

Actual knowledge, generation, or production of classified information is not required during the solicitation phase of this contract. This serves as written notice of the letting of a classified service contract.

14. ADDITIONAL SECURITY REQUIREMENTS. Requirements, in addition to ISM requirements, are established for this contract. (If Yes, identify the pertinent contractual clauses in the contract document itself, or provide an appropriate statement which identifies the additional requirements. Provide a copy of the requirements to the cognizant security office. Use item 13 if additional space is needed.)  Yes  No

15. INSPECTIONS. Elements of this contract are outside the inspection responsibility of the cognizant security office. (If Yes, explain and identify specific areas or elements carved out and the activity responsible for inspections. Use item 13 if additional space is needed.)  Yes  No

16. CERTIFICATION AND SIGNATURE. Security requirements stated herein are complete and adequate for safeguarding the classified information to be released or generated under this classified effort. All questions shall be referred to the official named below.

|  |   |  |
|--|---|--|
| a. TYPED NAME OF CERTIFYING OFFICIAL<br>Billy J. Smith | b. TITLE<br>Security Classification Officer | c. TELEPHONE (Include Area Code)<br>(804) 864-3415 |
|--|---|--|

d. ADDRESS (Include Zip Code)  
NASA Langley Research Center  
Hampton, VA 23665-5225

17. REQUIRED DISTRIBUTION

|                                     |   |
|-------------------------------------|---|
| <input checked="" type="checkbox"/> | a. CONTRACTOR   |
| <input type="checkbox"/>            | b. SUBCONTRACTOR  |
| <input checked="" type="checkbox"/> | c. COGNIZANT SECURITY OFFICE FOR PRIME AND SUBCONTRACTOR          |
| <input type="checkbox"/>            | d. U.S. ACTIVITY RESPONSIBLE FOR OVERSEAS SECURITY ADMINISTRATION |
| <input checked="" type="checkbox"/> | e. ADMINISTRATIVE CONTRACTING OFFICER                             |
| <input checked="" type="checkbox"/> | f. OTHERS AS NECESSARY  |

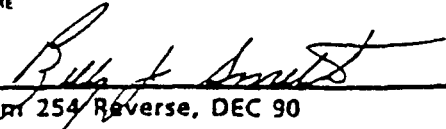
e. SIGNATURE  


EXHIBIT D

SUBCONTRACTING PLAN  
(TO BE INCORPORATED AT CONTRACT AWARD)

## PART IV - REPRESENTATIONS AND INSTRUCTIONS

SECTION K - REPRESENTATIONS, CERTIFICATIONS AND OTHER STATEMENTS OF OFFERORSK.1 CONTINGENT FEE REPRESENTATION AND AGREEMENT (FAR 52.203-4)  
(APR 1984)

(a) Representation. The offeror represents that, except for full-time bona fide employees working solely for the offeror, the offeror -

(NOTE: The offeror must check the appropriate boxes. For interpretation of the representation, including the term "bona fide employee", see Subpart 3.4 or the Federal Acquisition Regulation.)

(1) ( ) has, ( ) has not, employed or retained any person or company to solicit or obtain this contract; and

(2) ( ) has, ( ) has not, paid or agreed to pay to any person or company employed or retained to solicit or obtain this contract any commission, percentage, brokerage, or other fee contingent upon or resulting from the award of this contract.

(b) Agreement. The offeror agrees to provide information relating to the above Representation as requested by the Contracting Officer and, when subparagraph (a)(1) or (a)(2) is answered affirmatively, to promptly submit to the Contracting Officer -

(1) A completed Standard Form 119, Statement of Contingent or Other Fees, (SF 119); or

(2) A signed statement indicating that the SF 119 was previously submitted to the same contracting office, including the date and applicable solicitation or contract number, and representing that the prior SF 119 applies to this offer or quotation.

K.2 CERTIFICATION AND DISCLOSURE REGARDING PAYMENTS TO INFLUENCE  
CERTAIN FEDERAL TRANSACTIONS (FAR 52.203-11) (APR 1991)

(a) The definitions and prohibitions contained in the clause, at FAR 52.203-12, Limitation on Payments to Influence Certain Federal Transactions, included in this solicitation, are hereby incorporated by reference in paragraph (b) of this certification.

(b) The offeror, by signing its offer, hereby certifies to the best of his or her knowledge and belief, that on or after December 23, 1989, -

(1) No Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress on his or her behalf in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds (including profit or fee received under a covered Federal transaction) have been paid, or will be paid, to any person for influencing or attempting to influence an officer or employee of

any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress on his or her behalf in connection with this solicitation, the offeror shall complete and submit, with its offer, OMB standard form LLL, Disclosure of Lobbying Activities, to the Contracting Officer; and

(3) He or she will include the language of this certification in all subcontracts at any tier and require that all recipients of subcontract awards in excess of \$100,000 shall certify and disclose accordingly.

(c) Submission of this certification and disclosure is a prerequisite for making or entering into this contract imposed by section 1352, title 31, United States Code. Any person who makes an expenditure prohibited under this provision or who fails to file or amend the disclosure form to be filed or amended by this provision, shall be subject to a civil penalty of not less than \$10,000, and not more than \$100,000, for each such failure.

### K.3 TAXPAYER IDENTIFICATION (FAR 52.204-3) (SEP 1989)

#### (a) Definitions.

"Common parent," as used in this solicitation provision, means that corporate entity that owns or controls an affiliated group of corporations that files its Federal income tax returns on a consolidated basis, and of which the offeror is a member.

"Corporate status," as used in this solicitation provision, means a designation as to whether the offeror is a corporate entity, an unincorporated entity (e.g., sole proprietorship or partnership), or a corporation providing medical and health care services.

"Taxpayer Identification Number (TIN)," as used in this solicitation provision, means the number required by the IRS to be used by the offeror in reporting income tax and other returns.

(b) The offeror is required to submit the information required in paragraphs (c) through (e) of this solicitation provision in order to comply with reporting requirements of 26 U.S.C. 6041, 6041A, and 6050M and implementing regulations issued by the Internal Revenue Service (IRS). If the resulting contract is subject to the reporting requirements described in 4.902(a), the failure or refusal by the offeror to furnish the information may result in a 20 percent reduction of payments otherwise due under the contract.

(c) Taxpayer Identification Number (TIN).

TIN: \_\_\_\_\_

TIN has been applied for.

TIN is not required because:

Offeror is a nonresident alien, foreign corporation, or foreign partnership that does not have income effectively connected with the conduct of a trade or business in the U.S. and does not have an office or place of business or a fiscal paying agent in the U.S.;

Offeror is an agency or instrumentality of a foreign government;

Offeror is an agency or instrumentality of a Federal, state, or local government;

Other. State basis. \_\_\_\_\_

(d) Corporate Status.

Corporation providing medical and health care services, or engaged in the billing and collecting of payments of such services;



- Other corporate entity;
- Not a corporate entity;
- Sole proprietorship
- Partnership
- Hospital or extended care facility described in 26 CFR 501(c)(3) that is exempt from taxation under 26 CFR 501(a).
- (e) Common Parent.
  - Offeror is not owned or controlled by a common parent as defined in paragraph (a) of this clause.
  - Name and TIN of common parent:

Name \_\_\_\_\_

TIN \_\_\_\_\_

K.4 CERTIFICATION REGARDING DEBARMENT, SUSPENSION, PROPOSED DEBARMENT, AND OTHER RESPONSIBILITY MATTERS (FAR 52.209-5) (MAY 1989)

- (a)(1) The Offeror certifies, to the best of its knowledge and belief, that -
  - (i) The Offeror and/or any of its Principals -
    - (A) Are  are not  presently debarred, suspended, proposed for debarment, or declared ineligible for the award of contracts by any Federal agency;
    - (B) Have  have not , within a three-year period preceding this offer, been convicted of or had a civil judgment rendered against them for: commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, state, or local) contract or subcontract; violation of Federal or state antitrust statutes relating to the submission of offers; or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property; and
    - (C) Are  are not  presently indicted for, or otherwise criminally or civilly charged by a governmental entity with, commission of any of the offenses enumerated in subdivision (a)(1)(i)(B) of this provision.
  - (ii) The Offeror has  has not , within a three-year period preceding this offer, had one or more contracts terminated for default by any Federal agency.
- (2) "Principals," for the purposes of this certification, means officers; directors; owners; partners; and, persons having primary management or supervisory responsibilities within a business entity (e.g., general manager; plant manager; head of a subsidiary, division, or business segment, and similar positions).

THIS CERTIFICATION CONCERNS A MATTER WITHIN THE JURISDICTION OF AN AGENCY OF THE UNITED STATES AND THE MAKING OF A FALSE, FICTITIOUS, OR FRAUDULENT CERTIFICATION MAY RENDER THE MAKER SUBJECT TO PROSECUTION UNDER SECTION 1001, TITLE 18, UNITED STATES CODE.

(b) The Offeror shall provide immediate written notice to the Contracting Officer if, at any time prior to contract award, the Offeror learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

(c) A certification that any of the items in paragraph (a) of this provision exists will not necessarily result in withholding of an award under this solicitation. However, the certification will be considered in connection with a determination of the Offeror's responsibility. Failure of the Offeror to furnish a certification or provide such additional information as requested by the Contracting Officer may render the Offeror nonresponsible.

(d) Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render, in good faith, the certification required by paragraph (a) of this provision. The knowledge and information of an Offeror is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

(e) The certification in paragraph (a) of this provision is a material representation of fact upon which reliance was placed when making award. If it is later determined that the Offeror knowingly rendered an erroneous certification, in addition to other remedies available to the Government, the Contracting Officer may terminate the contract resulting from this solicitation for default.

#### K.5 TYPE OF BUSINESS ORGANIZATION (FAR 52.215-6) (JUL 1987)

The offeror or quoter, by checking the applicable box, represents that -

(a) It operates as ( ) a corporation incorporated under the laws of the State of \_\_\_\_\_, ( ) an individual, ( ) a partnership, ( ) a nonprofit organization, or ( ) a joint venture; or

(b) If the offeror or quoter is a foreign entity, it operates as ( ) an individual, ( ) a partnership, ( ) a nonprofit organization, ( ) a joint venture, or ( ) a corporation, registered for business in \_\_\_\_\_ country.

#### K.6 AUTHORIZED NEGOTIATORS (FAR 52.215-11) (APR 1984)

The offeror or quoter represents that the following persons are authorized to negotiate on its behalf with the Government in connection with this request for proposals or quotations: (list names, titles, and telephone numbers of the authorized negotiators).

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#### K.7 PERIOD FOR ACCEPTANCE OF OFFER (FAR 52.215-19) (APR 1984)

In compliance with the solicitation, the offeror agrees, if this offer is accepted within 180 calendar days (60 calendar days unless a different period is inserted by the offeror) from the date specified in the solicitation for receipt of offers, to furnish any or all items on which prices are offered at the price set opposite each item, delivered at the designated point(s), within the time specified in the Schedule.

#### K.8 SMALL BUSINESS CONCERN REPRESENTATION (FAR 52.219-1) (JAN 1991)

(a) Representation. The offeror represents and certifies as part of its offer that it ( ) is, ( ) is not a small business concern and that ( ) all, ( ) not all end items to be furnished will be manufactured or produced by a small business

concern in the United States, its territories or possessions, Puerto Rico, or the Trust Territory of the Pacific Islands.

(b) Definition. "Small business concern," as used in this provision, means a concern, including its affiliates, that is independently owned and operated, not dominant in the field of operation in which it is bidding on Government contracts, and qualified as a small business under the criteria and size standards in this solicitation.

(c) Notice. Under 15 U.S.C. 645(d), any person who misrepresents a firm's status as a small business concern in order to obtain a contract to be awarded under the preference programs established pursuant to sections 8(a), 8(d), 9, or 15 of the Small Business Act or any other provision of Federal law that specifically references section 8(d) for a definition of program eligibility, shall -

(1) be punished by imposition of fine, imprisonment, or both;

(2) be subject to administrative remedies, including suspension and debarment; and

(3) be ineligible for participation in programs conducted under the authority of the Act.

#### K.9 SMALL DISADVANTAGED BUSINESS CONCERN REPRESENTATION (FAR 52.219-2) (FEB 1990)

(a) Representation. The offeror represents that it ( ) is, ( ) is not a small disadvantaged business concern.

(b) Definitions.

"Asian-Pacific Americans," as used in this provision, means United States citizens whose origins are in Japan, China, the Philippines, Vietnam, Korea, Samoa, Guam, the U.S. Trust Territory of the Pacific Islands (Republic of Palau), the Northern Mariana Islands, Laos, Kampuchea (Cambodia), Taiwan, Burma, Thailand, Malaysia, Indonesia, Singapore, Brunei, Republic of the Marshall Islands, or the Federated States of Micronesia.

"Indian tribe," as used in this provision, means any Indian tribe, band, nation, or other organized group or community of Indians, including any Alaska Native Corporation as defined in 13 CFR 124.100 which is recognized as eligible for the special programs and services provided by the U.S. to Indians because of their status as Indians, or which is recognized as such by the State in which such tribe, band, nation, group, or community resides.

"Native Americans," as used in this provision, means American Indians, Eskimos, Aleuts, and native Hawaiians.

"Native Hawaiian Organization," as used in this provision, means any community service organization serving Native Hawaiians in, and chartered as a not-for-profit organization by, the State of Hawaii, which is controlled by Native Hawaiians, and whose business activities will principally benefit such Native Hawaiians.

"Small business concern," as used in this provision, means a concern, including its affiliates, that is independently owned and operated, not dominant in the field of operation in which it is bidding on Government contracts, and qualified as a small business under the criteria and size standards in 13 CFR 121.

"Small disadvantaged business concern," as used in this provision, means a small business concern that (a) is at least 51 percent unconditionally owned by one or more individuals who are both socially and economically disadvantaged, or a publicly owned business having at least 51 percent of its stock unconditionally owned by one or more socially and economically disadvantaged individuals and (b)

has its management and daily business controlled by one or more such individuals. This term also means a small business concern that is at least 51 percent unconditionally owned by an economically disadvantaged Indian tribe or Native Hawaiian Organization, or a publicly owned business having at least 51 percent of its stock unconditionally owned by one of these entities which has its management and daily business controlled by members of an economically disadvantaged Indian tribe or Native Hawaiian Organization, and which meets the requirements of 13 CFR 124.

"Subcontinent Asian Americans," as used in this provision, means United States citizens whose origins are in India, Pakistan, Bangladesh, Sri Lanka, Bhutan, or Nepal.

(c) Qualified groups. The offeror shall presume that socially and economically disadvantaged individuals include Black Americans, Hispanic Americans, Native Americans, Asian-Pacific Americans, Subcontinent Asian Americans, and other individuals found to be qualified by SBA under 13 CFR 124. The offeror shall also presume that socially and economically disadvantaged entities also include Indian tribes and Native Hawaiian Organizations.

K.10 WOMEN-OWNED SMALL BUSINESS REPRESENTATION (FAR 52.219-3)  
(APR 1984)

(a) Representation. The offeror represents that it ( ) is, ( ) is not, a women-owned small business concern.

(b) Definitions.

"Small business concern", as used in this provision, means a concern, including its affiliates, that is independently owned and operated, not dominant in the field of operation in which it is bidding on Government contracts, and qualified as a small business under the criteria and size standards in 13 CFR 121.

"Women-owned", as used in this provision, means a small business that is at least 51 percent owned by a woman or women who are U.S. citizens and who also control and operate the business.

K.11 PREFERENCE FOR LABOR SURPLUS AREA CONCERNS (FAR 52.220-1)  
(APR 1984)

(a) This acquisition is not a set aside for labor surplus area (LSA) concerns. However, the offeror's status as such a concern may affect (1) entitlement to award in case of tie offers or (2) offer evaluation in accordance with the Buy American Act clause of this solicitation. In order to determine whether the offeror is entitled to a preference under (1) or (2) above, the offeror must identify, below, the LSA in which the costs to be incurred on account of manufacturing or production (by the offeror or the first-tier subcontractors) amount to more than 50 percent of the contract price.

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(b) Failure to identify the locations as specified above will preclude consideration of the offeror as an LSA concern. If the offeror is awarded a contract as an LSA concern and would not have otherwise qualified for award, the offeror shall perform the contract or cause the contract to be performed in accordance with the obligations of an LSA concern.

K.12 CERTIFICATION OF NONSEGREGATED FACILITIES (FAR 52.222-21)  
(APR 1984)

(a) "Segregated facilities", as used in this provision, means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees, that are segregated by explicit directive or are in fact segregated on the basis of race, color, religion, or national origin because of habit, local custom, or otherwise.

(b) By the submission of this offer, the offeror certifies that it does not and will not maintain or provide for its employees any segregated facilities at any of its establishments, and that it does not and will not permit its employees to perform their services at any location under its control where segregated facilities are maintained. The offeror agrees that a breach of this certification is a violation of the Equal Opportunity clause in the contract.

(c) The offeror further agrees that (except where it has obtained identical certifications from proposed subcontractors for specific time periods) it will -  
(1) Obtain identical certifications from proposed subcontractors before the award of subcontracts under which the subcontractor will be subject to the Equal Opportunity clause;

(2) Retain the certifications in the files; and

(3) Forward the following notice to the proposed subcontractors (except if the proposed subcontractors have submitted identical certifications for specific time periods):

NOTICE TO PROSPECTIVE SUBCONTRACTORS OF REQUIREMENT FOR  
CERTIFICATIONS OF NONSEGREGATED FACILITIES

A Certification of Nonsegregated Facilities must be submitted before the award of a subcontract under which the subcontractor will be subject to the Equal Opportunity clause. The certification may be submitted either for each subcontract or for all subcontracts during a period (i.e., quarterly, semiannually, or annually).

NOTE: The penalty for making false statements in offers is prescribed in 18 U.S.C. 1001.

K.13 PREVIOUS CONTRACTS AND COMPLIANCE REPORTS (FAR 52.222-22)  
(APR 1984)

The offeror represents that -

(a) It ( ) has, ( ) has not, participated in a previous contract or subcontract subject either to the Equal Opportunity clause of this solicitation, the clause originally contained in Section 310 of Executive Order No. 10925, or the clause contained in Section 201 of Executive Order No. 11114;

(b) It ( ) has, ( ) has not, filed all required compliance reports; and

(c) Representations indicating submission of required compliance reports, signed by proposed subcontractors, will be obtained before subcontract awards.

## K.14 AFFIRMATIVE ACTION COMPLIANCE (FAR 52.222-25) (APR 1984)

The offeror represents that (a) it ( ) has developed and has on file, ( ) has not developed and does not have on file, at each establishment, affirmative action programs required by the rules and regulations of the Secretary of Labor (41 CFR 60-1 and 60-2), or (b) it ( ) has not previously had contracts subject to the written affirmative action programs requirement of the rules and regulations of the Secretary of Labor.

## K.15 CLEAN AIR AND WATER CERTIFICATION (FAR 52.223-1) (APR 1984)

The offeror certifies that -

- (a) Any facility to be used in the performance of this proposed contract ( ) is, ( ) is not, listed on the Environmental Protection Agency List of Violating Facilities;
- (b) The offeror will immediately notify the Contracting Officer, before award, of the receipt of any communication from the Administrator, or a designee, of the Environmental Protection Agency, indicating that any facility that the offeror proposes to use for the performance of the contract is under consideration to be listed on the EPA List of Violating Facilities; and
- (c) The offeror will include a certification substantially the same as this certification, including this paragraph (c), in every nonexempt subcontract.

K.16 CERTIFICATION REGARDING A DRUG-FREE WORKPLACE (FAR 52.223-5)  
(JUL 1990)

- (a) Definitions. As used in this provision,
  - "Controlled substance" means a controlled substance in Schedules I through V of Section 202 of the Controlled Substances Act (21 U.S.C. 812) and as further defined in regulation at 21 CFR 1308.11 - 1308.15.
  - "Conviction" means a finding of guilt (including a plea of nolo contendere) or imposition of sentence, or both, by any judicial body charged with the responsibility to determine violations of the Federal or State criminal drug statutes.
  - "Criminal drug statute" means a Federal or non-Federal criminal statute involving the manufacture, distribution, dispensing, possession or use of any controlled substance.
  - "Drug-free workplace" means the site(s) for the performance of work done by the Contractor in connection with a specific contract at which employees of the Contractor are prohibited from engaging in the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance.
  - "Employee" means an employee of a Contractor directly engaged in the performance of work under a Government contract. "Directly engaged" is defined to include all direct cost employees and any other Contractor employee who has other than minimal impact or involvement in contract performance.
  - "Individual" means an offeror/Contractor that has no more than one employee including the offeror/Contractor.
- (b) By submission of its offer, the offeror, if other than an individual, who is making an offer that equals or exceeds \$25,000, certifies and agrees that, with respect to all employees of the offeror to be employed under a contract resulting from this solicitation, it will - no later than 30 calendar days after contract award (unless a longer period is agreed to in writing), for contracts of 30

calendar days or more performance duration, or as soon as possible for contracts of less than 30 calendar days performance duration; but in any case, by a date prior to when performance is expected to be completed -

(1) Publish a statement notifying such employees that the unlawful manufacture, distribution, dispensing, possession or use of a controlled substance is prohibited in the Contractor's workplace and specifying the actions that will be taken against employees for violations of such prohibition;

(2) Establish an ongoing drug-free awareness program to inform such employees about -

(i) The dangers of drug abuse in the workplace;

(ii) The Contractor's policy of maintaining a drug-free workplace;

(iii) Any available drug counseling, rehabilitation, and employee assistance programs; and

(iv) The penalties that may be imposed upon employees for drug abuse violations occurring in the workplace;

(3) Provide all employees engaged in performance of the contract with a copy of the statement required by subparagraph (b)(1) of this provision;

(4) Notify such employees in writing in the statement required by subparagraph (b)(1) of this provision that, as a condition of continued employment on the contract resulting from this solicitation, the employee will -

(i) Abide by the terms of the statement; and

(ii) Notify the employer in writing of the employee's conviction under a criminal drug statute for a violation occurring in the workplace no later than 5 calendar days after such conviction;

(5) Notify the Contracting Officer in writing within 10 calendar days after receiving notice under subdivision (b)(4)(ii) of this provision, from an employee or otherwise receiving actual notice of such conviction. The notice shall include the position title of the employee; and

(6) Within 30 calendar days after receiving notice under subdivision (b)(4)(ii) of this provision of a conviction, take one of the following actions with respect to any employee who is convicted of a drug abuse violation occurring in the workplace:

(i) Take appropriate personnel action against such employee, up to and including termination; or

(ii) Require such employee to satisfactorily participate in a drug abuse assistance or rehabilitation program approved for such purposes by a Federal, State, or local health, law enforcement, or other appropriate agency.

(7) Make a good faith effort to maintain a drug-free workplace through implementation of subparagraphs (b)(1) through (b)(6) of this provision.

(c) By submission of its offer, the offeror, if an individual who is making an offer of any dollar value, certifies and agrees that the offeror will not engage in the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance in the performance of the contract resulting from this solicitation.

(d) Failure of the offeror to provide the certification required by paragraphs (b) or (c) of this provision, renders the offeror unqualified and ineligible for award. (See FAR 9.104-1(g) and 19.602-1(a)(2)(i).)

(e) In addition to other remedies available to the Government, the certification in paragraphs (b) or (c) of this provision concerns a matter within the jurisdiction of an agency of the United States and the making of a false, fictitious, or fraudulent certification may render the maker subject to prosecution under Title 18, United States Code, Section 1001.

K.17 NOTICE OF RESTRICTIONS ON CONTRACTING WITH SANCTIONED PERSONS  
(FAR 52.225-12) (APR 1991)

(a) Statutory prohibitions have been imposed on contracting with sanctioned persons, as specified in Federal Acquisition Regulation (FAR) 25.10 and in the clause at 52.225-13, Restrictions on Contracting with Sanctioned Persons.

(b) By submission of this offer, the Offeror represents that no products or services delivered to the Government under any contract resulting from this solicitation will be products or services of a sanctioned person, as defined in the clause referenced in paragraph (a) of this provision, unless one of the exceptions in subparagraphs (d)(1) or (d)(2) of the clause referenced above applies or unless listed below.

| <u>Products or Service</u> | <u>Sanctioned Person</u> |
|----------------------------|--------------------------|
| _____                      | _____                    |
| _____                      | _____                    |
| _____                      | _____                    |

(List as necessary)

K.18 COST ACCOUNTING STANDARDS NOTICES AND CERTIFICATION  
(NATIONAL DEFENSE) (FAR 52.230-1) (SEP 1987)

NOTE: This notice does not apply to small businesses or foreign governments. This notice is in four parts, identified by Roman numerals I. through IV. Offerors shall examine each part and provide the requested information in order to determine Cost Accounting Standards (CAS) requirements applicable to any resultant contract.

I. DISCLOSURE STATEMENT - COST ACCOUNTING PRACTICES AND CERTIFICATION

(a) Any contract in excess of \$100,000 resulting from this solicitation, except contracts in which the price negotiated is based on (1) established catalog or market prices of commercial items sold in substantial quantities to the general public, or (2) prices set by law or regulation, will be subject to the requirements of Federal Acquisition Regulation (FAR) Subparts 30.3 and 30.4, except for those contracts which are exempt as specified in FAR 30.201-1.

(b) Any offeror submitting a proposal which, if accepted, will result in a contract subject to the requirements of FAR Subparts 30.3 and 30.4 must, as a condition of contracting, submit a Disclosure Statement as required by FAR 30.202. The Disclosure Statement must be submitted as a part of the offeror's proposal under this solicitation unless the offeror has already submitted a Disclosure Statement disclosing the practice used in connection with the pricing of this proposal. If an applicable Disclosure Statement has already been submitted, the offeror may satisfy the requirement for submission by providing the information requested in paragraph (c) of Part I of this provision.

CAUTION: A practice disclosed in a Disclosure Statement shall not, by virtue of such disclosure, be deemed to be a proper, approved, or agreed-to practice for pricing proposals or accumulating and reporting contract performance cost data.



(c) Check the appropriate box below:

(1) Certificate of Concurrent Submission of Disclosure Statement.

The offeror hereby certifies that, as a part of the offer, copies of the Disclosure Statement have been submitted as follows: (i) original and one copy to the cognizant Administrative Contracting Officer (ACO), and (ii) one copy to the cognizant contract auditor.

(Disclosure must be on Form Number CASB-DS-1. Forms may be obtained from the cognizant ACO.)

Date of Disclosure Statement \_\_\_\_\_

Name and Address of Cognizant ACO where filed \_\_\_\_\_

The offeror further certifies that practices used in estimating costs in pricing this proposal are consistent with the cost accounting practices disclosed in the Disclosure Statement.

(2) Certificate of Previously Submitted Disclosure Statement.

The offeror hereby certifies that Disclosure Statement was filed as follows:

Date of Disclosure Statement \_\_\_\_\_

Name and Address of Cognizant ACO where filed \_\_\_\_\_

The offeror further certifies that the practices used in estimating costs in pricing this proposal are consistent with the cost accounting practices disclosed in the applicable disclosure statement.

(3) Certificate of Monetary Exemption.

The offeror hereby certifies that the offeror, together with all divisions, subsidiaries, and affiliates under common control, did not receive net awards of negotiated national defense prime contracts and subcontracts subject to CAS totaling more than \$10 million in the cost accounting period immediately preceding the period in which this proposal was submitted. The offeror further certifies that if such status changes before an award resulting from this proposal, the offeror will advise the Contracting Officer immediately.

(4) Certificate of Interim Exemption.

The offeror hereby certifies that (i) the offeror first exceeded the monetary exemption for disclosure, as defined in (3) above, in the cost accounting period immediately preceding the period in which this offer was submitted and (ii) in accordance with FAR 30.202-1, the offeror is not yet required to submit a Disclosure Statement. The offeror further certifies that if an award resulting from this proposal has not been made within 90 days after the end of that period, the offeror will immediately submit a revised certificate to the Contracting Officer, in the form specified under subparagraphs (c)(1) or (c)(2) of Part I of this provision, as appropriate, to verify submission of a completed Disclosure Statement.

**CAUTION:** Offerors currently required to disclose because they were awarded a CAS-covered national defense prime contract or subcontract of \$10 million or more in the current cost accounting period may not claim this exemption (4). Further, the exemption applies only in connection with proposals submitted before expiration of the 90-day period following the cost accounting period in which the monetary exemption was exceeded.

II. COST ACCOUNTING STANDARDS - EXEMPTION FOR CONTRACTS OF \$500,000 OR LESS

If this proposal is expected to result in the award of a contract of \$500,000 or less, the offeror shall indicate whether the exemption below is claimed. Failure to check the box below shall mean that the resultant contract is subject to CAS requirements or that the offeror elects to comply with such requirements.

( ) The offeror hereby claims an exemption from the CAS requirements under the provisions of Federal Acquisition Regulation (FAR) 30.201-1(b)(7) and certifies that notification of final acceptance of all deliverable items has been received on all prime contracts or subcontracts containing the Cost Accounting Standards clause or the Disclosure and Consistency of Cost Accounting Practices clause. The offeror further certifies that the Contracting Officer will be immediately notified in writing when an award of any other contract or subcontract containing Cost Accounting Standards clauses is received by the offeror subsequent to this certificate but before the date of any award resulting from this proposal.

III. COST ACCOUNTING STANDARDS - ELIGIBILITY FOR MODIFIED CONTRACT COVERAGE

If the offeror is eligible to use the modified provisions of Federal Acquisition Regulation (FAR) 30.201-2(b) and elects to do so, the offeror shall indicate by checking the box below. Checking the box below shall mean that the resultant contract is subject to the Disclosure and Consistency of Cost Accounting Practices clause in lieu of the Cost Accounting Standards clause.

( ) The offeror hereby claims an exemption from the Cost Accounting Standards clause under the provisions of FAR 30.201-2(b) and certifies that the offeror is eligible for use of the Disclosure and Consistency of Cost Accounting Practices clause because (i) during the cost accounting period immediately preceding the period in which this proposal was submitted, the offeror received less than \$10 million in awards of CAS-covered national defense prime contracts and subcontracts, and (ii) the sum of such awards equaled less than 10 percent of total sales during that cost accounting period. The offeror further certifies that if such status changes before an award resulting from this proposal, the offeror will advise the Contracting Officer immediately.

CAUTION: An offeror may not claim the above eligibility for modified contract coverage if this proposal is expected to result in the award of a national defense contract of \$10 million or more or if, during its current cost accounting period, the offeror has been awarded a single CAS-covered national defense prime contract or subcontract of \$10 million or more.

IV. ADDITIONAL COST ACCOUNTING STANDARDS APPLICABLE TO EXISTING CONTRACTS

The offeror shall indicate below whether award of the contemplated contract would, in accordance with subparagraph (a)(3) of the Cost Accounting Standards clause, require a change in established cost accounting practices affecting existing contracts and subcontracts.

( ) YES

( ) NO

NOTE: If the offeror has checked "yes" above and is awarded the contemplated contract, the offeror will be required to comply with the requirements of subparagraph (a)(1) and paragraphs (b) and (c) of the Administration of Cost Accounting Standards clause.

K.19 CONTRACTS BETWEEN NASA AND FORMER NASA EMPLOYEES  
(NASA 18-52.203-70) (DEC 1988) (NASA/FAR SUPPLEMENT)

The offeror represents that he or she ( ) is, or ( ) is not, an individual who was employed by NASA during the past two (2) years, or a firm in which such an individual is a partner, principal officer, or majority shareholder or that is otherwise controlled or predominantly staffed by such individuals.

K.20 USE OF GOVERNMENT-OWNED PROPERTY (NASA 18-52.245-79) (MAR 1989)  
(NASA/FAR SUPPLEMENT)

(a) The offeror does ( ) does not ( ) intend to use in performance of any contract awarded as a result of this solicitation existing Government-owned facilities (real property or plant equipment), special test equipment, or special tooling (including any property offered by this solicitation). The offeror shall identify any offered property not intended to be used. If the offeror does intend to use any of the above items, the offeror must furnish the following information required by Federal Acquisition Regulation (FAR) 45.205(b), NASA FAR Supplement (NFS) 18-45.102-70, and NFS 18-45.104(b):

(1) Identification and quantity of each item. Include the item's acquisition cost if it is not property offered by this solicitation.

(2) For property not offered by this solicitation, identification of the Government contract under which the property is accountable and written permission for its use from the cognizant Contracting Officer.

(3) Amount of rent calculated in accordance with FAR 45.403 and the clause at FAR 52.245-9, Use and Charges, unless the property has been offered on a rent-free basis by this solicitation.

(4) The dates during which the property will be available for use, and if used in more than one contract, the amounts of respective uses in sufficient detail to support proration of the rent. This information is not required for property offered by this solicitation.

(b) The offeror does ( ) does not ( ) request additional Government provided property for use in performing any contract awarded as a result of this solicitation. If the offeror requests additional Government-provided property, the offeror must furnish -

(1) Identification of the property, quantity, and estimated acquisition cost of each item; and

(2) The offeror's written statement as prescribed by FAR 45.302-1(a)(4).

(c) If the offeror intends to use any Government property (paragraphs (a) or (b) above), the offer must also furnish the following:

(1) The date of the last Government review of the offeror's property control and accounting system, actions taken to correct any deficiencies found, and the name and telephone number of the cognizant property administrator.

(2) A statement that the offeror has reviewed, understands, and can comply with all property management and accounting procedures in the solicitation, FAR Subpart 45.5, and NFS Subparts 18-45.5, 18-45.70, and 18-45.71.

(3) A statement indicating whether or not the costs associated with subparagraph (2) above, including plant clearance and/or plant reconversion costs, are included in its cost proposal.

K.21 PAYMENT INFORMATION (LaRC 52.232-98) (JUN 1988)

The following is the address to which payment must be sent, if payment is made by check.

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SECTION L - INSTRUCTIONS, CONDITIONS, AND NOTICES TO OFFERORS

L.1 ORGANIZATIONAL CONFLICTS OF INTEREST CERTIFICATE--MARKETING CONSULTANTS (FAR 52.209-7) (NOV 1991)

(a) Definitions.

(1) "Marketing consultant" means any independent contractor who furnishes advice, information, direction, or assistance to an offeror or any other contractor in support of the preparation or submission of an offer for a Government contract by that offeror. An independent contractor is not a marketing consultant when rendering --

- (i) Services excluded in Subpart 37.2;
- (ii) Routine engineering and technical services (such as installation, operation, or maintenance of systems, equipment, software, components, or facilities);
- (iii) Routine legal, actuarial, auditing, and accounting services; or
- (iv) Training services.

(2) Organizational conflict of interest means that because of other activities or relationships with other persons, a person is unable or potentially unable to render impartial assistance or advice to the Government, or the person's objectivity in performing the contract work is or might be otherwise impaired, or a person has an unfair competitive advantage.

(b) An individual or firm that employs, retains, or engages contractually one or more marketing consultants in connection with a contract, shall submit to the contracting officer, with respect to each marketing consultant, the certificates described below, if the individual or firm is notified that it is the apparent successful offeror.

(c) The certificate must contain the following:

- (1) The name of the agency and the number of the solicitation in question.
- (2) The name, address, telephone number, and federal taxpayer identification number of the marketing consultant.
- (3) The name, address, and telephone number of a responsible officer or employee of the marketing consultant who has personal knowledge of the marketing consultants involvement in the contract.
- (4) A description of the nature of the services rendered by or to be rendered by the marketing consultant.
- (5) The name, address, and telephone number of the client or clients, and the name of a responsible officer or employee of the marketing consultant who is knowledgeable about the services provided to such client(s), and a description of the nature of the services rendered to such client(s), if, based on information provided to the Contractor by the marketing consultant, any marketing consultant

is rendering or, in the 12 months preceding the date of the certificate, has rendered services respecting the same subject matter of the instant solicitation, or directly relating to such subject matter, to the Government or any other client (including any foreign Government or person).

(6) A statement that the person who signs the certificate for the prime Contractor has informed the marketing consultant of the existence of Subpart 9.5 and Office of Federal Procurement Policy Letter 89-1.

(7) The signature, name, title, employer's name, address, and telephone number of the persons who signed the certificates for both the apparent successful offeror and the marketing consultant.

(d) In addition, the apparent successful offeror shall forward to the Contracting Officer a certificate signed by the marketing consultant that the marketing consultant has been told of the existence of Subpart 9.5 and Office of Federal Procurement Policy Letter 89-1, and the marketing consultant has made inquiry, and to the best of the consultant's knowledge and belief, the consultant has provided no unfair competitive advantage to the prime Contractor with respect to the services rendered or to be rendered in connection with the solicitation, or that any unfair competitive advantage that, to the best of the consultant's knowledge and belief, does or may exist, has been disclosed to the offeror.

(e) Failure of the offeror to provide the certifications may result in the offeror being determined ineligible for award. Misrepresentation of any fact may result in the assessment of penalties associated with false certifications or such other provisions provided for by law or regulation.

L.2 NOTICE OF PRIORITY RATING FOR NATIONAL DEFENSE USE (FAR 52.212-7)  
(MAY 1986)

Any contract awarded as a result of this solicitation will be a ( ) DX rated order; ( X ) DO rated order certified for national defense use under the Defense Priorities and Allocations System (DPAS) (15 CFR 350), and the Contractor will be required to follow all of the requirements of this regulation.

L.3 SOLICITATION DEFINITIONS (FAR 52.215-5) (JUL 1987)

"Offer" means "proposal" in negotiation.

"Solicitation" means a request for proposals (RFP) or a request for quotations (RFQ) in negotiation.

"Government" means United States Government.

L.4 UNNECESSARILY ELABORATE PROPOSALS OR QUOTATIONS (FAR 52.215-7)  
(APR 1984)

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

L.5 AMENDMENTS TO SOLICITATIONS (FAR 52.215-8) (DEC 1989)

(a) If this solicitation is amended, then all terms and conditions which are not modified remain unchanged.

(b) Offerors shall acknowledge receipt of any amendment to this solicitation (1) by signing and returning the amendment; (2) by identifying the amendment number and date in the space provided for this purpose on the form for submitting an offer; (3) by letter or telegram or (4) facsimile, if facsimile offers are authorized in the solicitation. The Government must receive the acknowledgment by the time specified for receipt of offers.

#### L.6 SUBMISSION OF OFFERS (FAR 52.215-9) (DEC 1989)

(a) Offers and modifications thereof shall be submitted in sealed envelopes or packages (1) addressed to the office specified in the solicitation, and (2) showing the time specified for receipt, the solicitation number, and the name and address of the offeror.

(b) Telegraphic offers will not be considered unless authorized by the solicitation; however, offers may be modified by written or telegraphic notice.

(c) Facsimile offers, modifications or withdrawals will not be considered unless authorized by the solicitation.

(d) Item samples, if required, must be submitted within the time specified for receipt of offers. Unless otherwise specified in the solicitation, these samples shall be (1) submitted at no expense to the Government and (2) returned at the sender's request and expense, unless they are destroyed during preaward testing.

#### L.7 LATE SUBMISSIONS, MODIFICATIONS, AND WITHDRAWALS OF PROPOSALS (FAR 52.215-10) (DEC 1989)

(a) Any proposal received at the office designated in the solicitation after the exact time specified for receipt will not be considered unless it is received before award is made and it -

(1) Was sent by registered or certified mail not later than the fifth calendar day before the date specified for receipt of offers (e.g., an offer submitted in response to a solicitation requiring receipt of offers by the 20th of the month must have been postmarked by the 15th);

(2) Was sent by mail or, if authorized by the solicitation, was sent by telegram or via facsimile and it is determined by the Government that the late receipt was due solely to mishandling by the Government after receipt at the Government installation;

(3) Was sent by U.S. Postal Service Express Mail Next Day Service-Post Office to Addressee, not later than 5:00 p.m. at the place of mailing two working days prior to the date specified for receipt of proposals. The term "working days" excludes weekends and U.S. Federal holidays; or

(4) Is the only proposal received.

(b) Any modification of a proposal or quotation, except a modification resulting from the Contracting Officer's request for "best and final" offer, is subject to the same conditions as in subparagraphs (a)(1), (2), and (3) of this provision.

(c) A modification resulting from the Contracting Officer's request for "best and final" offer received after the time and date specified in the request will not be considered unless received before award and the late receipt is due solely to mishandling by the Government after receipt at the Government installation.

(d) The only acceptable evidence to establish the date of mailing of a late proposal or modification sent either by registered or certified mail is the U.S. or Canadian Postal Service postmark on the envelope or wrapper and on the original receipt from the U.S. or Canadian Postal Service. Both postmarks must show a

legible date or the proposal, quotation, or modification shall be processed as if mailed late. "Postmark" means a printed, stamped, or otherwise placed impression (exclusive of a postage meter machine impression) that is readily identifiable without further action as having been supplied and affixed by employees of the U.S. or Canadian Postal Service on the date of mailing. Therefore, offerors or quoters should request the postal clerks to place a legible hand cancellation bull's-eye postmark on both the receipt and the envelope or wrapper.

(e) The only acceptable evidence to establish the time of receipt at the Government installation is the time/date stamp of that installation on the proposal wrapper or other documentary evidence of receipt maintained by the installation.

(f) The only acceptable evidence to establish the date of mailing of a late offer, modification, or withdrawal sent by Express Mail Next Day Service-Post Office to Addressee is the date entered by the post office receiving clerk on the "Express Mail Next Day Service-Post Office to Addressee" label and the postmark on both the envelope or wrapper and on the original receipt from the U.S. Postal Service. "Postmark" has the same meaning as defined in paragraph (d) of this provision, excluding postmarks of the Canadian Postal Service. Therefore, offerors or quoters should request the postal clerk to place a legible hand cancellation bull's-eye postmark on both the receipt and the envelope or wrapper.

(g) Notwithstanding paragraph (a) of this provision, a late modification of an otherwise successful proposal that makes its terms more favorable to the Government will be considered at any time it is received and may be accepted.

(h) Proposals may be withdrawn by written notice or telegram (including mailgram) received at any time before award. If the solicitation authorizes facsimile proposals, proposals may be withdrawn via facsimile received at any time before award, subject to the conditions specified in the provision entitled "Facsimile Proposals." Proposals may be withdrawn in person by an offeror or an authorized representative, if the representative's identity is made known and the representative signs a receipt for the proposal before award.

#### L.8 PREPARATION OF OFFERS (FAR 52.215-13) (APR 1984)

(a) Offerors are expected to examine the drawings, specifications, Schedule, and all instructions. Failure to do so will be at the offeror's risk.

(b) Each offeror shall furnish the information required by the solicitation. The offeror shall sign the offer and print or type its name on the Schedule and each continuation sheet on which it makes an entry. Erasures or other changes must be initialed by the person signing the offer. Offers signed by an agent shall be accompanied by evidence of that agent's authority, unless that evidence has been previously furnished to the issuing office.

(c) For each item offered, offerors shall (1) show the unit price/cost, including, unless otherwise specified, packaging, packing, and preservation and (2) enter the extended price/cost for the quantity of each item offered in the "Amount" column of the Schedule. In case of discrepancy between a unit price/cost and an extended price/cost, the unit price/cost will be presumed to be correct, subject, however, to correction to the same extent and in the same manner as any other mistake.

(d) Offers for supplies or services other than those specified will not be considered unless authorized by the solicitation.

(e) Offerors must state a definite time for delivery of supplies or for performance of services, unless otherwise specified in the solicitation.

(f) Time, if stated as a number of days, will include Saturdays, Sundays, and holidays.

L.9 EXPLANATION TO PROSPECTIVE OFFERORS (FAR 52.215-14) (APR 1984)

Any prospective offeror desiring an explanation or interpretation of the solicitation, drawings, specifications, etc., must request it in writing soon enough to allow a reply to reach all prospective offerors before the submission of their offers. Oral explanations or instructions given before the award of the contract will not be binding. Any information given to a prospective offeror concerning a solicitation will be furnished promptly to all other prospective offerors as an amendment of the solicitation, if that information is necessary in submitting offers or if the lack of it would be prejudicial to any other prospective offerors.

L.10 FAILURE TO SUBMIT OFFER (FAR 52.215-15) (APR 1984)

Recipients of this solicitation not responding with an offer should not return this solicitation, unless it specifies otherwise. Instead, they should advise the issuing office by letter or postcard whether they want to receive future solicitations for similar requirements. If a recipient does not submit an offer and does not notify the issuing office that future solicitations are desired, the recipient's name may be removed from the applicable mailing list.

L.11 CONTRACT AWARD (FAR 52.215-16) (JUL 1990)--ALTERNATE II (AUG 1991)

(a) The Government will award a contract resulting from this solicitation to the responsible offeror whose offer conforming to the solicitation will be most advantageous to the Government, cost or price and other factors, specified elsewhere in this solicitation, considered.

(b) The Government may (1) reject any or all offers if such action is in the public interest, (2) accept other than the lowest offer, and (3) waive informalities and minor irregularities in offers received.

(c) The Government intends to evaluate proposals and award a contract after written or oral discussions with all responsible offerors who submit proposals within the competitive range.

(d) The Government may accept any item or group of items of an offer, unless the offeror qualifies the offer by specific limitations. *Unless otherwise provided in the Schedule, offers may be submitted for quantities less than those specified. The Government reserves the right to make an award on any item for a quantity less than the quantity offered, at the unit cost or prices offered, unless the offeror specifies otherwise in the offer.*

(e) A written award or acceptance of offer mailed or otherwise furnished to the successful offeror within the time for acceptance specified in the offer shall result in a binding contract without further action by either party. Before the offer's specified expiration time, the Government may accept an offer (or part of an offer, as provided in paragraph (d) above), whether or not there are negotiations after its receipt, unless a written notice of withdrawal is received before award. Negotiations conducted after receipt of an offer do not constitute a rejection or counteroffer by the Government.

(f) Neither financial data submitted with an offer, nor representations concerning facilities or financing, will form a part of the resulting contract.



However, if the resulting contract contains a clause providing for price reduction for defective cost or pricing data, the contract price will be subject to reduction if cost or pricing data furnished is incomplete, inaccurate, or not current.

(g) The Government may determine that an offer is unacceptable if the prices proposed are materially unbalanced between line items or subline items. An offer is materially unbalanced when it is based on prices significantly less than cost for some work and prices which are significantly overstated in relation to cost for other work, and if there is a reasonable doubt that the offer will result in the lowest overall cost to the Government, even though it may be the low evaluated offer, or it is so unbalanced as to be tantamount to allowing an advance payment.

#### L.12 FACILITIES CAPITAL COST OF MONEY (FAR 52.215-30) (SEP 1987)

(a) Facilities capital cost of money will be an allowable cost under the contemplated contract, if the criteria for allowability in subparagraph 31.205-10 (a)(2) of the Federal Acquisition Regulation are met. One of the allowability criteria requires the prospective Contractor to propose facilities capital cost of money in its offer.

(b) If the prospective Contractor does not propose this cost, the resulting contract will include the clause Waiver of Facilities Capital Cost of Money.

#### L.13 TYPE OF CONTRACT (FAR 52.216-1) (APR 1984)

The Government contemplates award of a cost-plus-award-fee contract resulting from this solicitation.

#### L.14 SIC CODE AND SMALL BUSINESS SIZE STANDARD (FAR 52.219-22) (JAN 1991)

(a) The standard industrial classification (SIC) code for this acquisition is 8734.

(b)(1) The small business size standard is \$3,500,000 in annual average receipts in the three (3) previous fiscal years.

(2) The small business size standard for a concern which submits an offer in its own name, other than on a construction or service contract, but which proposes to furnish a product which it did not itself manufacture, is 500 employees.

#### L.15 PREAWARD ON-SITE EQUAL OPPORTUNITY COMPLIANCE REVIEW (FAR 52.222-24) (APR 1984)

An award in the amount of \$1 million or more will not be made under this solicitation unless the offeror and each of its known first-tier subcontractors (to whom it intends to award a subcontract of \$1 million or more) are found, on the basis of a compliance review, to be able to comply with the provisions of the Equal Opportunity clause of this solicitation.

#### L.16 NOTICE OF COMPENSATION FOR PROFESSIONAL EMPLOYEES (FAR 52.222-45) (APR 1984)

Note the provisions relating to evaluation of compensation for professional employees set forth elsewhere in this solicitation. Failure to comply with these

provisions may constitute sufficient cause to justify rejection of a proposal. The total compensation plan required to be submitted by the offeror will be viewed as being within the purview of Public Law 87-653 (10 U.S.C. 2306(f)) and in accordance with Federal Acquisition Regulation 15.802(a).

L.17 EVALUATION OF COMPENSATION FOR PROFESSIONAL EMPLOYEES  
(FAR 52.222-46) (APR 1984)

(a) Recompensation of service contracts may in some cases result in lowering the compensation (salaries and fringe benefits) paid or furnished professional employees. This lowering can be detrimental in obtaining the quality of professional services needed for adequate contract performance. It is therefore in the Government's best interest that professional employees, as defined in 29 CFR 541, be properly and fairly compensated. As a part of their proposals, offerors will submit a total compensation plan setting forth salaries and fringe benefits proposed for the professional employees who will work under the contract. The Government will evaluate the plan to assure that it reflects a sound management approach and understanding of the contract requirements. This evaluation will include an assessment of the offeror's ability to provide uninterrupted high-quality work. The professional compensation proposed will be considered in terms of its impact upon recruiting and retention, its realism, and its consistency with a total plan for compensation. Supporting information will include data, such as recognized national and regional compensation surveys and studies of professional, public and private organizations, used in establishing the total compensation structure.

(b) The compensation levels proposed should reflect a clear understanding of work to be performed and should indicate the capability of the proposed compensation structure to obtain and keep suitably qualified personnel to meet mission objectives. The salary rates or ranges must take into account differences in skills, the complexity of various disciplines, and professional job difficulty. Additionally, proposals envisioning compensation levels lower than those of predecessor Contractors for the same work will be evaluated on the basis of maintaining program continuity, uninterrupted high-quality work, and availability of required competent professional service employees. Offerors are cautioned that lowered compensation for essentially the same professional work may indicate lack of sound management judgment and lack of understanding of the requirement.

(c) The Government is concerned with the quality and stability of the work force to be employed on this contract. Professional compensation that is unrealistic low or not in reasonable relationship to the various job categories, since it may impair the Contractor's ability to attract and retain competent professional service employees, may be viewed as evidence of failure to comprehend the complexity of the contract requirements.

L.18 SERVICE OF PROTEST (FAR 52.233-2) (NOV 1988)

(a) Protests, as defined in Section 33.101 of the Federal Acquisition Regulation, that are filed directly with an agency, and copies of any protests that are filed with the General Accounting Office (GAO) or the General Services Administration Board of Contract Appeals (GSBCA), shall be served on the Contracting Officer (addressed as follows) by obtaining written and dated acknowledgment of receipt from William R. Kivett, NASA, Langley Research Center, Mail Stop 134, Hampton, VA 23665-5225.

(b) The copy of any protest shall be received in the office designated above on the same day a protest is filed with the GSBCA or within one day of filing a protest with the GAO.

L.19 INCREASES IN ESTIMATED COSTS (NASA 18-52.215-70) (DEC 1988)

Once the apparent successful offeror has been selected, that offeror may not unilaterally increase the estimated costs submitted with its proposal except for -

- (a) Changes resulting from updating or correcting the certified cost or pricing data submitted with its proposal;
- (b) Costs resulting from the Government's directed correction of identified weaknesses in the proposal that must be corrected as a condition of contracting; or

(c) Minor changes in the requirements of the solicitation. In such cases, the Government will consider only those increases arising from requirements actually affected by the changes (irrespective of whether the changes result in an increase or decrease in the requirements or are initiated by the Government or the offeror) and then only to the extent the increases are identified and justified.

L.20 RESTRICTION ON USE AND DISCLOSURE OF PROPOSAL/QUOTATION INFORMATION (DATA) (NASA 18-52.215-72) (DEC 1984)

It is NASA policy to use information contained in proposals and quotations for evaluation purposes only. While this policy does not require that the proposal or quotation bear a restrictive notice, offerors and quoter should, in order to maximize protection of trade secrets or other information that is commercial or financial and confidential or privileged, place the following notice on the title page of the proposal or quotation and specify the information subject to the notice by inserting appropriate identification, such as page numbers, in the notice. In any event, information (data) contained in proposals and quotations will be protected to the extent permitted by law, but NASA assumes no liability for use and disclosure of information not made subject to the notice.

RESTRICTION ON USE AND DISCLOSURE OF PROPOSAL AND QUOTATION INFORMATION (DATA)

The information (data) contained in (insert page numbers or other identification) of this proposal or quotation constitutes a trade secret and/or information that is commercial or financial and confidential or privileged. It is furnished to the Government in confidence with the understanding that it will not, without permission of the offeror, be used or disclosed for other than evaluation purposes; provided, however, that in the event a contract is awarded on this proposal or quotation the Government shall have the right to use and disclose this information (data) to the extent provided in the contract. This restriction does not limit the Government's right to use or disclose this information (data) if obtained from another source without restriction.

L.21 EXPENSES RELATED TO OFFEROR SUBMISSIONS (NASA 18-52.215-75)  
(DEC 1988)

This solicitation neither commits the Government to pay any cost incurred in the submission of the offer or in making necessary studies or designs for preparing the offer, nor to contract for services or supplies. Any costs incurred in anticipation of a contract shall be at the offeror's own risk.

L.22 FALSE STATEMENTS (NASA 18-52.215-76) (DEC 1988)

PROPOSALS MUST SET FORTH FULL, ACCURATE, AND COMPLETE INFORMATION AS REQUIRED BY THE SOLICITATION (INCLUDING ATTACHMENTS). THE PENALTY FOR MAKING FALSE STATEMENTS IN PROPOSALS IS PRESCRIBED IN 18 U.S.C. 1001.

L.23 DISPOSAL OF UNSUCCESSFUL PROPOSALS (NASA 18-52.215-80)  
(DEC 1988)

After contract award, one or more copies of each unsuccessful proposal will be retained in the Government's official contract file, and all other copies will be destroyed.

L.24 SMALL BUSINESS AND SMALL DISADVANTAGED BUSINESS SUBCONTRACTING PLAN  
(NASA 18-52.219-73) (DEC 1988) ALTERNATE I (DEC 1988)

- (a) This provision is not applicable to small business concerns.
- (b) The contract expected to result from this solicitation will contain FAR clause 52.219-9, "Small Business and Small Disadvantaged Business Subcontracting Plan." Each offeror must submit the complete plan with its initial proposal.

L.25 PREPROPOSAL/PRE-BID CONFERENCE (NASA 18-52.215-77) (DEC 1988)

- (a) A preproposal/pre-bid conference will be held as indicated below:

Date: May 18, 1992

Time: 1:00 p.m. - 5:00 p.m.

Location: This Center at 17 W. Taylor Street (Bldg. 1212), Room 200

Other information: The conference is expected to last approximately four (4) hours.

For planning your itinerary, the following is a tentative agenda for the conference:

Agenda

Registration 12:30 p.m. - 1:00 p.m.

Opening Remarks 1:00 p.m. - 1:15 p.m.

LaRC Presentations 1:15 p.m. - 2:15 p.m.

Break 2:15 p.m. - 2:30 p.m.

Questions and Answers 2:30 p.m. - 3:00 p.m.

Facility Tour (Includes tour of incumbent's facility to view GFE) 4:00 p.m. - 5:00 p.m.

Attendance will be limited to a maximum of three (3) representatives per offeror. The briefing will be unclassified. If you desire to attend the conference, you should so indicate by written or telephone contact with the appropriate individual listed in L.26 no later than May 14, 1992. After the briefing, advise this Center if you intend to submit a proposal.

In order that as many questions as possible may be answered at the NASA presentations during the briefing, written questions must be submitted to the contact listed in L.26 no later than May 11, 1992. A limited time may be available for answering questions submitted on the day of the conference. However, as there is no assurance that adequate time to answer such questions will remain, submission of questions prior to the conference, by the date specified above, will assure their being fully answered.

(b) Attendance at the preproposal/pre-bid conference is recommended; however, attendance is neither required nor a prerequisite for proposal/bid submission and will not be considered in the evaluation.

L.26 COMMUNICATIONS REGARDING THIS SOLICITATION (LaRC 52.204-95)  
(JUN 1988)

Any communications in reference to this solicitation shall cite the solicitation number and be directed to the following Government representative:

Name: R. Todd Lacks  
Phone: (804) 864-2477 (COLLECT CALLS NOT ACCEPTED)  
Easy Link: 709356  
Facsimile: 804-864-7709  
Address: National Aeronautics and Space Administration  
Langley Research Center  
Attn: R. Todd Lacks, Mail Stop 126  
Hampton, VA 23665-5225

Any written communications must include the mail code on the envelope or on the telex.

L.27 BIDDERS LIBRARY

A bidders library has been established and is located at 4 Langley Boulevard (Bldg. 1230), Room 202 at NASA LaRC. Information regarding the library and its contents is included in Attachment 9 - Bidder's Library Information. The library contains NASA Handbooks (NHB's), Langley Handbooks (LHB's), Langley Management Instructions (LMI's), and other standards and guidelines referenced in the RFP. The hours of operation are from 8:30 a.m. to 4:00 p.m. Monday through Friday, excluding holidays. The library will be open for operation from release of the RFP through the proposal due date. Offerors wishing to visit the bidders library should contract Ms. Nita Langford at (804) 864-4759 to schedule an appointment. All users of the bidders library must have a proper NASA Visitor's Badge, which may be obtained from the NASA Langley Badge and Pass Office located at the Main Gate (1 Langley Boulevard). Limited copying support will be provided for materials in the bidders library. The maximum total number of pages (single side,

L.28 NASA'S POLICY ON FACILITIES CAPITAL COST OF MONEY (LaRC 52.215-95)  
(JUN 1988)

As required by NASA FAR Supplement 18-15.970-3, when facilities capital cost of money is included as an item of cost in the Contractor's proposal, a reduction in the profit objective shall be made in an amount equal to the amount of facilities capital cost of money allowed in accordance with FAR 31.205-10(a).

L.29 REQUIREMENT FOR SPECIAL TECHNICAL CAPABILITIES (LaRC 52.215-96)  
(JUN 1988)

It is NASA policy to obtain maximum practicable competition consistent with the nature of each procurement. However, to prevent unnecessary expense associated with preparation and submission of a proposal, only firms with demonstrated experience and background in the Statement of Work task areas are encouraged to respond to this request.

L.30 CERTIFICATION OF COST OR PRICING DATA (LaRC 52.215-97)  
(JUN 1988)

Pursuant to the provisions of Public Law 87-653, as amended by Public Law 97-86, the Contractor will be required to certify, except where the price negotiated is based on adequate price competition, as determined by the Contracting Officer, or established catalog or market prices of commercial items sold in substantial quantities to the general public, or prices set by law or regulation, that the cost or pricing data submitted or identified on Standard Form 1411 are accurate, complete, and current. The required certificate is set forth in FAR 15.804-4, a copy of which is attached (NASA-Langley Form PROC./P-281) and which shall be properly executed after negotiation and prior to contract award.

L.31 REJECTION, NEGOTIATION, AWARD AND EXPENDITURE OF FUNDS  
(LaRC 52.215-99) (JUN 1988)

This solicitation does not commit the Government to award a contract, since 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 the Government to the expenditure of public funds in connection with the proposed procurement.

L.32 GOVERNMENT/CONTRACTOR INTERFACE

To assist you in preparing your organizational structure, the proposed interface methods to be utilized by the Government in the monitoring of the services required by Task 2.5 and 2.6 and the assignment of work orders under the proposed contract are shown below:

A. The Contracting Officer will delegate authority to the Contracting Officer's Technical Representative (COTR) to issue work orders and monitor work under the Statement of Work (SOW) task areas. Government Technical Monitors will provide interface between the COTR and the Contractor, monitor the work progress on individual work orders, and provide input to the COTR on work order performance.

B. The Government contract administrator/management team will consist of the Contracting Officer; the COTR; Government Technical Monitors; and the Contract Specialist, who is the Government's principle contract administration contact.

C. In addition to providing oversight for the on-going services required by Tasks 2.5 and 2.6, the Government will provide by written work order, applicable information such as: description of work; any specifications, drawings, etc.; a completion date; and any other instructions deemed appropriate. The Contractor shall furnish a control and reporting system capable of accurately obtaining in a timely manner actual man-hours and materials costs associated with each work order.

### L.33 GEOGRAPHICAL LIMITATION

The successful offeror will be required to have a facility that is located within a maximum of a 30-minute over-the-road driving distance from LaRC to qualify for consideration under this procurement. A facility within close proximity to NASA/LaRC is necessary due to the need for the following:

(1) approximately twenty-five percent (25%) of the effort is on-call maintenance for which urgent and immediate response is required to permit research to proceed and minimize costly delays, (2) instrument and transducer verifications frequently need to be on-line as do personal computer repairs and other areas of the effort, and (3) daily Government/Contractor interfaces are necessary to accommodate changing LaRC needs and requirements. This geographical limitation will not restrict the successful offeror from awarding subcontracts to firms outside this range, nor will it preclude the Contractor from performing portions of the instrument support services at other divisions of the company.

### L.34 ROYALTY INFORMATION (FAR 52.227-6) (APR 1984)

(a) Cost or charges for royalties. When the response to this solicitation contains costs or charges for royalties totaling more than \$250, the following information shall be included in the response relating to each separate item of royalty or license fee:

- (1) Name and address of licensor.
- (2) Date of license agreement.
- (3) Patent numbers, patent application serial numbers, or other basis on which the royalty is payable.
- (4) Brief description, including any part or model numbers of each contract item or component on which the royalty is payable.
- (5) Percentage or dollar rate of royalty per unit.
- (6) Unit price of contract item.
- (7) Number of units.
- (8) Total dollar amount of royalties.

(b) Copies of current licenses. In addition, if specifically requested by the Contracting Officer before execution of the contract, the offeror shall furnish a copy of the current license agreement and an identification of applicable claims of specific patents.

### L.35 ESTIMATED INSTRUMENT SUPPORT SERVICES REQUIREMENT

Based upon previous experience, expected facility programs, and the current instrument inventory, the Contractor shall on a yearly basis be required to

- (1) receive and inspect 4,000-6,000 instruments (or instrument components);

(2) calibrate 12,000-15,000 instruments or sensors; (3) repair 4,000-6,000 instruments (while providing on-site maintenance to others); (4) provide instrument and data systems engineering and technician support on over 800 different projects; (5) provide maintenance for approximately 6,000 computer systems (with approximately 20,000 peripherals) that include 100 microcomputer-based data acquisition systems, 4,600 personal computer systems, various graphics workstations, minicomputers, and small data acquisition systems; and (6) provide data systems hardware/software design and documentation services for an estimated 25 major facilities using about 50 minicomputers. NOTE: Contractor should be prepared to handle 50 service calls or more per day that require on-site service. Approximately 25 percent of the Contractor effort will be for services requiring immediate attention during the Government's first shift.

#### L.36 CONTRACTOR'S OFF-SITE FACILITY

The Contractor shall provide an off-site facility to house all personnel, Contractor-furnished equipment, appropriate Government-furnished equipment (listed in Attachment 4), Government-furnished materials, and documentation. The facility must meet the minimum requirements set forth in Attachment 13.

#### L.37 TRANSPORTATION

The Contractor shall furnish all transportation necessary to perform the required services described in the Statement of Work, except for Government-furnished transportation of large pieces of equipment requiring large flat bed trucks and cranes for proper handling.

#### L.38 PROPOSAL PREPARATION AND SUBMISSION - SPECIAL INSTRUCTIONS

A. Number of Proposals, Time and Place of Submission--The offeror shall submit the original and fifteen (15) copies of each volume of his proposal to the address shown in Block 8. of the Standard Form (SF) 33 (face page of this solicitation), or if hand carried, to the depository listed in Block 9. of the SF 33. Offers must be received at the place indicated on or before the date and hour shown in Block 9. of the SF 33. Each volume of the original must be designated as such, and each volume of all other copies shall be numbered, 1 through 15, on the outside cover.

B. Proposal Clarity--Your proposal should be specific, complete, and concise. The offeror is urged to examine this solicitation in its entirety and to assure that his proposal contains all the necessary information, provides all required documentation and is complete in all respects since evaluation of the proposal will be based on the actual material presented and not on the basis of what is implied. You should ensure that your cost proposal is consistent with your technical proposal in all respects since the cost proposal may be used as an aid to determine the offeror's understanding of the technical requirements. Discrepancies may be viewed as a lack of understanding.

#### C. Proposal Format and Content

1. Proposals must be submitted in two (2) volumes: Volume I, Technical/Management (Mission Suitability) Proposal, and Volume II, Business



Proposal. No cost information shall be presented in the Technical/Management Proposal, except the salary data for Key Personnel, and the data required by the Professional Compensation Plan (see L.17 on Page 100, Subfactor 2 on Page 108 and Subfactor 5 on Page 111 of this RFP).

2. Based upon previous experience with procurements of this size and complexity, the items to be addressed in the Technical/Management Proposal can be adequately covered in one hundred (100) pages. The Government, therefore, recommends that the offeror limit the Technical/Management proposal to one hundred (100) pages, exclusive of resumes, cover page, table of contents, and dividers. All text should be printed black on white paper. Each "page" is one side of one sheet, 8 1/2" x 11", with at least one inch margins on all sides. Foldouts count as an equivalent number of 8 1/2" x 11" pages. Type should be no smaller than 12 points; text should be double spaced (at least 12 points of leading between lines) and a pitch of no more than 12 characters per inch. Type size, spacing, and margin requirements should also apply to foldouts. All pages of each volume should be numbered sequentially.

3. Each volume should be specific and complete. Each volume shall include the detailed information outlined below in order that it can be evaluated in accordance with the evaluation factors set forth in Section M, M.2. You shall structure each volume to adhere to the subfactor headings listed below:

#### D. TECHNICAL/MANAGEMENT PROPOSAL - VOLUME I

1. The prime Contractor will be responsible for satisfactory accomplishment of the contract awarded hereunder. In the event other organizations are proposed as being involved in the conduct of this work, their relationship during the effort shall be indicated, and their proposed contributions to the work and to your proposal shall be identified and integrated into each part of the proposal as applicable.

2. Risk Analysis - In accordance with NFS 1870.3, Appendix I, Section 301, Paragraph 1.f. - Proposal risk will be carefully considered in evaluating proposals. The proposal risks to be assessed are those associated with cost, schedule, and performance or technical aspects of the program. These risks will be considered in the Mission Suitability subfactors and the cost factor evaluation. As part of your proposal, you should submit a risk analysis which identified risk areas associated with each Mission Suitability subfactor, as appropriate. You should also submit your recommended approaches to minimize the impact of those risks on the overall success of the program.

#### 3. FACTOR 1 - MISSION SUITABILITY

a. Subfactor 1 - Phase-In Plan, Staffing, Continuing Personnel Management and Non-Professional Compensation - Your response to this subfactor should address your plans for minimizing changeover difficulties, maximizing continuity of services, and maintaining competent staffing for the term of the contract. Accordingly, your proposal should include the following:

(1) A detailed description and schedule of all phase-in activities. Your description should include your plans for reaching a full

complement of qualified personnel by contract start (October 1, 1992); a table of personnel sources noting the percentage of the total initial work force which you intend to obtain from the following: offeror's own resources, other divisions of the offeror's company, subcontractor or team agreements, outside recruitment, and incumbent personnel retention. Provide your rationale for the proposed mix of personnel sources. You should discuss your plans for making operational any non-personnel resources required for contract performance; e.g., facility, materials, equipment, and vehicles (If necessary, relocation of Government-furnished equipment and materials from the incumbent's facility to the successful offeror's facility will be the responsibility of the Government). NOTE: For purposes of establishing your phase-in milestones, assume Contractor selection by September 1, 1992, contract award by September 15, 1992, and contract start date of October 1, 1992.

(2) You should include the staffing skill mix you propose. Indicate the number of individuals of each level you propose to employ for each of the positions described in Attachment 1, as well as any other positions you deem appropriate. The estimated staffing in Attachment 1 is provided for the offerors' information only and is not restrictive for proposal purposes. You should propose the staff that is optimum for contract performance and meets the level of effort specified, and provide rationale therefor.

(3) A description of the recruitment and employment methods your company will use to staff the contract during the contract term (initial period and all optional periods).

(4) A discussion of your plans for accommodating personnel absences, and fluctuating workloads. Also, include your company's programs and policies for minimizing turnover and retaining experienced personnel.

(5) A description of your training, orientation, and career development plans with regard to new hires, on-board employees, and changing requirements.

(6) A description of your approach to determining non-professional employees compensation levels including a detailed discussion of fringe benefits and leave policies. Itemize the benefits that require employee contributions and the amount of that contribution as a percentage of the total cost of the benefit and of the employee's wage. Describe your policies for establishing the wage levels of any retained incumbent contractor employees and explain the eligibility and vesting for hired incumbent contractor employees for your proposed fringe benefits; e.g., vacation, medical insurance, sick leave, and retirement. Describe how pre-existing medical conditions for incumbents and their dependents will be handled under your health insurance plan. Highlight differences, if any, between the compensation policies for professional and non-professional personnel.

b. Subfactor 2 - Professional Compensation Plan - Include a Professional Compensation Plan for the professional employees proposed under the contract to include salaries and a detailed description of fringe benefits and leave policies. Itemize the benefits that require employee contributions and the amount of that contribution as a percentage of the total cost of the benefit and

of the employee's salary. Describe your policy for establishing the salaries of any retained incumbent contractor employees and explain the eligibility and vesting for hired incumbent contractor employees for your proposed fringe benefits; e.g., vacation, medical insurance, sick leave, and retirement. Describe how pre-existing medical conditions for incumbents and their dependents will be handled under your health insurance plan. Your Professional Compensation Plan should be submitted in accordance with FAR 52.222-46 (see L.17 of this RFP). You should include your compensation plans for all professional positions as defined in 29 CFR 541.

c. Subfactor 3 - Operations Plan - This subfactor will be used to evaluate your understanding of the Statement of Work requirements and your approach for meeting these requirements. Accordingly, your proposal should address each of the following:

(1) Management and technical approach to accomplish the work described in the Statement of Work, Section C. Be specific in discussing your initial review of work orders, procedures for personnel assignments, and technical assessment of work in progress. Explain how you will support urgent maintenance and calibration requests, on-line instrument and transducer verifications, personal computer and work station maintenance and repair, calibration system and computer system software configuration control and maintenance, and daily Government/Contractor interfaces to accommodate changing LaRC needs.

Consistent with the approach and procedures described above, describe your approach for complete technical performance by responding to the specific evaluation criteria requested at the bottom on each of the ten (10) Representative Work Order Problems included as Attachment 3 to this RFP. At a minimum, a complete response to all identified criteria is required even though your approach to complete the task may be accomplished in your facility, subcontracted, or other alternative. Response to each specific Work Order problem should be in narrative form and may include charts, schedules, block diagrams, and other formats necessary to demonstrate your understanding of the requirement and to describe your approach to management and implementation, as appropriate.

(2) Specific evaluation criteria for the ten (10) Representative Work Order Problems, as applicable, are as follows:

(A) Assumptions that you make regarding details that in practice would be determined through consultations with the Government Technical Monitor.

(B) Technical approach and potential problems.

1. Test measurement procedures.
2. Data analysis procedures.
3. Quality assurance for monitoring and tracking performance.
4. Logistical procedures.
5. Schedules and milestones.
6. Planning, preparation, and implementation.

7. Equipment set-up and post-test close out procedures at test site.
8. Documentation.
9. Site preparation.
10. Block diagram of system.
11. Interfaces with government personnel.
12. Potential problems.

(C) Proposed staffing.

1. Project management structure and/or equivalent.
2. Skill level.

(D) Estimates of and rationale for equipment and other non-personnel resources.

1. Selection of calibration standards and precision measurement test equipment from Government Furnished Equipment List and/or other sources.

2. Contingency procedure for failed equipment.

(2) Work Order Control System - Describe your work order control system including your approach to work order identification; tracking, monitoring, and reporting work order status; implementing changes; preventing unauthorized changes; discrepancy resolution; establishing priorities and responding to changing priorities; and interfacing with the COTR and Government Technical Monitors. Describe your approach for controlling work order costs, insuring the Government receives acceptable products on schedule within the manhours/costs allotted.

(3) Quality and Reliability Program - Describe your quality and reliability program including your plans for insuring that industry/Government standards (ref. Paragraph 1.2.2 of the Statement of Work) are maintained; and that inspections, tests, soldering, configuration control of software and hardware, and documentation standards meet the established guidelines as defined in the Statement of Work. Describe your quality control procedures including your plans for insuring that Center metrology programs are fully implemented; errors are minimized; and errors which are made are discovered, corrected, and proper action is taken to preclude their recurrence.

(4) Inventory Control System - Describe your inventory control system including your approach to insuring availability of parts, schematics, and documentation required to repair, calibrate, and maintain all brands of equipment covered in this contract. Also, describe your approach to identifying, tracking, and safeguarding the items contained in your inventory.

(5) Subcontracting or Teaming Agreements, Policies, and Procedures - Identify any work functions which the offeror expects to obtain through subcontracting or teaming. Such features as the rationale for the arrangement, the qualifications of the subcontractor or team members, magnitude of the effort, commitment of parties providing such goods and/or services, and

control and integration of the subcontract or team effort with the prime effort should be addressed. Describe your subcontracting policies and procedures including a discussion of your approach to specification development, solicitation preparation, evaluation criteria, selection, award, and subcontract management.

(6) Purchasing Policies and Procedures - Describe your purchasing system policies and procedures including your approach to insuring efficient and effective expenditure of Government funds. Specify who has procurement authority within your company and indicate their dollar level of authority. Indicate whether your company has an approved purchasing system and provide the name of the approving agency and date of the approval.

d. Subfactor 4 - Organization - Include an organization chart and supporting narrative for the organization proposed to perform the contract. If subcontractor or teaming arrangements are proposed, show their placements and reporting relationships within your organization. Your narrative should describe lines of authority within the contract organization, proposed interfaces with the Government, other elements of your company, and subcontractor(s) and/or team member(s), and the duties, responsibilities, and authorities vested in your management/supervisory team. Describe, through the use of position descriptions, hiring vacancy announcements, or sample resumes, the qualifications of the first-line supervisors/group leaders you consider essential in the successful performance of the contract effort. Describe any corporate resources or support which will be available under the contract.

e. Subfactor 5 - Key Personnel - This subfactor will be used to evaluate the education, experience, and other qualifications of your proposed Key Personnel against their proposed functions/duties and the position qualifications set forth in Attachment 2, Key Personnel Requirements.

(1) Positions which the Government considers to be "Key" to this effort are so designated in Attachment 2 to this RFP. You should list any other positions which you consider to be "Key," as well as the rationale for so designating each Key position. You should identify the specific persons proposed for each of these positions and shall include a resume for each such individual. Each resume should detail the individual's education, experience, and other qualifications for the proposed position. These resumes should be clear, complete, and comprehensive. Please do not use acronyms in these resumes as it sometimes hampers the Government's evaluation.

(2) Your proposal should include the basis for your selection of each individual for his/her position. Also state current and proposed salary for each individual and provide signed statements from the individual evidencing your ability to employ each individual at the proposed salary and fringe benefits. The capability and knowledge demonstrated by proposed Key Personnel at oral discussions, if held, as well as the findings of any reference checks which are made, may be considered in arriving at final scores.

(3) Your proposal should include references for all proposed Key Personnel relative to their current and previous positions. These references should be people directly knowledgeable of your proposed Key Personnel's training,

experience and performance. You should include names, organizations and current telephone numbers for these references.

E. BUSINESS PROPOSAL - VOLUME II

1. FACTOR 2 - COST

a. Offerors are required to submit cost proposals using Standard Form (SF) 1411, Contract Pricing Proposal Cover Sheet, a copy of which is included as Attachment 7 of the solicitation. Offerors shall fully comply with the requirements of Table 15-2, Instructions for Submission of a Contract Pricing Proposal, which begins on page 2 of the SF 1411. Provide supporting information for each cost element as required by Table 15-2. Offerors shall also provide Cost Forms as specified below (examples shown in Attachment 5), on diskette as well as in their written proposals, to aid the source evaluation board in comparing the proposed costs. SF 1411's and cost forms shall be provided as follows:

|   | Forms           | Period            |
|---|-----------------|-------------------|
| Phase-In                                  | SF 1411         | Prior to 10/1/92  |
| Initial Contract Period                   | SF 1411, A1, B1 | 10/1/92 - 9/30/93 |
| First Option to Extend                    | SF 1411, A2, B2 | 10/1/93 - 9/30/94 |
| Second Option to Extend                   | SF 1411, A3, B3 | 10/1/94 - 9/30/95 |
| First Year, Third Option to Extend        | A4, B4          | 10/1/95 - 9/30/96 |
| Second Year, Third Option to Extend       | A5, B5          | 10/1/96 - 9/30/97 |
| Total Third Option (Two Years)            | SF 1411, A6, B6 | 10/1/95 - 9/30/97 |
| Total, Initial Contract and Options 1 - 3 | SF 1411, A7, B7 | 10/1/92 - 9/30/97 |
| Options to Extend 4 - 9 (One Mo. Each)    | SF 1411, A8, B8 | 10/1/97 - 3/31/98 |
| Total, Ph.-In, Init. Contr. and Opts. 1-9 | SF 1411, A9, B9 | 10/1/92 - 3/31/98 |
| Options to Increase Level of Effort       | SF 1411, C      | 10/1/92 - 3/31/98 |
| Options to Increase ODC Limit.            | SF 1411         | 10/1/92 - 3/31/98 |

Forms A1-A9 are identical and forms B1-B9 are identical except for the periods covered. To conserve space Attachment 5 includes only A1, B1, and C. Diskettes containing the forms in a spreadsheet file will be provided to offerors upon request, and the Government-provided spreadsheets must be completed and submitted as part of your proposal. Forms must also be submitted on paper, and a complete paper set will be provided to offerors with the diskette if requested. The forms included in Attachment 5 were printed as Quattro Pro 3.0 spreadsheets. The Government-provided diskettes will be furnished as Quattro Pro 3.0, 1-2-3 2.01, 1-2-3 3.1, or 1-2-3 W spreadsheets as requested by the offeror. Also specify diskette size (3-1/2 or 5-1/4) and density (360Kb, 720Kb, 1.2 Mb, 1.44Kb). The paper forms you submit with your proposal may be printed from your completed spreadsheets; they need not have the same appearance as the examples in Attachment 5 as long as they are readable. You may change column widths, formats, fonts, etc., but DO NOT MOVE CELLS and DO NOT INSERT OR DELETE ROWS OR COLUMNS. Submit two copies of your diskette(s). In the event of any inconsistency between the diskettes and the paper forms, the paper forms will be considered the intended version.

b. Your cost proposal as represented by the Standard Forms 1411 must be prepared in accordance with your accounting system and your Cost

Accounting Standards Disclosure Statement if applicable. Submit one copy of your disclosure statement, if applicable.

c. Instructions for Cost Forms A, B, and C

(1) Offerors shall complete Forms A, B, and C in accordance with the following instructions, even though the resulting cost classifications may differ from the offeror's accounting system and practices. If these cost classifications differ from your established classification system, identify, reconcile, and explain the differences.

(2) Amounts proposed for each cost element must be separately supported by an explanation of the method by which the amount was determined. Insert "N/A" where cost elements on the forms do not apply.

(3) If escalation of any cost element is proposed, the offeror should discuss the rationale and provide the offeror's escalation history for the past three years.

(4) The offeror's proposal should not include any costs associated with relocating or installing Government-furnished property or materials.

(5) Instructions for specific items on the forms follow.

(a) Direct level of effort labor - Forms B1-B9 must be used to present your proposed direct level-of-effort labor costs, and totals from B1-B9 should be entered in the appropriate spaces in forms A1-A9. You must propose the direct productive labor hours (as defined in B.2.C.) set forth in the following table.

|                        | Period            | S.T Hours      | O.T Hrs.     | Total          |
|------------------------|-------------------|----------------|--------------|----------------|
| Initial period         | 10/1/92 - 9/30/93 | 388,125        | 3,000        | 391,125        |
| First Opt. to Extend   | 10/1/93 - 9/30/94 | 388,125        | 3,000        | 391,125        |
| Second Opt. to Extend  | 10/1/94 - 9/30/95 | 388,125        | 3,000        | 391,125        |
| Third Opt. to Extend   | 10/1/95 - 9/30/97 | 776,250        | 6,000        | 782,250        |
| 4th-9th Opt. to Extend | 10/1/97 - 3/31/98 | <u>194,064</u> | <u>1,500</u> | <u>195,564</u> |
| Total                  |                   | 2,134,689      | 16,500       | 2,151,189      |

The required direct productive labor hours above were derived by multiplying the 207 positions set forth in "Estimated Direct Labor Staffing for Instrument Support Services," under Attachment 1, by the Government's estimated productive manyear of 1,875 hours per year, and then adding 3,000 hours of overtime per year. The estimated staffing under Attachment 1 is provided for offerors' information only, and it should be clearly understood that it is NOT restrictive for proposal purposes. Each offeror should propose the staff it considers optimum for contract performance. Further, since the number of productive hours in a manyear can vary among companies, each offeror should propose a staff to meet the Government's level of effort requirements using its own productive manhours per year. DO NOT USE THE GOVERNMENT'S ESTIMATED NUMBER OF MANHOURS PER YEAR (1,875) UNLESS IT ACCURATELY REFLECTS YOUR ESTIMATED PRODUCTIVE MANYEAR. You should assume that overtime will be required equally of all direct level-of-effort staff members.

A copy of the Register of Wage Determinations and Fringe Benefits issued by the Department of Labor for employees under this proposed contract is included in Exhibit B. It should be noted that the wage rates specified therein are minimum rates. It should also be noted that the wage determination may not list all labor classes to be employed under this contract. Paragraph (a) of the Section I clause entitled "Service Contract Act of 1965" states that in this event, conformable rates must be established for those service employees to be employed under the contract but not listed on the wage determination. These conformable wage rates will be the result of a three-party agreement between the employees, Contractor, and the Government.

Any composite hourly rates on forms B1-B9 must be explained.

If you propose to subcontract any part of the required level of effort, have the prospective subcontractor complete separate SF 1411's, forms A1-A9, B1-B9, and, if applicable, C. (The prospective subcontractor should complete the forms as if it is a prime contract proposer.) The item "Subcontract Direct Level of Effort Labor Cost" on the prime proposer's forms A1-A9 should include the subcontractor's overtime and premium costs as well as its straight-time labor costs.

Any shift differential costs should be entered in the appropriate places on forms A1-A9.

(b) Direct Non-level of effort labor - This part of forms A1-A9 is for the costs of labor that will be treated as direct labor by your accounting system but is not "direct productive labor" as defined in B.2.C. It should include, if they are direct employees, the contract manager, technical manager(s), and other administrative personnel such as financial, clerical, and procurement. The Government estimates that two full-time secretaries will be needed to perform normal clerical functions. Use this part of the form also if these kinds of personnel will be dedicated 100 percent to the proposed contract but their costs will be allocated from an overhead pool applicable to the proposed contract only. Where any services of these kinds of personnel are provided through an overhead pool that allocates costs to cost objectives other than the proposed contract, enter and explain the costs under "Allocated labor other than G & A" on forms A1-A9. Where any services of these kinds of personnel are provided by subcontract, include them and explain.

(c) Fringes and Payroll Taxes - Enter the fringe benefits and payroll tax costs applicable to direct level of effort labor costs, direct non-level of effort labor costs, and any labor shown under "Allocated Labor Other than G & A." Fringe benefits and payroll taxes applicable to subcontracts for level of effort labor should be included by the prime proposer in "Costs Other than Labor, and Profit, for Subcontracts in LOE."

If it is your normal practice to account for fringe benefits and payroll taxes as direct costs, or if you intend to include these costs in a fringe benefit or overhead pool dedicated to the proposed contract only, estimate the costs for each element and enter on the forms. If these costs are part of a fringe benefit or overhead pool that will allocate to other cost objectives as well as to the proposed contract, and you normally estimate such costs by projecting a fringe



benefit or overhead rate to be applied to a base such as direct labor cost, estimate the costs according to the normal practice and divide the costs among the various individual elements in a logical manner.

(d) Costs Other than Labor, and Profit, for Subcontracts in LOE - Enter, and provide details in supporting data, all of your level-of-effort subcontractors' costs except the labor costs entered under "Subcontract Direct Level of Effort Labor" above, and the profits or fees you expect to negotiate with the subcontractors. As noted previously, any such subcontractors should complete forms A1-A9 and B1-B9.

(e) Subcontracts Other than Level of Effort - Enter the costs of any subcontracts other than those that will provide a part of the required level of effort. Any such subcontracts in excess of \$500,000 must be supported by SF 1411's and applicable cost or pricing data.

(f) Costs Subject to ODC Cost Limitation of B.3.B. - The contract will contain, at B.3.B., an Other Direct Cost (ODC) limitation applicable only to material purchases and travel costs required by Government-issued work orders. The ODC Limitation amounts are shown below. The estimated amounts for the initial contract and the options to extend are based on annual costs of \$960,000 for materials and \$50,000 for travel. Any costs not specifically covered by this limitation (e.g., taxes, material handling burden, G & A) or by another specific item on forms A1-A9 should be entered in the item "Costs Not Shown Elsewhere." The Other Direct Cost Limitation amounts that will be entered in B.3.B. and H.21 are:

|                        | Period            | Init. Cntr.<br>Opt. to Ext. | Option to<br>Increase | Total          |
|------------------------|-------------------|-----------------------------|-----------------------|----------------|
| Initial period         | 10/1/92 - 9/30/93 | 1,010,000                   | 450,000               | 1,460,000      |
| First Opt. to Extend   | 10/1/93 - 9/30/94 | 1,010,000                   | 450,000               | 1,460,000      |
| Second Opt. to Extend  | 10/1/94 - 9/30/95 | 1,010,000                   | 450,000               | 1,460,000      |
| Third Opt. to Extend   | 10/1/95 - 9/30/97 | 2,020,000                   | 900,000               | 2,920,000      |
| 4th-9th Opt. to Extend | 10/1/97 - 3/31/98 | <u>505,000</u>              | <u>225,000</u>        | <u>730,000</u> |
| Total                  |                   | 5,555,000                   | 2,475,000             | 8,030,000      |

(g) Buildings and Related Costs - Enter the costs related to your facility. It should include rent or depreciation or allocated portion thereof, property taxes if applicable, insurance, costs of modifications that will be charged to the proposed contract, utilities, telephone service, maintenance of buildings and grounds, fixtures, and security if applicable.

(h) Capital Equipment Costs/Leased Equipment Costs - Enter the costs related to vehicles and any other tangible capital equipment. Fully explain the costs and provide the rationale for the methods of acquisition selected. Provide the terms of any proposed leases.

(i) Allocated Labor Other than G & A - Enter any non-G & A labor costs that will be allocated to the proposed contract through an indirect cost pool other than one entirely dedicated to the proposed contract.

(j) City/County Business License Tax - Consult applicable local jurisdictions to determine any applicable business license taxes and enter your estimates here. Consult the City of Hampton regarding personnel to be housed at LaRC even if your facility will not be located in Hampton.

(k) Costs not Shown Elsewhere - Enter any costs not covered by one of the preceding cost elements, facilities capital cost of money, or G & A. Examples of possible entries here are material burden if applicable; and costs included in a labor overhead pool that have not been entered under "Direct Non-Level of Effort Labor" or "Fringes and Payroll Taxes."

(l) G & A - Enter G & A costs, and identify separately the rates used to determine the costs. Provide the composition of the G & A pool costs and allocation bases upon which the rates were determined. Provide G & A rate history for the preceding three fiscal years.

(m) Facilities Capital Cost of Money - Enter FCCOM if you choose to include it in your proposal (please note L.28). If you do not propose FCCOM, Clause 52.215-31, WAIVER OF FACILITIES CAPITAL COST OF MONEY (SEPT 1987) will be included in the contract.

(n) Award Fee - Enter the amounts, and provide your rationale for determining the proposed amount.

(o) Options to Increase the Level of Effort - Use Form C for the costs of the options to increase the level of effort specified by B.2. The maximum hours for the options to increase the level of effort are:

|                        | Period            | Max. Incr.<br>In LOE |
|------------------------|-------------------|----------------------|
| Initial period         | 10/1/92 - 9/30/93 | 31,875               |
| First Opt. to Extend   | 10/1/93 - 9/30/94 | 56,250               |
| Second Opt. to Extend  | 10/1/94 - 9/30/95 | 80,625               |
| Third Opt. to Extend   | 10/1/95 - 9/30/97 | 196,875              |
| 4th-9th Opt. to Extend | 10/1/97 - 3/31/98 | <u>60,000</u>        |
| Total                  |                   | 425,625              |

Estimate the costs for each period (initial period or options to extend) using the corresponding weighted average straight-time rate for the positions proposed to meet the direct productive labor hours set forth in B.2.

Please refer to the previous instructions for completing individual cost elements to make entries on Form C.

(p) Options to Increase the ODC Limitation - Provide your proposal for options to increase the ODC limitation using SF 1411's. Include IN ADDITION TO THE ODC COSTS any loading applicable to them, such as material handling burden, G & A, etc. Propose based on the amounts given under (f) above.

## 2. FACTOR 3 - RELEVANT EXPERIENCE AND PAST PERFORMANCE

You should submit a summary of your experience and performance history with respect to meeting technical objectives on schedule and within cost on related efforts. You should also submit a summary of the experience and performance history on related efforts of proposed subcontractors intended to perform a major role in the accomplishment of procurement objectives or to participate in a substantive manner. Experience is the accomplishment of work which is comparable or related to the work or effort required by this RFP. This factor includes the evaluation of overall corporate or offeror experience and past performance, but not the experience and performance of individuals who are proposed to be involved with work pursuant to this RFP. You are cautioned that omissions or an inaccurate or inadequate response to this very important evaluation factor will have a negative effect on your overall evaluation. Your summary should include the following for each related contract: contract number, contracting agency, telephone number, point of contact at agency, address, contract type, dollar value, dates contract began and ended or ends, description of contract work and explanation of relevance of work to this RFP, and actual delivery and cost performance versus delivery and cost agreed to in contract. For award fee contracts, separately state in dollars the base fee and award fee available and the award fee actually received.

## 3. FACTOR 4 - OTHER CONSIDERATIONS

a. Subfactor 1 - Financial Condition and Capability--In order for your financial responsibility to be evaluated, you must submit profit and loss statements for your last three Fiscal Years and balance sheets as of the end of your last three Fiscal Years. In addition, indicate your current credit rating, available lines of credit, sources of funds, and proposed means for financing any resulting contract.

b. Subfactor 2 - Subcontracting Plan for Small Business and Small Disadvantaged Business Concerns--The offeror (except small businesses) shall include a proposed subcontracting plan for small business and small disadvantaged business concerns for consideration in the source evaluation and selection process. The planned subcontracting amounts should be broken out and provided for each contract period, for a total contract duration of 5 years. This plan must comply with the Section I clause entitled, "Small Business and Small Disadvantaged Business Subcontracting Plan."

c. Subfactor 3 - Facility--Your attention is directed to Attachment 13, Contractor-Furnished Facility Requirements and the requirements of L.33 regarding the geographical limitation. Include evidence that you have or will have a facility by contract start date (October 1, 1992), in a location that complies with the specified geographical limitation. You should specify the size, general description and interior layout of the local facility (layout drawings should be to scale). You should describe your lease or purchase arrangements including costs, your plan for maintaining the operational status of the facility, and any options for future expansion of the facility to house all or a portion of the work force contained in the options set forth in H.21.B. Members of the Source Evaluation Board may inspect the off-site facility. Note: There will be approximately 15 Contractor personnel that will be located on-site at NASA/LaRC.

(Reference Attachment 1, Government Estimated Staffing and Position Qualifications.)

d. Subfactor 4 - Contract Terms and Conditions--The offeror should cite any proposed exceptions that he may have to the terms and conditions, together with an explanation of the basis therefor, and his proposed means for resolving any such exceptions should be discussed. This same information for any additive terms and conditions should be provided.

## SECTION M - EVALUATION FACTORS FOR AWARD

### M.1 METHOD OF EVALUATION

A. Proposals received in response to this RFP will be evaluated by a NASA Source Evaluation Board (SEB) in accordance with NASA Handbook (NHB) 5103.6B. Mission Suitability will be scored. Cost, Relevant Experience and Past Performance, and Other Considerations will not be scored. The Source Selection Official, after consultation with the SEB and other advisors, will select the offeror (or offerors) for final negotiation which he considers can perform the contract in a manner most advantageous to the Government, all factors considered.

B. Alternate Evaluation Procedures--The SEB may use evaluation procedures outlined in NHB 5103.6B or may use alternate procedures outlined in the NASA Streamlined Acquisition Handbook which dispense with initial scoring. Under the alternate procedure, proposals are initially reviewed to eliminate unacceptable proposals and determine strong and weak points, develop questions and proceed directly to written and/or oral discussion. Following questions, "Best and Final Offers," are requested. Based on the "Best and Final Offers," proposals are reexamined and scored.

C. Evaluation will be on the basis of material presented and substantiated in your proposal and not on the basis of what may be implied. Vague statements will be interpreted as a lack of understanding on the part of the offeror and/or inability to demonstrate adequate qualifications. Your attention is directed to Section L, L.38, which provides important instructions concerning proposal preparation.

### M.2 EVALUATION FACTORS

A. Factor 1 - Mission Suitability--The content of this section of your proposal will provide the basis for evaluation of your response to the technical requirements of the RFP. NOTE: Proposal risks associated with cost, schedule, and performance or technical aspects of the program will be assessed. The evaluation of risk will consider the probability of success, the impact of failure, and the alternatives available to meet the requirements. The Mission Suitability Subfactors to be considered and scored in the evaluation of your Technical/Management Proposal are set forth below:

1. Subfactor 1 - Phase-In, Staffing, Continuing Personnel Management and Non-Professional Compensation

Under this subfactor an evaluation will be made regarding the effectiveness of your plan to fully staff the contract by contract start (October 1, 1992) with qualified personnel and to obtain and make operational the non-personnel resources; e.g., facility, materials, equipment, and vehicles) required for contract performance. The excellence of your plan as it relates to minimizing changeover difficulties and ensuing maximum continuity of service to the Government will be evaluated. Consideration will be given to the excellence and timeliness of your phase-in schedule including your approach to meeting each milestone; the effectiveness and appropriateness of your proposed staffing skill mix; the extent of your personnel sources that can be brought to bear for this contract effort; and the rationale for the proposed mix of personnel sources. The excellence of your approach for maintaining competent staffing for efficient contract performance over the term of contract will also be evaluated under this subfactor. Consideration will be given to the excellence of: your recruitment and employment methods including: your plans for accommodating personnel absences and fluctuating workloads; your programs and policies for minimizing turnover and retaining experienced personnel; and your training, orientation, and career development plans, programs, and objectives. Your proposed non-professional compensation will be evaluated regarding the suitability and equitableness of the proposed compensation structure (both wages and fringe benefits) to assure that highly qualified personnel are attracted to the effort and their continued interest and employment are likely to occur. Non-professional compensation will also be evaluated to assure that the proposed compensation reflects an understanding of the requirements to be performed.

2. Subfactor 2 - Professional Compensation Plan

Your Professional Compensation Plan will be evaluated regarding the suitability and equitableness of the proposed compensation structure (both salaries and fringe benefits) to assure that highly qualified personnel are attracted to the effort and their continued interest and employment are likely to occur. The Professional Compensation Plan will also be evaluated to assure that the proposed compensation reflects an understanding of the requirements to be performed.

3. Subfactor 3 - Operations Plan

Under this subfactor, an evaluation will be made of the excellence of the offeror's management and technical approach to accomplishing the work described in the Statement of Work, Section C, including initial review of work orders, procedures for personnel assignments, and technical assessment of work in progress. An evaluation will also be made of the effectiveness of the offeror's approach to supporting urgent maintenance and calibration requests, on-line instrument and transducer verifications, personal computer and workstation maintenance and repair, calibration system and computer system software configuration control and maintenance, and daily Government/Contractor interfaces to accommodate changing LaRC needs. The excellence of the approach to accomplishing the ten (10) Representative Work Order Problems (Ref. Attachment 3 to the RFP) will be evaluated. An evaluation will be made regarding the

efficiency of the offeror's work order control system including: work order identification, tracking, and monitoring work order status; implementing changes; preventing unauthorized changes; discrepancy resolution; establishing priorities and responsiveness to changing priorities; Government/Contractor interfacing; and work order cost, man-hour, and schedule control system. The excellence of the offeror's quality and reliability program including plans for insuring that industry/Government standards are maintained; that inspections, tests, soldering, configuration control of software and hardware, and documentation standards meet the established guidelines as defined in the Statement of Work; that Center metrology programs are fully implemented; that errors are minimized; and that errors which are made are discovered, corrected, and proper action is taken to preclude their recurrence will be evaluated. An evaluation will be made regarding the efficiency of offeror's inventory control system including the approach to insuring that adequate levels of inventory are maintained and that inventoried items are properly identified, tracked, and safeguarded. The suitability of any subcontracting or teaming arrangements including the relevance of the subcontractor's or team member's qualifications, degree of subcontractor or team member commitment, and effectiveness of the proposed approach to control and integration of the subcontract effort or team effort with the prime will be evaluated. The soundness of the offeror's purchasing and subcontracting policies and procedures will be evaluated.

#### 4. Subfactor 4 - Organization

This subfactor will be used to evaluate the suitability, efficiency and effectiveness of the offeror's proposed organizational structure to manage the contract effort. The following items will be evaluated: subcontractor or teaming arrangements; lines of authority; interfacing; and the duties, responsibilities, and authorities vested in the offeror's management/supervisory team. The offeror's position descriptions, hiring vacancy announcements, or sample resumes for the first-line supervisors/group leaders will be evaluated with regard to education, experience, and other qualifications to insure that they reflect an understanding of the requirements to be performed. An evaluation will also be made regarding the extent, relevance, and availability of corporate resources or support proposed for this contract effort.

#### 5. Subfactor 5 - Key Personnel

This subfactor will be used to evaluate the education, experience, and other qualifications of the persons proposed for the positions identified in Attachment 2, as well as any other proposed key personnel. The proposed key personnels' education, experience, and other qualification will be evaluated against their proposed functions/duties and the position qualifications set forth in Attachment 1, Government Estimated Staffing and Position Qualifications. The basis for your selection and the evidence of availability at realistic compensation levels will also be evaluated.

B. Factor 2 - Cost--An analysis of the proposed cost and fee for the basic and priced option periods, and for the options for additional labor and ODC's will be conducted to determine their validity and the extent to which they reflect performance addressed in the Technical/Management proposal. Proposal risk will be considered in the Cost Factor evaluation. An assessment will be made of the

offeror's capability to accomplish the contract objectives within the estimated cost proposed. A probable cost will be developed in accordance with NHB 5103.6 for each proposal in the competitive range or, in the event the Alternate Evaluation Procedures are used, for each acceptable proposal. The reasonableness of the proposed award fee will also be determined in accordance with the guidelines set forth in NASA FAR Supplement 18-15.902. The cost proposal may be used as an aid to determine the offeror's understanding of Mission Suitability Requirements.

C. Factor 3 - Relevant Experience and Past Performance--Experience and past performance will be assessed to determine the extent to which contract objectives (including technical, schedule and cost) have been achieved on related efforts. Each performance evaluation and risk assessment will consider the number and severity of problems, the effectiveness of corrective actions taken, and the overall work record. The assessment of performance risk is not intended to be a simple arithmetic function of an offeror's performance on a list of contracts; but rather the information deemed most relevant and significant will receive the greatest consideration. Experience will be viewed as the demonstrated accomplishment of work which is comparable and relevant to the objectives of this procurement. This factor includes the evaluation of overall corporate or offeror experience and past performance, including major subcontractors, but not the experience and performance of individuals who are proposed to be involved in the required work.

D. Factor 4 - Other Considerations--The following subfactors will be evaluated based on information presented in the offeror's proposal and all other information available to NASA.

Subfactor 1 - Financial Condition and Capability--The offeror's financial position will be evaluated with regard to its soundness and to insure that adequate financial resources are available to perform this effort for the total potential period of performance.

Subfactor 2 - Small Business and Small Disadvantaged Business Subcontracting Plan--The offeror's plan will be evaluated to determine the extent of the offeror's compliance with NASA policy to afford maximum practicable opportunity for small and small disadvantaged business concerns to participate in Government contracts. NOTE: This subfactor does not apply to small business offerors.

Subfactor 3 - Facility--The offeror's proposed off-site facility will be evaluated to determine the appropriateness of the facility's size, location, and lay-out to house the necessary personnel and equipment, to facilitate the accomplishment of the contract effort, and to ensure timely response of off-site personnel to meet daily requirements for direct interface on-site. Any lease/purchase agreement will also be reviewed. NOTE: The proposed facility arrangement must meet the geographical limitation set forth in L.33 and the minimum requirements set forth in Attachment 13, Contractor-Furnished Facility Requirements.

Subfactor 4 - Contract Terms and Conditions--The proposal will be reviewed to determine the extent to which terms and conditions as set forth in the

RFP are accepted. The offeror's rationale for and the acceptability of any exceptions will be evaluated, as will the Contractor's discussion of potential conflicts of interest.

### M.3 RELATIVE IMPORTANCE OF EVALUATION FACTORS

A. The weights to be used in the scoring of the Mission Suitability Subfactors are presented below:

| <u>Subfactors</u>  | <u>Weights</u> |
|--|----------------|
| 1. Phase-In Plan, Staffing, Continuing Personnel Management, and Non-Professional Compensation | 20%            |
| 2. Professional Compensation Plan  | 5%             |
| 3. Operations Plan   | 40%            |
| 4. Organization  | 15%            |
| 5. Key Personnel   | <u>20%</u>     |
|  | 100%           |

The numerical weights assigned to the above subfactors are indicative of the relative importance of those evaluation areas. The weights will be utilized only as a guide.

B. Overall, in the selection of an offeror for negotiation leading to contract award, Mission Suitability, Cost, Relevant Experience and Past Performance and Other Considerations will be of essentially equal importance. Within Factor 2, Cost, the costs associated with the options for the additional level-of-effort, additional ODC's, and the six 1-month option periods may be considered of less significance than the costs for the initial period (including phase-in) and the first, second, and third priced options to extend the contract term.



ATTACHMENT 1

GOVERNMENT ESTIMATED STAFFING  
AND  
POSITION QUALIFICATIONS

This Attachment is a summary of the Government's estimated labor staffing requirements along with the general position descriptions and qualifications. The position descriptions identify approximate skill requirements and are included to assist offerors in the preparation of their proposals. It is noted that positions A-20 through A-26 in this attachment pertain to the work performed in response to Statement of Work areas 2.5 (Receipt and Inspection of New Instruments and Systems) and 2.6 (Instrument Pool).

**NOTE:** There is no correlation between the position levels listed herein and the levels described in the Register of Wage Determinations and Fringe Benefits (Exhibit B).

ATTACHMENT 1  
GOVERNMENT ESTIMATED STAFFING  
AND POSITION QUALIFICATIONS

ESTIMATED DIRECT LABOR STAFFING FOR  
INSTRUMENT SUPPORT SERVICES

| <u>JOB TITLE</u><br><u>Code</u> | <u>Job Title</u>   | <u>NO. OF POSITIONS</u> |               |
|---------------------------------|--|-------------------------|---------------|
|                                 |  | <u>Offsite</u>          | <u>Onsite</u> |
| A-1                             | Pressure/Flow Calibration Engineer                         | 1                       |               |
| A-2                             | Metrology/Motion Calibration Engineer                      | 1                       |               |
| A-3                             | Electric/Electronic/Temperature Calibration<br>Engineer    | 1                       |               |
| A-4                             | Field Application Engineer                                 | 3                       |               |
| A-5                             | Acoustical Systems Engineer                                | 1                       |               |
| A-6                             | Digital Systems Maintenance Engineer                       | 3                       |               |
| A-7                             | Laser Optics Engineer                                      | 1                       |               |
| A-8                             | Instrument Calibration Aide                                | 3                       |               |
| A-9                             | Calibration Engineering Technician                         | 11                      |               |
| A-10                            | Electronic Technician                                      | 89                      |               |
| A-11                            | Experimental Electronics Mechanic                          | 6                       |               |
| A-12                            | Camera Repair Mechanic                                     | 2                       |               |
| A-13                            | Engineering Technician                                     | 25                      |               |
| A-14                            | Machinist  | 1                       |               |
| A-15                            | Digital Systems Hardware Engineer                          | 6                       |               |
| A-16                            | Systems Analyst/Programmer                                 | 26                      | 8             |
| A-17                            | Engineering Draftsman                                      | 1                       |               |
| A-18                            | Technical Editors  | 2                       |               |
| A-19                            | Technical Typist   | 1                       | 1             |
| A-20                            | Electronic Technician (Instrument Control/<br>Application) |                         | 2†            |
| A-21                            | Instrument Control Clerk                                   | 1*                      | 4†            |
| A-22                            | Production Control Supervisor                              | 1*                      |               |
| A-23                            | Shipping/Receiving Clerk                                   | 2*                      |               |
| A-24                            | Clerk-Typist   | 2*                      |               |
| A-25                            | Data Entry Clerk   | 1*                      |               |
| A-26                            | Equipment Handler/Driver                                   | 1*                      |               |
| TOTAL                           |  | 192                     | 15            |

\*These 8 positions support SOW area 2.5

†These 6 positions support SOW area 2.6

## A-1

JOB TITLE: Pressure/Flow Calibration Engineer

ESTIMATED EFFORT: One (1) Position

QUALIFICATIONS:

1. Bachelor of Science degree in engineering, physics or a related field from an accredited educational institution.
2. Five (5) years experience in the calibration of laboratory reference pressure and flow standards; in calibration of absolute and differential pressure transducers; in vacuum calibrations of ionization gages, thermocouple gages, capacitance gages, and manometers and leak detection procedures; in calibration of liquid and gas flow rate instruments such as turbine flowmeters, rotameters, head type flowmeters, thermal mass flowmeters, and air velocity sensors; in calibrations of microphones in the infrasonic, ultrasonic, and audible frequency spectrum and in the calibration of gas detection sensors such as oxygen, hydrogen, and other gas detectors; in calibration using the theory of statistical error analysis and control charts; and with PC-based automatic data acquisition systems including programming in BASIC, instrument interfacing using IEEE and RS 232 interfaces, and in data reduction and presentation on PC's using BASIC and spreadsheets.

## A-2

JOB TITLE: Metrology/Motion Calibration Engineer

ESTIMATED EFFORT: One (1) Position

QUALIFICATIONS:

1. Bachelor of Science degree in engineering, physics or a related field from accredited educational institution.
2. Five (5) years experience in static calibration of length and angle dimensional gages and indicators; in static and dynamic calibration of rectilinear and angular acceleration, velocity, and displacement transducers; with mechanical, strain gage, inductive, capacitive, optical, piezoelectrical, and potentiometric sensors using centrifuges, rate tables, dividing heads, linear and angular vibration calibrators, torsion pendulums, shock calibration and environmental chambers; in determining systematic and random errors; in maintaining calibration processes in statistical control; and with PC-based automatic data acquisition systems including programming in BASIC, instrument interfacing using IEEE and RS 232 interfaces, and in data reduction and presentation on PC's using BASIC and spreadsheets.

## A-3

JOB TITLE: Electrical/Electronic/Temperature Calibration Engineer

ESTIMATED EFFORT: One (1) Position

QUALIFICATIONS:

1. Bachelor of Science degree in engineering, physics or a related field from an accredited educational institution.
2. Five (5) years experience in calibration of laboratory reference standards utilizing measurement assurance program (MAP) techniques and of precision electrical and electronic instruments utilizing techniques for the measurement of resistance, voltage, current, inductance, capacitance, impedance, attenuation, gain, frequency, power, and voltage standing wave ratio; in temperature calibrations of resistance thermometers, thermocouples and pyrometers utilizing freezing point standards, and standard thermometers; in radiant energy measurements utilizing blackbody sources, and standard lamps; in optical filters and monochromators and radiant energy computations using for example: Stefan-Boltzmann's Law, Lambert's Law of Cosines, Planck's Law; in humidity instrumentation calibration; and in calibration using the theory of statistical error analysis and control charts; and with PC-based automatic data acquisition systems including programming in BASIC, instrument interfacing using IEEE and RS 232 interfaces, and in data reduction and presentation on PC's using BASIC and spreadsheets.

## A-4

JOB TITLE: Field Application Engineer

ESTIMATED EFFORT: Three (3) Positions

QUALIFICATIONS:

1. Bachelor of Science Degree in engineering, physics or a related field from an accredited educational institution.
2. Six (6) years experience in the application and maintenance of electronic, electro-optical and electromechanical research instrumentation systems; in performing measurements of pressure, acceleration, force, flow rate, frequency, velocity, and current; in use of multichannel data acquisition systems, and the determination of accuracy, precision, hysteresis, resolution, scale factor, and parameters. Familiar with the RS 232 standard digital interfaces and capable of the implementation in connecting peripheral equipment to a computer-based system capable of performing

basic programming to test and verify proper communications over these bus standards.

#### A-5

JOB TITLE: Acoustical Systems Engineer

ESTIMATED EFFORT: One (1) Position

#### QUALIFICATIONS:

1. Bachelor of Science degree in engineering, physics or a related field from an accredited educational institution.
2. Six (6) years experience in general measurements; three (3) years of this experience with sound pressure measurements and signal processing; experience in transient and dynamic measurements; two (2) years experience in computer programming and application of personal computers in measurement systems.

#### A-6

JOB TITLE: Digital Systems Maintenance Engineer

ESTIMATED EFFORT: Three (3) Positions

#### QUALIFICATIONS:

1. Bachelor of Science degree in Electronic Engineering or a related field from an accredited educational institution.
2. Six (6) years experience in computer controlled data acquisition process control and systems work, and in the use and maintenance of standard peripheral equipment such as digital voltmeters, x-y plotters, laser and line printers, card readers, interactive terminals, disk drives, magnetic tape systems, display devices, solid state memory, microprocessors, workstations, personal computers, and custom hardware interfaces; experience with loading, running, and interpreting software diagnostics; repair of solid state, high speed digital logic circuitry, low level amplifiers, high speed analog-to-digital converters and counters, and real-time computer systems which perform major functions of data acquisition, real-time display, automatic control, and batch reduction.

## A-7

JOB TITLE: Laser Optics Engineer

ESTIMATED EFFORT: One (1) Position

QUALIFICATIONS:

Master of Science degree in Electrical Engineering/Physics or a related field from an accredited institution. Eight (8) years experience with lidar systems and lidar techniques including use of lasers, design of lidar systems, analyses and interpretation of lidar data, lidar simulation techniques, design of lidar data acquisition systems, lidar field experiments (ground based and airborne), and development and design of space qualified lidar systems.

## A-8

JOB TITLE: Instrument Calibration Aide

ESTIMATED EFFORT: Three (3) Positions

QUALIFICATIONS:

1. High school diploma or equivalent.
2. Two (2) years experience in instrumentation calibration. Experience in operating PC-based automated calibration dedicated to unique, high volume instrumentation. Experience with soldering and preventive maintenance procedures for general purpose test equipment.

## A-9

JOB TITLE: Calibration Engineering Technician

ESTIMATED EFFORT: Eleven (11) Positions

QUALIFICATIONS:

1. High school diploma or equivalent.
2. Two (2) years academic work in an engineering or physics field or graduated from an accredited educational institution; or, an apprentice school, or a diploma from

accredited technical institute; or, three (3) years equivalent experience including two (2) years experience with an Instrument Support Laboratory. One (1) year experience in operating PC's and PC-based automatic data acquisition systems including computers and instruments interfaced through IEEE or RS 232 interfaces.

3. Three (3) years additional specialized experience as follows:

A. Estimated Effort: One (1) Position Experience in calibration of laboratory reference liquid and gas flow standards; in determining temperature, pressure density, viscosity, compressibility, specific heat, and Reynolds number; in the use of manometers, barometers, frequency meters, and in calibrating flowrate instruments utilizing magnetic, thermocouple, orifice, and venturi principles; and in calibration using the theory of statistical error analysis.

B. Estimated Effort: Two (2) Positions

Experience in calibration of precision electrical and electronic measuring instruments using basic techniques for the measurement of current, voltage, resistance, frequency, inductance, capacitance, attenuation, pulse time, instantaneous and average power, common mode rejection and impedance; in calibration of devices such as oscillators, amplifiers, attenuators, radio frequency signal generators, receivers, counters, voltmeters, Wheatstone bridges, spectrum analyzers, oscilloscopes, digital and programmable current and voltage sources, frequency meters, potentiometers, volt boxes, resistance boxes, standard cells, and capacitors. At least one (1) shall have one (1) year's experience in performing precision measurements required in the operation of measurement assurance program certification of reference standards.

C. Estimated Effort: Three (3) Positions

Experience in calibration of laboratory reference standards such as dead weight testers and manometers, and absolute and differential pressure transducers; in calibration utilizing the theory of statistical error analysis and experience in the use of specialized vacuum equipment, precision electronic and mechanical measuring equipment and desktop calculators and instrument controllers.

D. Estimated Effort: One (1) Position

Experience in precision dynamic and static calibration of linear accelerometers, angular accelerometers, and rate gyros; in calibrating and using Newton's Laws of Motion, Hooke's Law, electrical and electronic circuitry, SI or engineering units and handling the normal accelerometer calibration problems associated with simple harmonic motion, damped motion, rotary motion, tangential and centripetal accelerations, knowledge of machine design practices and test circuit design.



E. Estimated Effort: One (1) Position

Experience with basic acoustical calibrations of microphones in the infrasonic, ultrasonic, and audible frequency spectrum; in measuring sound power, sound intensity, directivity and acoustical impedance in the free field; in determining errors of sound measurement related to reverberant and diffuse sound fields, harmonic distortion, frequency response, and environmental conditions of extraneous vibrations, temperature and humidity. Experience with the use of standard microphones.

F. Estimated Effort: One (1) Position

Experience in calibration of optical and mechanical instruments for the measurement of linear and angular dimensions and surface finishes; with linear and angular gage blocks, sine bars, micrometer calipers, height gages, monochromatic light sources, optical flats, fringe count micrometers, autocollimators, transits, clinometers, linear and angular motion transducers, dividing heads, optical polygons, theodolites, contour projections, ring, plug and thread gages and experience with associated electrical and electronic amplifying and readout equipment; with setup techniques, measurement methods, error analysis, corrections, and adjustments.

G. Estimated Effort: Two (2) Positions

Experience in instrument calibration for the measurement of temperature, heat flux, and radiant spectral energy; in calibration of neutral density and interference filters and the energy transmission of optical components; in setting up radiant energy sources and detectors; in the computation of measured energy using applicable laws, such as Stefan Boltzmann's Law, Lambert's Law of Cosines, and Planck's Law; experience with resistance thermometers, Mueller bridges, high temperature furnaces, freezing point standards, optical pyrometers, low noise amplifiers, blackbody sources, and standard radiance lamps.

A-10

JOB TITLE: Electronics Technician

ESTIMATED EFFORT: Eighty-nine (89) Positions

QUALIFICATIONS:

1. High school diploma or equivalent.
2. Graduated from a technically relevant class "A" military service school or an accredited technical institute or equivalent.

3. Four (4) years general electronic maintenance and repair experience, as well as four (4) years additional specialized experience as follows:

A. Estimated Effort: Thirteen (13) Positions

Experience with the repair, application, and calibration of various commercial electronic laboratory equipment, such as AM and FM telemetry receivers, discriminators, phase angle meters, differential amplifiers, electronic AC voltmeters, pulse and square wave generators, AF and RF signal generator oscilloscopes, RF power measuring devices, vibration test equipment, universal counter-timers, tape recorders, carrier amplifiers systems, x-y plotters, digital printers, electronic bridges, wave analyzers.

B. Estimated Effort: Eight (8) Positions

Experience in analyzing electronic instrument specifications; capable of understanding the operation of current laboratory electronic test equipment; of devising means for testing electronic equipment to ascertain compliance with manufacturer and/or NASA procurement specifications.

C. Estimated Effort: Four (4) Positions

Experience in the repair, maintenance, and modification of multichannel magnetic data tape analog and digital recorders.

D. Estimated Effort: Sixty (60)

Positions Experience with repair, preventive maintenance, system diagnostics, modification of hardware, installation, and testing of computerized digital data acquisition display and control systems and related interfaces and peripheral devices.

Factory training, which teaches skills and knowledge required to operate and perform corrective and preventive maintenance, and an in-depth working knowledge of the internal logic functions of computers, data systems, and interactive display terminals is required for these positions. The following is the estimated number of personnel for which factory training is required: Dec Vax 11/750 and 11/780 (1), Modcomp Classic Family (8), HP digital systems (6), DEC Microvax(3), Dec Vax 8650 (1), VME based products (3), Sun Workstations (3), and DEC and Silicon Graphics workstations (6).

E. Estimated Effort: Four (4) Positions

Experience in the application of laboratory test equipment such as voltmeters, electrometers, oscillators, pulse generators, oscilloscopes, differential amplifiers, data tape records, time code generators, electronic counters, and for measurement of static and dynamic test parameters.

## A-11

JOB TITLE: Experimental Electronics Mechanic

ESTIMATED EFFORT: Six (6) Positions

QUALIFICATIONS:

1. High school diploma or equivalent.
2. Graduated from an accredited apprentice school or technical institute, including courses in electronics, physics, chemistry, and strength of materials, or equivalent combined experience and education.
3. Four (4) years general experience in the construction or repair of precision mechanical, electronic, electrical, electromechanical, mechanical-optical, and electro-optical components, indicators, and recorders, in handling small parts and specialized materials such as gage wire, diaphragms, small connectors, lead wire, gaskets, and damping oils; specific experience including the machining and fabrication of special replacement instrument parts; repair and assembly; test and adjustment of mechanical pressure instruments; precise adjustments for sensitivity damping, temperature compensation relating to mechanical and mechanical-optical type instruments; assembly, adjustment and repair of electrical meters such as circuits analyzers, Wheatstone bridges, potentiometers, resistance boxes; assembly and disassembly of bonded and unbonded strain gage instruments.

## A-12

JOB TITLE: Camera Repair Mechanic

ESTIMATED EFFORT: Two (2) Positions

QUALIFICATIONS:

1. High school diploma or equivalent.
2. Graduated from an accredited apprentice school or technical institute, including courses in electronics, physics, and strength of materials, or equivalent combination of experience and education.
3. Four (4) years experience in repair, modification, and maintenance of framing cameras, standard and high-speed movie cameras, related camera components such as shutters, irises, film drive sprockets, and related equipment such as electronic

strobe light systems and sound amplifiers; experience with special tools and necessary skills to repair electro-optical-mechanical instruments and to use special test equipment for testing focal length, shutter speeds, framing rate, and proper synchronization of working parts; experience in disassembling, repairing, and reassembling compound lenses, in cleaning and applying antireflectance coatings to lenses, in repairing photographic diaphragms and shutters, and photoelectric components, and in machining and fabricating small parts.

### A-13

JOB TITLE: Engineering Technician

ESTIMATED EFFORT: Twenty-five (25) Positions

#### QUALIFICATIONS:

1. High school diploma or equivalent.
2. Graduated from an accredited apprentice school or technical institute including the study of mathematics, physics, mechanics, and electronics, or equivalent of combined experience or education.
3. Four (4) years experience in maintenance or application of electronic and electromechanical instrumentation, as well as four (4) years additional specialized experience as follows:

#### A. Estimated Effort: Twelve (12) Positions

Experience in the selection, application, installation, operation, field calibration, repair, and evaluation of electromechanical instrumentation components and systems, including operating instrument systems to measure test variables such as pressure, temperature, flow rate, displacement, velocity, acceleration, force, resistance, voltage, current, and frequency; experience with: selecting proper transducers, mounting hardware, constructing mockups, signal conditioning, cabling, connecting through patchboards, interfacing, adjusting zero sensitivity and bridge balance, evaluating system performance, and presenting records of work accomplished to supervisor.

#### B. Estimated Effort: Three (3) Positions

Experience with measuring pressure phenomena using capacitance, inductance, variable reluctance, thermocouple, piezoelectric and wire strain gage type pressure transducers with all types of recording media. One (1) of these positions requires one (1) year experience in application of pressure scanning valves and Mach meters.

C. Estimated Effort: Two (2) Positions

Experience in the measurement and recording of temperature utilizing resistance thermometers, freezing point standards, thermocouples, optical pyrometers, radiometers, and gas chromatographs.

D. Estimated Effort: Three (3) Positions

Experience in flow measurement, recording, and visualization including: setting up optics, light sources, high voltage power supplies, electron beam devices, photodetectors, lasers, and controls necessary for schlieren photographs, recording and indication of fluid phenomena; application of in-line flowmeters such as orifice meter, thermal mass flowmeters and rotameters for measuring pipe fluid flowrates.

E. Estimated Effort: Five (5) Positions

Experience in the application, maintenance, and calibration of sound pressure measurement instrumentation (including microphones) in both a laboratory and field environment; experience with setup, checkout, analysis of acoustic sensors; experience in analog and digital electronics; experience with personal computer maintenance; operational experience with personal computers in measurement systems.

A-14

JOB TITLE: Machinist

ESTIMATED EFFORT: One (1) Position

QUALIFICATIONS:

1. High school diploma or equivalent.
2. Graduated from an accredited technical institute or apprentice school, including courses in physics, and strength of materials, or equivalent of combined experience or education.
3. Four (4) years of experience in machine work as a journeyman machinist using conventional machine shop tools; knowledge of cutting characteristics of commonly used metals and of shop practices including all phases of the machinist trade

## A-15

JOB TITLE: Digital Systems Hardware Engineer

ESTIMATED EFFORT: Six (6) Positions

QUALIFICATIONS:

1. Bachelor of Science degree in Electrical Engineering or a related field from an accredited educational institution.
2. Five (5) years experience in computerized digital data acquisition and control systems and PC and workstation systems including three (3) years experience in mini-computers listed in 2.3 of the Statement of Work; experience with engineering evaluation of prototype hardware, complete system design, developing system specifications, design modifications, and interface and system integration into facilities. Expertise is also required in hardware design and systems integration with VME and other current bus technology products. Demonstrated experience with third party board and peripheral device hardware integration, the use of CAD/CAM systems for hardware design and documentation control, and familiarity with noise reduction techniques and instrumentation system signal quality analysis are also required

## A-16

JOB TITLE: Systems Analyst/Programmer

ESTIMATED EFFORT: Thirty-four (34) Positions

QUALIFICATIONS:

Bachelor of Science degree in Electrical Engineering, Computer Science, or a related degree from an accredited educational institution.

A. Estimated Effort: Eight (8) Positions Senior systems analyst having at least four (4) years experience in operating systems on MODCOMP (MAX IV and MAX 32 (4 positions minimum), DEC (VMS and ULTRIX), Hewlett Packard (HP-UX and BASIC), and Unix or Posix based real-time operating systems. At least five of these positions shall have demonstrated experience with Unix or Posix based real-time operating systems and the C programming language. Experience shall include designing custom handlers and device drivers, networking software, system performance analysis, and configuration control.

**B. Estimated Effort: Seven (7) Positions**

Senior systems analyst having at least three (3) years experience with the implementation of real-time data acquisition and control software on Modcomp (4 positions minimum), Hewlett Packard, and Unix or POSIX based real-time computer systems. Experience shall include organizing and directing the execution of programming tasks performed by applications programmers, definition of systems requirements, top level and detail programming design, and organizing and preparing program documentation. Experience shall include software design for high speed analog front ends, real-time display and graphics system, implementation of control systems, and process control software. Design application experience with CASE tools, graphical user interfaces (e.g., X windows, MOTIF), and object oriented programming techniques in a POSIX or Unix operating system environment is highly desirable.

**C. Estimated Effort: Ten (10) Positions**

Senior programmer having at least three (3) years experience with the implementation of real-time applications programs on Modcomp (4 positions minimum) and Unix or POSIX based real-time computer systems. Shall have experience with instrumentation and data processing related to wind tunnel research, including the processing and graphical representation of force measurement data, pressure coefficient data, application of numerical methods and techniques, automatic calibration software, and data base processing techniques in a real-time environment.

**D. Estimated Effort: Eight (8) Positions**

Applications programmer having at least two (2) years experience on primarily Modcomp (4 positions minimum), DEC VAX, and Hewlett Packard, and Unix or POSIX based real-time computer systems. Experience shall include applications involving development of data acquisition and control software including coding, integration, testing, debugging, and continuing maintenance and configuration control of software systems.

A-17

**JOB TITLE:** Engineering Draftsman

**ESTIMATED EFFORT:** One (1) Position

**QUALIFICATIONS:**

1. Graduated from an accredited technical school, or shall have completed a four (4) year apprentice program in drafting. Courses should have included drafting,

mechanical drawing, mathematics, physics, strength of materials, elements of mechanics and electricity.

2. Five (5) years experience in mechanical drawing and drafting, at least two (2) years of which should have been engineering design drafting; should also have experience in schematic drawings of electrical and electronic circuitry and computer aided design and drafting systems.

#### A-18

JOB TITLE: Technical Editor

ESTIMATED EFFORT: Two (2) Positions

#### QUALIFICATIONS:

1. BA in English or relevant field.
2. Three (3) years experience in documentation for digital data systems, including system user manuals, theory of operation manuals, hardware and software manuals defining systems requirements, system design, statements of work, software conversion studies and related automatic data processing equipment documentation.

#### A-19

JOB TITLE: Technical Typist

ESTIMATED EFFORT: Two (2) Positions

#### QUALIFICATIONS:

1. High school diploma or equivalent.
2. Three (3) years experience in technical typing, preferably with digital systems documentation. Proficient in the use of word processors, electric typewriters, and copy machines. One (1) position shall be experienced with the use of an information management system on personal computers (e.g., Symphony, DBASE, and Lotus) and be cognizant of configuration control procedures for tracking software maintenance, manual updates, media library, and other configuration and project management information.



## A-20

JOB TITLE: Electronics Technican (Instrument Control/Application)

ESTIMATED EFFORT: Two (2) Positions

QUALIFICATIONS:

1. High school diploma or equivalent.
2. Graduated from a technically relevant class "A" military service school or an accredited technical institute or equivalent.

Experience in the application of laboratory test equipment such as voltmeters, oscilloscopes, amplifiers, data tape records. Experience with the use of an information management system on personal computers (e.g., dBase, NMIS, Mettrack, and Quatro) and be familiar with required operational requirements and software. Experience in a property management environment dealing with the accountability, maintenance, disposal, and recall of equipment.

## A-21

JOB TITLE: Instrument Control Clerks

ESTIMATED EFFORT: Five (5) Positions

QUALIFICATIONS:

1. High school diploma or equivalent.
2. Three (3) years experience in general office work, at least one (1) of which should have been in an environment dealing with instrumentation and shall be familiar with instrument technology.
3. Proficient in operating office equipment such as personal computers, optical scanners, and reproduction machines. Shall have experience in operating interactive computer terminals.

## A-22

JOB TITLE: Production Control Supervisor

ESTIMATED EFFORT: One (1) Position

QUALIFICATIONS:

1. High school diploma or equivalent.
2. Five (5) years experience in receiving, scheduling, routing and maintaining production records dealing with work as described in applicable Statement of Work. Two years experience in supervising personnel performing such work.

## A-23

JOB TITLE: Shipping/Receiving Clerk

ESTIMATED EFFORT: Two (2) Positions

QUALIFICATIONS:

1. High school diploma or equivalent.
2. Two (2) years experience in handling income and outgoing shipments of delicate electronic instrumentation and associated peripherals. Knowledge of proper handling and packing procedures for such items. Experienced in the various types of shipping methods such as motor freight, parcel post, UPS and air freight.

## A-24

JOB TITLE: Clerk/Typist

ESTIMATED EFFORT: Two (2) Positions

QUALIFICATIONS:

1. High school diploma or equivalent.
2. Two (2) years experience in general office work. Capable of typing 40 words per minute.

## A-25

JOB TITLE: Data Entry Clerk

ESTIMATED EFFORT: One (1) Position

QUALIFICATIONS:

1. High school diploma or equivalent.
2. Two (2) years experience in operating personal computers.

## A-26

JOB TITLE: Equipment Handler/Driver

ESTIMATED EFFORT: One (1) Position

QUALIFICATIONS:

1. High school diploma or equivalent.
2. Two (2) years experience in the handling and transporting of delicate electronic instrumentation. Valid Virginia vehicle operator's permit with exemplary driving record.

ATTACHMENT 2  
KEY PERSONNEL REQUIREMENTS

ATTACHMENT 2  
KEY PERSONNEL REQUIREMENTS

Presented in this attachment are position requirements for Key Personnel for which **resumés are required.**

Key personnel are those individuals proposed for the following positions:

- (a) Contract Manager
- (b) Technical Manager(s)

**The number of Key Personnel is dependent on an offeror's proposed organizational structure.**

## KEY PERSONNEL REQUIREMENTS

1 4 2

**JOB TITLE:** Contract Manager

**DUTIES:** The position involves the overall planning, direction, coordination, and administration of instrument support services under this contract.

### **QUALIFICATIONS:**

A Bachelor of Science degree in engineering, physics, mathematics, computer science, or a related field from an accredited institution, or appropriate equivalent experience. Additional academic background in business is desirable. In addition to the academic requirements, the Contract Manager should have a minimum of ten (10) years of appropriate professional experience related to one or more of the technical areas described in the Statement of Work. Four (4) years of this experience should have been in supervising and managing technical personnel performing work similar to that contained within the Statement of Work. At least one (1) year of this experience should have included managerial, technical, and administrative duties that were commensurate with the position of Contract Manager on a contract of the size and diversity of this proposed effort.

**JOB TITLE:** Technical Manager(s)

**DUTIES:** The position(s) involve(s) planning, direction, and coordination of instrument support services under this contract, with the incumbent(s) reporting directly to the Contract Manager.

### **QUALIFICATIONS:**

A Bachelor of Science degree in physics, engineering, mathematics, computer science, or a related field from an accredited institution, or appropriate equivalent experience. Should have eight (8) years of appropriate professional experience relevant to the Statement of Work area(s) for which an incumbent may be responsible. At least three (3) years of this experience should have been in a supervisory role.

ATTACHMENT 3

REPRESENTATIVE WORK ORDER PROBLEMS #1 - #10

## ATTACHMENT 3

## Representative Work Order Problems

| Representative Work Order No. | Representative Work Order Problems        |
|-------------------------------|---|
| 1                             | Data Acquisition System Design            |
| 2                             | Acoustic Measurement Test                 |
| 3                             | Datametrics Instrumentation System        |
| 4                             | Installation of PSI ESP System            |
| 5                             | Repair of Silicon Graphics Workstation    |
| 6                             | Repair Apple PC                           |
| 7                             | Repair MODCOMP Main Frame Computer        |
| 8                             | Calibrate Platinum Resistance Thermometer |
| 9                             | Acceptance Test Sundstrand Accelerometer  |
| 10                            | Repair and Calibrate HP Multimeter        |



REPRESENTATIVE WORK ORDER PROBLEM NUMBER 1

Work Order Requirement: The Government has a requirement to provide an operational real-time data acquisition system to support a new wind tunnel which will operate in the Mach 8 to 10 range. The primary functions of this system will be to acquire, display, and record analog, digital, and pressure data and provide real-time engineering unit calculations and computed parameters for real-time display and archiving of tunnel data and networking to workstations for final analysis. The operational schedule requires the system to be ready one (1) year from the date of this work order. All necessary hardware and components should be considered as already delivered and available. The contractor has been issued a work order to implement the data system.

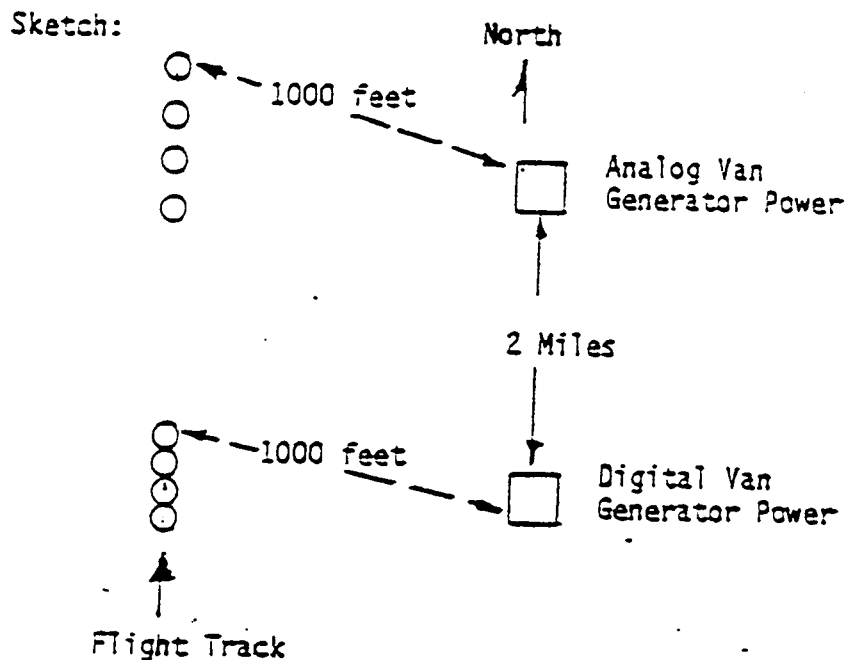
Government Assumptions:

1. Hardware requirements have already been determined and all necessary hardware and components have been delivered.
2. The software required takes 250,000 source lines of which 200,000 lines are available from existing library of software.
3. Hardware and software delivered as follows:
  - a. MODCOMP Model 9250 dual bus CPU with 16 Mbytes of memory.
    - Max/32 operating system
    - Two 600 Mbyte removable disk drives
    - One 1000 line/min. line printer
    - Two 9 track 1600/6250 BPI tape drives
    - TCP/IP network controller
    - One Sun Model 360 workstation with Sun O/S
    - Five general purpose terminals
  - b. Neff Model 500/600 analog and digital front end with 128 analog and 32 digital channels (no existing interface).
  - c. ESP Model 780B with 512 pressure channels
  - d. ESP Model 8400 with 1,024 pressure channels
  - e. Scanivalve, 6 drives with 6 valves with 48 ports each
  - f. Six ISC real-time color monitors
  - g. Neff 490 transient data recorder (10 channels)
  - h. Necessary components for interfacing

RESPONSE: Respond to criteria A, B5, B6, B8, B9, B10, C1, C2, and D1 as defined in L.38, Factor 1, Mission Suitability; C, Subfactor 3, Operations Plan, Paragraph (1).

REPRESENTATIVE WORK ORDER PROBLEM NUMBER 2

Work Order Requirement: Make noise measurements using two instrumented vans: one analog with 9 each 10 KHz bandwidth microphones positioned 200-feet apart. One digital van with 9 each 1 KHz bandwidth microphones positioned 1-foot apart, recorded at 2,500 samples/second. All microphones shall be omnidirectional, mounted on constant impedance surfaces on the ground such that the flight path is in the plane of the microphone diaphragms. Wind screens shall be used. Annotate data tapes. Stored data synchronization between vans shall be within 10 milliseconds. All microphone cables shall be 1,000-foot long and staked. Vans will be located at the Rob site with project engineer directing the test from the Harriet site 12-miles away. Surface meteorological data shall be taken at the Rob site and recorded, and meteorological data at 1000-feet shall be taken at the Harriet site, Operations Support Division Operator. Aircraft tracking shall be set up and tracking data recorded. Requirements believed special are: (1) make ground impedance measurements at the Rob site, both van locations; (2) contingency plan for analog van data recorder failure and digital van generator failure; (3) security clearances required. Special data analysis requirements are for two channels of real time narrow-band analysis with plots.



RESPONSE: Respond to A, B1, B6, B7, B11, B12, and D2 as defined in L.38, Factor 1, Mission Suitability; C, Subfactor 3, Operations Plan, Paragraph (1).

REPRESENTATIVE WORK ORDER PROBLEM NUMBER 3

Work Order Requirement: Set up a Datametrics Barocel system consisting of three channels of pressure measurement. The full scale ranges are 10 torr, 100 torr and 1000 torr absolute. The output from all three channels are to be interfaced to an existing MODCOMP computer through a Neff 600/620 A/D converter. After setup, verify system for proper operation.

Date Initiated: 9/16/91

Date Required: 9/19/91

RESPONSE: Respond to criteria A, B7, B10, B11, B12, and D1 as defined in L.38, Factor 1, Mission Suitability; C, Subfactor 3, Operations Plan, Paragraph (1).

REPRESENTATIVE WORK ORDER PROBLEM NUMBER 4

Work Order Requirement: Assemble, setup, and verify operation of a 96-channel Pressure Systems, Inc. Model 8400 electronically scanned pressure system to acquire 64-channels of 10-inches of water column differential pressure and 32-channels of 5 psia pressure. System contains three calibration standards of 1 psid, 5 psid, and 5 psia respectively.

Date Initiated: 9/16/91

Date Required: 9/27/91

RESPONSE: Respond to criteria A, B3, B7, B10, B11, B12 and D1 as defined in L.38, Factor 1, Mission Suitability; C, Subfactor 3, Operations Plan, Paragraph (1).

SAMPLE WORK ORDER 5

Work Order Requirement: Repair Silicon Graphics, Inc. workstation Model 4D/120 stationed at LaRC. Memory control board MC-2 failed. There is no video. There is no spare board available.

Date Initiated: 9/10/91

Date Required: 9/14/91

RESPONSE: Respond to criteria A, B3, B11, C2, and D1 as defined in L.38, Factor 1, Mission Suitability; C, Subfactor 3, Operations Plan, Paragraph (1).

REPRESENTATIVE WORK ORDER PROBLEM NUMBER 6

Work Order Requirement: Repair personal computer, Apple Model Number MAC II FX located at LaRC. The system has parity errors. The system will not boot and is down. The hard drive has failed and is not under warranty. There a 250 systems at LaRC.

Date Initiated: 9/10/91

Date Required: 9/17/91

RESPONSE: Respond to criteria A, B3, B11, C2, and D1 as defined in L.38, Factor 1, Mission Suitability; C, Subfactor 3, Operations Plan, Paragraph (1).

REPRESENTATIVE WORK ORDER PROBLEM NUMBER 7

Work Order Requirement: Repair MODCOMP, Model 9250 main frame computer located at LaRC. The system crashes after writing to the disk drive. The system is down. This is classified as a priority system. There are 50 systems at LaRC. Technician overtime if approved.

Date Initiated: 9/9/91

Date Required: 9/10/91

RESPONSE: Respond to criteria A, B3, B11, C2, and D1 as defined in L.38, Factor 1, Mission Suitability; C, Subfactor 3, Operations Plan, Paragraph (1).

REPRESENTATIVE WORK ORDER PROBLEM NUMBER 8

Work Order Requirement: Calibrate platinum resistance thermometer, Leeds and Northrup Model 8167. Provide calibration constants to establish temperature and resistance relationship.

Date Initiated: 9/16/91

Date Required: 9/30/91

RESPONSE: Respond to criteria A, B1, B2, B3, and D1 as defined in L.38, Factor 1, Mission Suitability; C, Subfactor 3, Operations Plan, Paragraph (1).



REPRESENTATIVE WORK ORDER PROBLEM NUMBER 9

Work Order Requirement: Acceptance test accelerometer, Sundstrand, Model Number QA2000 to the following specifications:

a. Bias shall not exceed 0.004 G. Bias shall not shift more than 30 micro-G/degree C.

b. Sinusoidal rectification errors in any axis shall not exceed 20 micro-G/G squared from 50 to 500 hertz and 60 micro-G/G squared from 500 to 2000 hertz.

c. Nonlinearity and hysteresis shall not exceed 20 micro-G when ranged for +/- one G.

Date Initiated: 10/07/91

Date Required: 10/15/91

RESPONSE: Respond to criteria A, B1, B2, B3, and D1 as defined in L.38, Factor 1, Mission Suitability; C, Subfactor 3, Operations Plan, Paragraph (1).

REPRESENTATIVE WORK ORDER PROBLEM NUMBER 10

Work Order Requirement: Repair and calibrate digital multimeter, HP Model 3478A.  
The 10's digit is inoperative.

Date Initiated: 2/12/92

Date Required: 2/22/92

RESPONSE: Respond to criteria A, B1, B2, B3, B4, and D1 as defined in L.38,  
Factor 1, Mission Suitability; C, Subfactor 3, Operations Plan, Paragraph (1).

ATTACHMENT 4

GOVERNMENT EQUIPMENT TO BE FURNISHED UNDER A FACILITY CONTRACT

## GOVERNMENT-FURNISHED EQUIPMENT

This list is representative of the current Government-Furnished Equipment (GFE) to be housed at the Contractor's facility. The acquisition cost of the GFE (3,022 items) is in excess of \$5.6M. The numbers and types of items vary with time and changing program requirements.

G F E DATA BASE REPORT  
Full Listing

PAGE: 1

12

| Manufacturer Name    | Model     | Description          | Acquisition Cost |
|----------------------|-----------|----------------------|------------------|
| INNOVENTIONS         | 1 MEG     | RAM ADAPTER          | 149.00           |
| INNOVENTIONS         |           | RAM SPEED VERIFIER   | 169.00           |
| ONAN                 | 3-0AJ-1   | GENERATOR            | 610.20           |
| HI-TEK               | RT-101    | KEYBOARD             | 90.00            |
| STANDARD             | MCH-4095N | MONITOR              | 475.00           |
| HEWLETT-PACKARD      | 5254C     | CONVERTER            | 925.00           |
| B & K                | 2426      | VOLTMETER            | 1,600.00         |
| IBM                  | 5150      | COMPUTER W/KEYBOARD  |                  |
| TEKTRONIX            | 190B      | SG CONST AMPL.       | 400.00           |
| CINE                 | 25MM      | SPL LENS             | 50.00            |
| IRCON                | 3T06F     | TEMP CONTROLER       | 951.00           |
| TEKTRONIX            | SG503     | GENERATOR            | 1,568.12         |
| HEWLETT PACKARD      | 9122D     | DISK DRIVE           | 955.00           |
| FLUKE                | 8810A     | MULTIMETER           | 1,238.40         |
| SUN                  | 3/160     | COMPUTER             | 19,625.00        |
| LEAR-SIEGLER         | ADM-11    | MONITOR W/KEYBOARD   |                  |
| IBM                  | 3174-51R  | COMPUTER CONTROLLER  | 3,540.00         |
| B & K INSTRUMENTS IN | 4134      | MICROPHONE           | 210.00           |
| B & K INSTRUMENTS IN | 4134      | MICROPHONE           | 210.00           |
| HEWLETT PACKARD      | 3497A     | DATA ACQUISITION SYS | 5,939.31         |
| B & K                | 4134      | MICROPHONE           | 908.00           |
| HEWLETT PACKARD      | 7440A     | PLOTTER, GRAPHICS    | 968.00           |
| UNION CARBIDE        | 50LD      | LIQUID NITROGEN REFR | 606.00           |
| TEKTRONIX            | K         | PLUG IN AMP          | 147.00           |
| B & K INSTRUMENTS IN | 2426      | VOLTMETER AC         | 1,600.00         |
| RAYTHEON             | VR6111C   | VOLT REGULATOR       | 27.40            |
| GEIER & BLUHM        | NONE      | LEVEL                | 79.00            |
| BELL & HOWELL        | SR900     | FILM READER          | 183.00           |
| HEWLETT PACKARD      | 13219A    | DISC UNIT            | 885.00           |
| MAX TECH             | PB64      | BUFFER               | 89.00            |
| HEWLETT PACKARD      | 3495A     | RELAY SCANNER        | 2,821.50         |
| TEKTRONIX            | SC501     | OSCILLOSCOPE         | 900.00           |
| HASTINGS             | GV-3      | VAC GAGE             | 114.00           |
| RFL                  | 829       | CALIB. STD.          | 2,657.40         |
| KROHN HITE           | 5600      | GENERATOR            | 703.65           |
| CML-MACARR           | MOS-1     | FREQ.STABLIZER       | 2,460.15         |
| FLOW DYNE            | N160170   | SONIC NOZZLE         | 250.00           |
| FLUKE                | 8800A     | MULTIMETER           | 1,066.03         |
| B & K INSTRUMENTS IN | 4133/S    | MICROPHONE           | 447.00           |
| FLUKE                | 77        | MULTIMETER, DIG.     | 116.10           |
| CRAFTSMAN            | 52095     | TAP & DIE SET        | 38.99            |
| BUCHANAN             | H-2715    | CRIMP TOOL           | 252.00           |
| DEC                  | LA50      | PRINTER              | 510.00           |
| LASER PRECISION      | RS5900    | RADIOMETER           | 6,900.00         |
| HEWLETT PACKARD      | 6237B     | POWER SUPPLY         | 715.00           |
| TEKTRONIX            | 7D01F2    | LOGIC ANALYZER       | 5,272.88         |
| B & K INSTRUMENTS IN | 2619      | PREAMPLIFIER         | 442.00           |
| SHALLCROSS           | 6863      | PRE. RES. DEC.       | 190.00           |
| TEKTRONIX            | T922      | OSCILLOSCOPE         | 1,301.29         |
| B & K INSTRUMENTS IN | 2639S     | MICROPHONE AMP       | 737.00           |
| IWATSU               | SS6122    | OSCILLOSCOPE         | 1,721.00         |
| VEECO                | SC-4      | PRESS. CALIBRA       | 532.00           |

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| Manufacturer Name    | Model    | Description         | Acquisition Cost |
|----------------------|----------|---------------------|------------------|
| PRO-LOG              | M980-8   | PROGRAMMER, PROM    | 2,970.00         |
| CLAROSTAT            | 240C     | DECADE RESIST       | 99.00            |
| B & K INSTRUMENTS IN | 2426     | VOLTMETER AC        | 1,600.00         |
| TEKTRONIX            | 323      | OSCILLOSCOPE        | 1,354.50         |
| B & K                | 2426     | VOLTMETER           | 1,600.00         |
| DELL                 | TURBO    | MICRO COMPUTER      | 1,000.66         |
| B & K INSTRUMENTS IN | 2804     | POWER SUPPLY        | 962.00           |
| TEKTRONIX            | 7B53A    | PLUG-IN             | 1,249.67         |
| B & K INSTRUMENTS IN | 4160     | MICROPHONE          | 1,362.00         |
| BALLANTINE           | 300H     | VOLTMETER, AC       | 500.00           |
| PSI                  | 780B-02  | PRESS MEAS SYS      | 11,875.00        |
| FLUKE                | 52 K/J   | DIGITAL THERMOMETER | 189.00           |
| LEAR-SIEGLER         | ADM-11   | MONITOR/KEYBOARD    |                  |
| RUSKA                | 2413.5   | BARRIER             | 300.00           |
| BRUSH                | MARK 2   | RECORDER            | 1,495.00         |
| TEKTRONIX            | TM5006   | POWER SUPPLY M      | 1,090.00         |
| TEKTRONIX            | 3A75     | PLUG IN AMP         | 177.00           |
| GENRAD               | 1620A    | CAPACITOMETER       | 2,672.15         |
| SIMPSON              | 260      | VOM                 | 61.50            |
| B & K INSTRUMENTS IN | 4220     | SOUND LEVEL METER   | 1,029.00         |
| GENRAD               | W5MT3A   | VARIAC              | 339.00           |
| B & K INSTRUMENTS IN | 2804     | POWER SUPPLY        | 443.29           |
| B & K INSTRUMENTS IN | 2307A    | RECORDER            | 6,065.53         |
| WALLACE & TIERNAN    | FA129    | GAUGE               | 700.00           |
| MAX TECH             | PB64     | BUFFER PRINTER      | 99.00            |
| HEWLETT PACKARD      | 3455A    | DIG VOLTMETER       | 3,168.00         |
| GENRAD               | 1409-U   | STD. CAPACITOR      | 500.00           |
| B & K                | 4134     | MICROPHONE          | 900.00           |
| BELL & HOWELL        | SR 900   | MICRO READER        | 175.00           |
| PANASONIC            | FXRS506N | SCANNER             | 983.00           |
| UNITED SYSTEMS       | 311      | VOLT. CALIBRA       | 637.00           |
| STANDARD ELECTRIC    | S-1      | TIMER               | 111.00           |
| AIR CON              | 1220000  | CLEANING BENCH      | 1,200.00         |
| GENRAD               | 1490F    | DECADE INDUCT       | 635.00           |
| DAKE                 | 0        | DRAKE PRESS         | 85.00            |
| DATAMETRICS          | 1015S1L  | SIG. COND.          | 658.00           |
| SIMPSON              | 260      | V O M               | 50.00            |
| FLUKE                | 8062A    | MULTIMETER, DIG.    | 265.50           |
| SYSTRON DONNER       | 8120     | TIME CODE GEN       | 2,900.00         |
| SHALLCROSS           | 6863     | DECADE RESIST       | 267.00           |
| B & K INSTRUMENTS IN | 4134/S   | MICROPHONE          | 447.00           |
| VISUAL INFO          | 1208     | BAR DOTGENERAL      | 5,910.00         |
| KISTLER              | 303T     | ACCELEROMETER       | 750.00           |
| HEWLETT PACKARD      | 432A     | POWER METER         | 495.00           |
| GSE                  |          | LOCKER              | 41.40            |
| GSE                  |          | LOCKER              | 41.40            |
| L R                  | 95226    | PREC. CLEANER       | 160.00           |
| BELL & HOWELL        | 1-172    | GALVO AMP           | 875.00           |
| FLUKE                | 8800A    | VOLTMETER           | 1,151.32         |
| HEWLETT PACKARD      | 3455A    | DVM                 | 2,968.00         |
| KEITHLEY             | 5155     | MEGOHM STD          | 525.00           |
| TEKTRONIX            | K        | PLUG IN AMP         | 147.00           |

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| Manufacturer<br>Name | Model    | Description          | Acquisition<br>Cost |
|----------------------|----------|----------------------|---------------------|
| APPLE                | M5840    | COMPUTER             | 14,727.00           |
| TELEVIDEO            | 925      | KEYBOARD TERMINAL    | 100.00              |
| INTERNATIONAL BUSINE | 3192     | COMPUTER TERMINAL    | 74.00               |
| HI-TEK               | RT-101   | KEYBOARD             | 90.00               |
| MERIAM               | 34FB2    | MICROMANOMET         | 767.50              |
| VISIRECORD           | M        | CABINET              | 962.15              |
| HEWLETT PACKARD      | 4329A    | OHMMETER             | 752.85              |
| GENERAL ELECTRIC     | 7386-53  | STANDARD LAMP        | 50.00               |
| RFL                  | 2470350  | MAGNET CHARGER       | 1,002.75            |
| TEKTRONIX            | T922     | OSCILLOSCOPE         | 1,301.29            |
| FLUKE                | 77       | DIGITAL MULTIMETER   | 143.10              |
| KEPCO                | ATE36-8M | POWER SUPPLY         | 1,549.00            |
| B & K                | 2426     | VOLTMETER            | 1,600.00            |
| GRISWOLD             |          | DIVIDING HEAD        | 3,520.00            |
| NASA                 | NONE     | EQUIPMENT RACK       | 50.00               |
| MITUTOYO             | 0 THRU 6 | MICROMETER SET       |                     |
| RUSKA                | 6000-30  | MANOMETER            | 6,385.00            |
| BELL & HOWELL        | SPACE    | READER/PRINTER       | 1,139.00            |
| CONSOLIDATED CONTROL | 6201001  | PRESS STD.           | 2,554.90            |
| VIBROGRAF            | B200A    | RECORDER, TIME       | 1,865.00            |
| EG&G                 | 300      | HYGROMETER, DEWPOINT | 10,264.80           |
| B & K                | 5908     | METER, FREQUENCY     | 16,074.00           |
| TEKTRONIX            | A        | SCOPE CART           | 100.00              |
| GATEWAY              | 386/25   | COMPUTER             | 2,200.00            |
| CALZONE CASE         | NONE     | RUGGEDIZED CRT       | 2,494.00            |
| TEKTRONIX            | 335      | OSCILLOSCOPE         | 2,104.31            |
| SIMPSON              | 260      | VOM                  | 63.00               |
| SIMPSON              | 260      | V O M                | 63.00               |
| SIMPSON              | 260      | VOM                  | 63.00               |
| VIGOR                | BN225    | WATCHMAKE BENC       | 125.00              |
| DELL                 | 316LT    | COMPUTER             | 1,973.00            |
| GENERAL RESISTANCE   | DAS-46   | DIAL-A-SOURCE        | 875.00              |
| TEKTRONIX            | PG501    | PULSE GEN.           | 339.50              |
| VISHAY               | 1301     | DECADE RESIS         | 265.00              |
| TEKTRONIX            | DC503    | FREQ. METER          | 703.25              |
| EG&G                 | 880-C1   | HYGROMETER           | 1,905.00            |
| HEWLETT PACKARD      | 3439A    | VOLTMETER            | 950.00              |
| B & K                | 2619     | PRE-AMP              | 600.00              |
| RUSKA                | 6000-150 | MANOMETER, QUARTZ    | 8,445.00            |
| GATEWAY              | 386/25   | COMPUTER             | 2,200.00            |
| UNION CARBIDE        | LR50     | REFRIGERATOR         | 636.00              |
| AMCO ENGINEERING COR | SP25     | TORQUE WRENCH        | 12.00               |
| HEWLETT PACKARD      | 606B     | GENERATOR            | 1,562.16            |
| GENRAD               | 1304B    | OSCILLATOR           | 960.00              |
| FXR INC.             | N410A    | FREQ. METER          | 496.00              |
| IDEAL AEROSMITH      | 45133A   | THER WIR STRIP       | 35.00               |
| FLUKE                | 8842A    | VOLTMETER            | 909.15              |
| TEKTRONIX            | 7870     | TIME BASE            | 675.00              |
| TEKTRONIX            | 7A22     | AMPLIFIER, DIFFERENT | 610.00              |
| FLUKE                | 8842A    | VOLTMETER            | 909.15              |
| HEWLETT PACKARD      | 814B     | CARRIAGE SWR         | 1,050.49            |
| CLAROSTAT            | 240      | DECADE RESIST        | 70.00               |

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|----------------------|---------|----------------------|---------------------|
|                      |         | VACUUM BOTTLE        | 200.00              |
| HEWLETT PACKARD      | 5300B   | MEAS. SYSTEM         | 1,234.80            |
| B & K INSTRUMENTS IN | 4136    | MICROPHONE           | 717.25              |
| DATA PRECISION       | 2540A1  | DIGITAL VOM          | 1,299.80            |
| GENRAD               | 1419A   | DECADE CAP           | 180.00              |
| SIMPSON              | 260     | MULTIMETER           | 50.00               |
| B & K INSTRUMENTS IN | 2426    | VOLTMETER AC         | 1,600.00            |
| HYDOR THERME         | 460     | OVEN                 | 125.00              |
| GENERAL RESISTANCE   | DAS86   | POWER SUPPLY         | 1,442.75            |
| KEITHLEY             | 5155    | MEGOHM STD           | 525.00              |
| DATA PRECISION       | 245     | DIG MULTIMETER       | 280.25              |
| B & K                | 4134    | MICROPHONE           | 900.00              |
| B & K                | 4134    | MICROPHONE           | 900.00              |
| GENERAL ELECTRIC     | 7387-33 | STANDARD LAMP        | 50.00               |
| B & K INSTRUMENTS IN | 2804    | POWER SUPPLY         | 962.00              |
| B & K INSTRUMENTS IN | 2639    | PREAMPLIFIERS        | 887.00              |
| EPSON                | FX86E   | PRINTER, DIGITAL     | 386.00              |
| PSI                  | 780B    | PRESS. SYSTEM        | 4,750.00            |
| HEWLETT PACKARD      | 5300A   | COUNTER              | 1,183.05            |
| FLUKE                | 77      | DIGITAL MULTIMETER   | 107.10              |
| GENRAD               | W5MT3   | VARIAC               | 95.00               |
| TEKTRONIX            | 5B31    | PREAMP               | 602.00              |
| NASA                 | NONE    | OPTICAL BENCH        | 573.00              |
| GENRAD               | 900LB   | SOLTTED LINE         | 2,890.00            |
| HEWLETT PACKARD      | 9830A   | ELEC CALCULATO       | 8,251.60            |
| MAX TECH             | PB64    | BUFFER PRINTER       | 99.00               |
| MAX TECH             | PB64    | BUFFER PRINTER       | 99.00               |
| TALYVEL              | 705     | ELECT LEVEL          | 1,400.00            |
| GUILDLINE            | 9152/4  | CALIB. STD.          | 1,622.00            |
| OREGON               | A3      | POWER SUPPLY         | 179.23              |
| RING KING            | AC0080  | ACOUSTIC ENCLO       | 99.95               |
| RING KING            | AC0080  | ACOUSTIC ENCLO       | 99.95               |
| APPLE                | M0115   | KEYBOARD             | 165.00              |
| KEITHLEY             | 261     | CURRENT SOURCE       | 628.89              |
| PACKARD BELL         | 1200    | MODEM                | 89.00               |
| CONSOLIDATED CONTROL | 6201    | PRESS STD.           | 2,450.00            |
| HEWLETT PACKARD      | 651A    | TEST OSCILLAT        | 590.00              |
| KEPCO                | SM1602M | POWER SUPPLY         | 700.50              |
| ODELL                | 12      | CLEANER              | 1,665.85            |
| HEWLETT PACKARD      | 5255A   | FREQ. CONVERTER      | 2,200.00            |
| WEATHERTRONICS       | 5021    | HYGROTHERMOGRA       | 365.00              |
| COHERENT             | 203     | POWER METER, LASER   | 1,950.00            |
| FLUKE                | 77      | DIGITAL MULTIMETER   | 143.10              |
| FLUKE                | 77      | DIGITAL MULTIMETER   | 143.10              |
| TEKTRONIX            | 3B4     | TIME BASE            | 495.00              |
| HEWLETT-PACKARD      | 8904A   | WHITE NOISE GENERATO | 2,759.00            |
| COMPUADD             | 286     | COMPUTER             | 1,583.00            |
| COMPUADD             | 286     | MICRO COMPUTER       | 1,128.00            |
| TEKTRONIX            | 1106    | BATTERY PACK         | 275.00              |
| PRECISION SCIENTIFIC | 104     | OVEN                 | 260.00              |
| GARDNER              | 14R2    | WIRE WRAP GUN        | 150.00              |
| HONEYWELL            | 1858    | OSCILLOGRAPH         | 16,000.00           |



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| Manufacturer Name    | Model     | Description          | Acquisition Cost |
|----------------------|-----------|----------------------|------------------|
| TEKTRONIX            | SC504     | OSCILLOSCOPE         | 1,838.00         |
| SETRA SYSTEM         | 270       | TRANSDUCER           | 850.00           |
| WILSON LABS          | DX-500    | EXERCISER            | 1,695.00         |
| FUJITSU              | FKB2930   | KEYBOARD, COMPUTER   | 99.00            |
| STANDARD             | MCH-4095N | MONITOR              | 470.00           |
| GENRAD               | 1409-F    | STD. CAPACITOR       | 85.00            |
| RUSKA                | DDR6000   | QUARTZ PRESSURE GAGE | 1,283.00         |
| STANDARD             | MCH-4095N | MONITOR              | 470.00           |
| SWIVELIER            | 32        | SWIVEL LAMP          | 10.35            |
| MICRODOT             | F321A     | OSCILLATOR SIN       | 544.75           |
| TEKTRONIX            | DM501     | DIG MULTIMETER       | 459.56           |
| HEWLETT PACKARD      | 200CD     | AUDIO SIG GEN        | 282.49           |
| HEWLETT PACKARD      | 5253B     | CONVERTER            | 400.00           |
| WELCH                | 1402      | VAC PUMP             | 342.50           |
| SIMPSON              | 260       | MULTIMETER           | 50.00            |
| L & N                | 4045B     | STD. RESIST.         | 75.00            |
| L & N                | 4214B     | RESISTOR             | 2,327.00         |
| HEWLETT PACKARD      | 200CD     | AUDIO SIG GEN        | 282.49           |
| AMPEX                | AA620     | AMP SPEAKER          | 240.00           |
| CRAFTSMAN            | 965726N   | TOOL CHEST           | .00              |
| B & K                | 2639      | PRE AMP              | 593.00           |
| TEKTRONIX            | D         | PRE AMP              | 155.00           |
| IBM                  | 5150      | COMPUTER W/KEYBOARD  |                  |
| HEWLETT PACKARD      | 203A      | AUDIO SIG GEN        | 1,259.24         |
| HEWLETT PACKARD      | 7245A     | PRINTER/PLOT.        | 169.00           |
| MCM ELECTRON         | 72-040    | CAPACITOMETER        | 59.80            |
| HEWLETT PACKARD      | 98561     | COMPUTER, DIGITAL    | 2,856.00         |
| GENRAD               | 1409T     | STD CAP              | 70.00            |
| KEITHLEY             | 130A      | DIG MULTIMETER       | 113.90           |
| GENRAD               | W5MT3A    | VARIAC               | 95.00            |
| HEWLETT-PACKARD      | 3458A     | MULTIMETER           | 5,687.00         |
| IBM                  | 5161      | EXTENDER             | 5,687.00         |
| BLACK BOX            | TS286B    | INTERFACE TEST SET,  | 229.00           |
| FUJITSU              | FKB2930   | KEYBOARD, COMPUTER   | 99.00            |
| KEITHLEY             | 130A      | DIG MULTIMETER       | 113.90           |
| FLUKE                | 52 K/J    | DIGITAL THERMOMETER  | 169.00           |
| TELEDYNE HASTINGS    | VT-6B     | VACUUM GAGE          | 318.00           |
| TELEDYNE HASTINGS    | VT-6B     | VACUUM GAGE          | 318.00           |
| NICOLET              | 764       | LOGIC ANALYZER       | 18,456.50        |
| HEWLETT PACKARD      | 400EL     | VOLTMETER AC         | 327.45           |
| TEKTRONIX            | 520A      | VECTORSCOPE          | 3,104.00         |
| WHITE INSTRUMENTS    | 2640      | TEST SET             | 625.00           |
| HEWLETT PACKARD      | 6255A     | DC PWR. SUP.         | 641.50           |
| HEWLETT PACKARD      | 35        | CALCULATOR           | 387.10           |
| VOLUMETRICS          | V-1R      | CONTROLLER           | 250.00           |
| SPECTRAL DYNAMICS    | SD112-1   | VOLTMETER            | 3,234.00         |
| TEKTRONIX            | 1470      | TV GENERATOR         | 2,600.00         |
| NASA                 | NONE      | CAL.SYSTEM PAD       | 3,000.00         |
| BLACK & DECKER       | 582-6     | SABER SAW            | 94.00            |
| PLANTRONICS          | HSB552-1  | HEAD PHONES          | 113.33           |
| HELICOIL             | 6-32      | HELICOIL SET         | 23.90            |
| ULTIMATE COMPUTER SU | NONE      | MICROMANAGER WORKSTA | 130.55           |

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|----------------------|-----------|----------------------|---------------------|
| HEIDENHAIN           | VRZ460    | READOUT              |                     |
| B & K INSTRUMENTS IN | 2804      | POWER SUPPLY         | 160.00              |
| TEKTRONIX            | 834       | DATA TEST SET        | 3,990.00            |
| SYSTRON DONNER       | 8120      | TIME CODE GEN        | 2,900.00            |
| EDC CORPORATION      | MV100     | VOLT. STANDARD       | 850.00              |
| NSK                  | 1 INCH    | CALIPER MIKE         | 20.00               |
| WEINSCHEL            | BA-5      | ATTEN. CALIBRA       | 497.50              |
| CHADWICK HELMUTH     | 201       | SWEEP-SYNC           | 1,000.00            |
| HEWLETT-PACKARD      | 3314A     | FUNCTION GENERATOR   | 4,915.00            |
| WELCH                | 8810      | VACUUM PUMP          | 600.00              |
| HEWLETT PACKARD      | 721A      | POWER SUPPLY         | 147.75              |
| HEWLETT PACKARD      | 3443A     | PLUG-IN              | 525.00              |
| ATLANTIC RESEARCH    | DPS-3-1MF | DATA SWITCH NETWORK  | 1,450.00            |
| HEWLETT PACKARD      | 400E      | AC VOLTMETER         | 287.12              |
| POWER MATE           | BP20E     | POWER SUPPLY         | 218.25              |
| ASTROSYSTEMS         | A1202     | RESOL STANDARD       | 1,181.00            |
| B & K INSTRUMENTS IN | 4134S     | MICROPHONE           | 300.00              |
| GUILDLINE            | 9700PL    | VOLT BOX             | 618.00              |
| ULTIMATE COMPUTER SU | NONE      | MICROMANAGER WORKSTA | 130.55              |
| SORENSEN             | FR1000    | VOLTAGE REG.         | 1,431.00            |
| B & K INSTRUMENTS IN | 4132      | MICROPHONE           | 250.00              |
| SIMPSON              | 461-2     | MULTIMETER           | 152.00              |
| B & K                | 2619      | PRE-AMP              | 600.00              |
| DATATRON             | DT-4      | INTERFACE TEST SET   | 239.00              |
| TEKTRONIX            | 191       | SIGNAL GEN           | 674.15              |
| UNHOLTZ DICKIE       | 1611      | STANDARDIZER, CALIBR | 1,455.00            |
| TELEDYNE             | CPR-HFC   | CALIBRATION BOX      | 395.00              |
| GENRAD               | 1403D     | STD. CAP.            | 80.00               |
| HEWLETT PACKARD      | 203A      | GENE AUDIO SIG       | 1,876.05            |
| SMITH MFG            | SM02805   | PRINTER STAND        | 107.50              |
| HEWLETT PACKARD      | 9876A     | PRINTER              | 4,740.00            |
| SYSTRON DONNER       | 8120      | TIME CODE GENERATOR  | 2,900.00            |
| HEWLETT PACKARD      | 467A      | POWER AMP RACK       | 248.00              |
| FLUKE                | 8810A     | DIG MULTIMETER       | 1,218.10            |
| FLUKE                | 8810      | DIG. MULTIMETER      | 1,100.00            |
| B & K INSTRUMENTS IN | 2804      | POWER SUPPLY         | 988.95              |
| MKS                  | 77        | PRESSURE METER       | 2,012.00            |
| L & N                | 4959      | CONDUCTIVE BR        | 1,067.80            |
| KEITHLEY             | 130       | DMM                  | 115.00              |
| L & N                | 4210-B    | STD RESISTOR         | 1,100.00            |
| PACIFIC MEASUREMENTS | 1038      | OSCILLOSCOPE         | 6,242.00            |
| RUSKA                | 2417705   | PRESSURE CELL        | .00                 |
| M & G                | T-150     | DEAD WEIGHT          | 1,363.00            |
| LAMINAR FLOW         |           | CLEAN BENCH          | 1,172.00            |
| SHALLCROSS           | 6860      | RESISTANCE BOX       | 135.00              |
| L & N                | 4030B     | STD. RESISTOR        | 150.00              |
| TRIPLETT             | 310       | VOLT OHM METER       | 69.00               |
| B & K                | 2619      | PRE-AMP              | 600.00              |
| B & K                | 4145      | MICROPHONE           | 900.00              |
| B & K INSTRUMENTS IN | 2619      | PREAMPLIFIER         | 250.00              |
| B & K INSTRUMENTS IN | 2619      | PREAMPLIFIER         | 250.00              |
| BEHAVIOR TECH COMPUT | BTC5060   | KEYBOARD, PC         | 150.00              |

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| Manufacturer Name    | Model      | Description          | Acquisition Cost |
|----------------------|------------|----------------------|------------------|
| EPSON                | P70RA      | PRINTER              | 200.00           |
| HEWLETT-PACKARD      | 5245L      | COUNTER              | 2,480.00         |
| FLUKE                | 8842A      | DIGITAL MULTIMETER   | 1,395.00         |
| BERGER               | 10FT       | SURVEY ROD           | 30.00            |
| TEKTRONIX            | 455        | OSCILLOSCOPE         | 1,688.29         |
| MOTOROLA             | H99SS+008H | TRANSCEIVER, RADIO   | 1,974.41         |
| GERTSCH              | 1011       | VOLT DIVIDER         | 550.00           |
| GENRAD               | W5MT3A     | VARIAC               | 95.00            |
| B & K                | 4134       | MICROPHONE           | 908.00           |
| B & K INSTRUMENTS IN | 2804       | POWER SUPPLY         | 160.00           |
| INLAND               | 823        | RATE TABLE           | 22,396.00        |
| HEWLETT PACKARD      | 5300A      | COUNTER SYSTEM       | 391.05           |
| FLUKE                | 77         | DIG MULTIMETER       | 129.00           |
| AUTO SPERRY          | 550660P    | TRANSDUCER           | 695.00           |
| YELLOW SPRINGS INSTR | M-17669    | TIN FREEZE PT        | 4,000.00         |
| TEKTRONIX            | 0670521    | PLUG IN              | 325.00           |
| AINSWORTH            | CLASS S    | WEIGHTS              | 200.00           |
| KEITHLEY             | 261        | PICOAMMETER          | 498.82           |
| GATEWAY              | 2189       | KEYBOARD             | 100.00           |
| HEWLETT PACKARD      | 9876A      | PRINTER THERM        | 3,578.33         |
| TEKTRONIX            | 013013     | EXTENDER BOARD       | 20.00            |
| BALDRID              |            | LAP PLATE KIT        | 100.00           |
| HEWLETT PACKARD      | 310A       | ANALYZER             | 2,200.00         |
| B & K INSTRUMENTS IN | 4134       | MICROPHONE           | 210.00           |
| SIMPSON              | 260        | VOM                  | 58.96            |
| ALLOY COMPUTER       |            | TAPE DRIVE, CARTRIDG | 750.00           |
| EPSON                | FX1050     | PRINTER, DIGITAL     | 471.00           |
| MENSOR               | 11900      | PRESS.INDICA.        | 2,489.00         |
| ROSEMOUNT            | 914C2      | TEMP BATH            | 14,000.00        |
| TEKTRONIX            | TM503      | POWER MODULE         | 500.00           |
| B & K INSTRUMENTS IN | 4133/S     | MICROPHONE           | 447.00           |
| TEXAS INSTRUMENTS    | 59         | CALCULATOR           | 260.95           |
| B & K INSTRUMENTS IN | 2619S      | MICRO. PREAMP        | 458.00           |
| SENSITIVE RESEARCH   | ESD        | VOLTMETER            | 275.00           |
| SYSTRON DONNER       | 8140       | TAPE SEARCH UT       | 2,085.50         |
| RACAL DANA           | 9478       | FREQUENCY STANDARD   | 1,872.00         |
| HEWLETT PACKARD      | 8011A      | PULSE GEN.           | 519.75           |
| GENRAD               | 874G20     | G20 ATTENUATOR       | 30.00            |
| MOTOROLA             | 01-P02690N | RADAR TRANCEIVER     | 15,780.00        |
| WEINSCHEL            | 430A       | OSCILLATOR           | 2,200.00         |
| B & K INSTRUMENTS IN | 4134S      | MICROPHONE           | 300.00           |
| FLUKE                | 8800A      | MULTIMETER           | 955.45           |
| WEINSCHEL            | H0-1       | MIXER OSCILAT.       | 11,200.00        |
| KEITHLEY             | 130        | DMM                  | 115.00           |
| KEITHLEY             | 130        | DMM                  | 115.00           |
| TELEX                | CS-75      | HEADPHONES           | 100.00           |
| IKEGAMI              | C/DM201A   | MONITOR              | 2,438.00         |
| HEWLETT PACKARD      | 7570A      | GRAPHICS PLOTTER     | 2,924.00         |
| B & K INSTRUMENTS IN | 2619/S     | PREAMPLIFIER         | 250.00           |
| HEWLETT PACKARD      | 5302A      | COUNTER MODULE       | 700.00           |
| FLUKE                | 77         | DIGITAL MULTIMETER   | 138.00           |
| KEITHLEY             | 194A       | DIGITAL VOLTMETER    | 5,846.00         |

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| Manufacturer Name    | Model      | Description          | Acquistion Cost |
|----------------------|------------|----------------------|-----------------|
| DATAMETRICS          | 699        | POWER SUPPLY         | 1,100.00        |
| FLUKE                | 77         | DIGITAL MULTIMETER   | 138.00          |
| DUNKLEBERGER         | 236        | RESIST SUB BOX       | 20.00           |
| GENRAD               | 1925       | MULTIFILTER          | 3,849.60        |
| KINEMETRICS          | 4688C      | DIGITAL CLOCK        | 3,963.00        |
| WYSE                 | WY-60      | TERMINAL             | 294.00          |
| EVEREX               | 24E        | MODEM                | 198.00          |
| GATEWAY              | PMV14VC    | MONITOR              | 500.00          |
| HEWLETT PACKARD      | 425A       | VOLT AMMETER         | 512.40          |
| ADRET                | 201        | GENERATOR            | 4,326.20        |
| B & K INSTRUMENTS IN | 2639       | PREAMPLIFIERS        | 887.00          |
| TEKTRONIX            | 53/54B     | PRE AMPLIFIER        | 125.00          |
| HEWLETT PACKARD      | 5302A      | COUNTER PLUGON       | 272.25          |
| IWATSU               | SS-5711D   | OSCILLOSCOPE         | 1,749.62        |
| ROSEMOUNT            | 162D       | TEMPERATURE STANDARD | 893.60          |
| GENRAD               | 722D       | CONDENSER            | 207.85          |
| B & K                | 2619       | PRE-AMP              | 600.00          |
| B & K                | 4145       | MICROPHONE           | 900.00          |
| DIGITAL EQUIPMENT CO | II         | TERMINAL             | 1,517.00        |
| FLUKE                | 87         | DIGITAL MULTIMETER   | 252.00          |
| MERIAM               | A646       | BELLOWS              | 60.00           |
| GENRAD               | 874G20     | G20 ATTENUATOR       | 30.00           |
| HEWLETT-PACKARD      | 2623A      | MONITOR/KEYBOARD     |                 |
| HEWLETT PACKARD      | 59301A     | CONVERTER            | 569.25          |
| DODGE                | KARYVAN    | TRUCK                | 8,040.00        |
| GENRAD               | 1433W      | DECADE RESIST        | 176.50          |
| GENRAD               | 1409-R     | STD. CAPACITOR       | 85.00           |
| HONEYWELL            | 1858       | VISICORDER           | 6,905.00        |
| GENRAD               | 1482P      | STD INDUCTOR         | 150.00          |
| SMITH MFG            | SM02805    | PRINTER STAND        | 107.50          |
| PAROSCIENTIFIC       | 600        | PRESS.MEAS SYS       | 1,848.00        |
| B & K INSTRUMENTS IN | 2804       | POWER SUPPLY         | 962.00          |
| B & K INSTRUMENTS IN | 2804       | POWER SUPPLY         | 962.00          |
| TEKTRONIX            | K          | PRE AMP              | 135.00          |
| TEKTRONIX            | 7A13       | PLUG IN              | 1,922.00        |
| TEKTRONIX            | PG506      | SQUARE WAVEGEN       | 1,636.00        |
| HEWLETT PACKARD      | 3590A      | ANALYZER, WAVE       | 3,280.00        |
| SCHLUMBERGER/FACTRON | 136180 [63 | TESTER, CIRCUITBOARD | 47,350.00       |
| KISTLER              | 303B       | ACCELEROMETER        | 551.50          |
| HEWLETT PACKARD      | 865B       | POWER SUPPLY         | 169.00          |
| IWATSU               | SS-5711D   | OSCILLOSCOPE         | 1,749.62        |
| FLUKE                | 8020B      | DIGITAL MULTIMETER   | 186.79          |
| BURGESS              | 13U8053    | VIBRO TOOL KIT       | 14.95           |
| PACKARD BELL         | 1200       | MODEM                | 89.00           |
| HEWLETT PACKARD      | 8485A      | SENSOR               | 850.50          |
| FLUKE                | 23         | DIGITAL MULTIMETER   | 143.10          |
| FLUKE                | 77         | MULTIMETER           | 130.00          |
| OPAD                 | KM870      | POWER SUPPLY         | 206.00          |
| B & K INSTRUMENTS IN | 2606       | AMPLIFIER            | 1,168.14        |
| SIMPSON              | 260        | MULTIMETER           | 50.00           |
| B & K INSTRUMENTS IN | 4220       | PISTONPHONE          | 245.86          |
| HEWLETT PACKARD      | 3456A      | DIGITALVOLTMR        | 3,552.00        |

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|----------------------|------------|----------------------|------------------|
| HEWLETT PACKARD      | 3561A      | ANALYZER SPECTRUM    | 11,387.25        |
| FIRTH                | 61-7700    | ONE CYL CART         | 21.50            |
| HAZELTINE            | 4DTD155207 | MONITOR              |                  |
| BALDOR               | 111        | GRINDER-BUFFER       | 58.00            |
| SIMPSON              | 260        | VOM                  | 54.00            |
| WELCH                | 8814A      | VACUUM PUMP          | 1,149.00         |
| PLANTRONICS          | HSB552-1   | HEAD PHONES          | 113.33           |
| HEWLETT PACKARD      | 9866A      | PRINTER              | 3,957.00         |
| HEWLETT PACKARD      | 5300A      | FREQ COUNTER         | 391.05           |
| B & K INSTRUMENTS IN | 4220       | PISTONPHONE          | 850.00           |
| HEWLETT PACKARD      | 8616A      | SIG. GENERATOR       | 2,100.00         |
| AVIV CORP.           | 3910       | TAPE DRIVE, MAGNETIC | 8,000.00         |
| CYBERNETIC           | D210E-51   | EMULATOR             | 1,800.00         |
| TEKTRONIX            | 575        | TRANS TRACER         | 1,337.00         |
| PC'S LIMITED         | AT110      | COMPUTER, PERSONAL   | 1,200.00         |
| CRAFTSMAN            | 7830       | VACUUM CLEANER       | 105.00           |
| GENRAD               | 1304B      | OSCILLATOR           | 960.00           |
| RUSKA                | 6005-20    | INTERFACE            | 3,744.00         |
| B & K                | 2639       | PRE AMP              | 593.00           |
| B & K                | 2639       | PRE AMP              | 593.00           |
| B & K INSTRUMENTS IN | 2619       | PREAMPLIFIER         | 442.00           |
| SHALLCROSS           | 6860       | PREC RES DEC         | 135.00           |
| BAUSCH-LOMB          | BVD-73     | MICROSCOPE           | 419.00           |
| TEKTRONIX            | 7603       | OSCILLOSCOPE         | 2,186.55         |
| KEITHLEY             | 220        | CURRENT SOURCE       | 3,067.20         |
| CEL INSTRUMENTS      | 213        | NOISE GENERATOR      | 611.13           |
| MAX TECH             | PB64       | BUFFER               | 89.00            |
| EPSON                | FX286E     | PRINTER              | 530.00           |
| ONAN                 | 3-0AJ-1    | GENERATOR            | 610.20           |
| GENRAD               | 1454A      | DEC VOLT DIV         | 162.89           |
| RUSKA                | 2416704    | PRES INDICATOR       | 2,285.00         |
| HEWLETT PACKARD      | 5328A      | COUNTER              | 1,633.50         |
| GATEWAY              | 386/25     | COMPUTER             | 1,770.00         |
| COOKE                | 25MM       | LENS                 | 40.00            |
| COMPUADD             | 286        | MICRO COMPUTER       | 1,128.00         |
| PC'S LIMITED         | AT110      | COMPUTER, PERSONAL   | 1,200.00         |
| HICKOK               | 539C       | TUBE TESTER          | 378.00           |
| SIMPSON              | 260        | VOM                  | 63.00            |
| HEWLETT PACKARD      | 3320B      | GENERATOR            | 3,311.55         |
| APPLE                | A9M0370    | PRINTER              | 393.00           |
| NEFF                 | 122-223    | AMPLIFIER            | 916.65           |
| HEWLETT PACKARD      | 3495A      | RELAY SCANNER        | 2,821.50         |
| ELGENCO INC.         | 610A       | GENERATOR            | 1,969.08         |
| COMPUADD             | 286        | COMPUTER             | 1,583.00         |
| TEKTRONIX            | 561A       | OSCILLOSCOPE         | 500.00           |
| HEWLETT PACKARD      | 35         | CALCULATOR           | 387.10           |
| HEWLETT PACKARD      | 8011A      | GENERATOR            | 792.00           |
| TEKTRONIX            | 7904       | OSCILLOSCOPE         | 3,977.00         |
| L & W                | 4045B      | STD RESISTOR         | 150.00           |
| DELTA DESIGN         | 9023/9010  | TEST CHAMBER, TEMP   | 4,035.00         |
| FLUKE                | 415A       | POWER SUPPLY         | 508.00           |
| TEKTRONIX            | 475        | OSCILLOSCOPE         | 2,822.70         |

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| Manufacturer<br>Name | Model      | Description          | Acquisition<br>Cost |
|----------------------|------------|----------------------|---------------------|
| IBM                  | 5150       | COMPUTER W/KEYBOARD  |                     |
| WELCH                | 8915A      | PUMP, VACUUM         | 1,412.79            |
| UNHOLTZ DICKIE       | CC350      | AMPLIFIER            | 3,500.00            |
| DUNKLEBERGER         | 236        | RESIST SUB BOX       | 20.00               |
| VOLUMETRICS          | V-1R       | PRES. BELLOWS        | 535.00              |
| FLUKE                | 5205A      | PWR AMPLIFIER        | 7,881.90            |
| TEKTRONIX            | 561A       | OSCILLOSCOPE         | 550.00              |
| HEWLETT PACKARD      | 5334A      | FREQ. COUNTER        | 4,142.00            |
| WELCH                | 1402B      | VAC PUMP             | 405.00              |
| INTERNATIONAL BUSINE | 5150174    | COMPUTER             | 1,843.00            |
| MITSUMI              | KPQ-E994C  | KEYBOARD             | 98.00               |
| COMPUADD             | 51086      | MONITOR              | 400.00              |
| NICOLET              | 1090A      | SCOPE                | 6,547.20            |
| FLUKE                | 77         | MULTIMETER, DIG.     | 116.10              |
| HEWLETT PACKARD      | 5265A      | VOLTMETER            | 816.75              |
| B & K                | 2619       | PRE-AMP              | 600.00              |
| MAXI SWITCH          | 2186079    | KEYBOARD             | 85.00               |
| INNOVENTIONS INC     | RAM CHECK  | SIM CHECK            | 895.00              |
| DATAMETRICS          | 1018B      | MANOMETER SYST       | 2,185.00            |
| APPLE                | M3501      | KEYBOARD             | .00                 |
| HEWLETT-PACKARD      | 7440A      | PRINTER/PLOTTER      | 854.70              |
| B & K                | 4134       | MICROPHONE           | 900.00              |
| RUSKA                | 2465-752   | AIR PISTON GAUGE BAS | 5,600.00            |
| SOLA                 | 28510      | POWER SUPPLY         | 330.00              |
| REGAL                | NONE       | TAP & DIE KIT        | 188.00              |
| DUNKLEBERGER         | 236        | RESIST SUB BOX       | 20.00               |
| HEWLETT PACKARD      | 400E       | VOLTMETER            | 440.00              |
| DAYTON               | 3Z528      | AIR DRYER            | 446.21              |
| SIMPSON              | 261        | VO MILLIAMMETR       | 68.40               |
| NEFF                 | 018-17     | AMP. RACK            | 3,695.70            |
| SIMPSON              | 461-2      | MULTIMETER           | 152.00              |
| PHOTOCON             | PC120      | MICROPHONE CAL       | 235.00              |
| HEWLETT PACKARD      | 8443A/8443 | TRACKING GENERATOR   | 200.00              |
| GENRAD               | 1482-C     | STD. INDUCTOR        | 110.00              |
| IBM                  | 5151       | MONITOR              | 5,238.00            |
| TEKTRONIX            | 3T77A      | PLUG-IN              | 691.41              |
| GENRAD               | 1455BH     | VOLT DIVIDER         | 280.00              |
| TEKTRONIX            | K          | PLUG IN              | 180.00              |
| FLUKE                | 931B       | TRUE RMS VOLT        | 1,256.15            |
| B & K INSTRUMENTS IN | 2639       | PREAMPLIFIERS        | 887.00              |
| GENRAD               | 1482E      | STD. INDUCR.         | 175.00              |
| MCLEAN               | 2E300A     | BLOWER               | 50.00               |
| HI-TEC               | RT101      | KEYBOARD             | 85.00               |
| PACE INC             | PRC351     | PCB REPAIR STATION   | 3,154.00            |
| TEKTRONIX            | SG503      | SIGNAL GENERAT       | 582.00              |
| HEWLETT PACKARD      | 4329A      | MEGOHMMETER          | 1,633.58            |
| HEWLETT PACKARD      | 721A       | POWER SUPPLY         | 149.60              |
| FLUKE                | 8020A      | DIG MULTIMTR         | 182.00              |
| KAYE INSTRUMENTS     | K140-4     | ICE POINT REF        | 515.00              |
| HEWLETT PACKARD      | 3458A      | DIGITAL MULTIMETER   | 6,311.40            |
| HOUSTON              | DMP-61     | PLOTTER GRAPHICS     | 3,264.00            |
| TEKTRONIX            | 7A22       | PLUG IN              | 1,762.25            |

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| Manufacturer Name    | Model      | Description          | Acquisition Cost |
|----------------------|------------|----------------------|------------------|
| AMDEK                | 303        | MONITOR              | 150.00           |
| GSE                  |            | LOCKER               | 41.40            |
| SHARP                | EL-5500 II | COMPUTER, SCIENTIFIC | 70.00            |
| SIMPSON              | 260        | V O M                | 54.00            |
| ENDEVCO              | 2224C      | ACCELEROMETER        | 200.00           |
| WEATHERTRONICS       | 5021       | HYGROTHERMOGRA       | 365.00           |
| B & K                | 2639       | PREAMP               | 593.00           |
| MOTOROLA             | 01-P200014 | SIGNAL PROCESSOR     | 24,488.00        |
| EPSON                | FX850      | PRINTER              | 549.00           |
| TEKTRONIX            | 211        | OSCILLOSCOPE         | 528.65           |
| TEKTRONIX            | 5A15N      | PREAMP.              | 126.10           |
| MKS                  | 2156       | PWR. SUP.            | 690.00           |
| NC                   | C6800      | COLLIMATER           | 575.00           |
| SENCORE              | TR193B     | TRANISTOR TEST       | 72.98            |
| TEKTRONIX            | 475        | OSCILLOSCOPE         | 2,822.70         |
| IBM                  | 5151       | MONITOR              |                  |
| FLUKE                | 332-A      | VOLT. STANDARD       | 2,307.77         |
| FLUKE                | -8086      | INTERFACE            | 2,495.00         |
| GENRAD               | 1311A      | AUDIO OSCILLA.       | 382.89           |
| NARDA                | 802B       | FREQ. METER          | 788.00           |
| HEWLETT PACKARD      | 8481       | POWER SENSOR         | 728.59           |
| INTERNATIONAL BUSINE | 3192       | COMPUTER TERMINAL    | 747.00           |
| B & K INSTRUMENTS IN | 4142       | MICROPHONE CAL       | 543.25           |
| HEWLETT PACKARD      | 6205B      | POWER SUPPLY         | 514.80           |
| B & K                | 4134       | MICROPHONE           | 908.00           |
| VEECO                | SC-4       | STANDARD CALIBRATOR  | 745.00           |
| INTERLAN             | MPR110V    | MULTPORT REPEATER, L | 1,798.00         |
| KROHN-HITE           | 4200       | OSCILLATOR           | 600.00           |
| TEKTRONIX            | 190A       | CONST AMP GEN        | 330.00           |
| HEWLETT PACKARD      | 608C       | VHF SIG GEN          | 1,220.00         |
| FLUKE                | 332D       | POWER SUPPLY         | 2,935.10         |
| B & K INSTRUMENTS IN | 2804       | POWER SUPPLY         | 160.00           |
| B & K INSTRUMENTS IN | 4134       | MICROPHONE           | 250.00           |
| HASTINGS             | VT-5       | VACUUM GAUGE         | 285.00           |
| HEWLETT PACKARD      | 3478A      | DIG MULTIMETER       | 1,248.00         |
| HEWLETT PACKARD      | 5328A      | FREQ. COUNTER        | 2,468.00         |
| KINEMATRICS          | 468-DC     | CLOCK, DIGITAL       | 3,939.00         |
| TEKTRONIX            | 475        | OSCILLOSCOPE         | 2,813.00         |
| FLUKE                | 408A       | POWER SUPPLY         | 665.00           |
| REALISTIC            | TRC-83     | TRANSCEIVER          | 39.95            |
| MOTOROLA             | H99SS+008H | TRANSCEIVER, RADIO   | 1,974.71         |
| FLUKE                | 5205A      | POWER AMPLIF         | 3,390.15         |
| VOLUMETRICS          | VIR        | CONTROLLER           | 400.00           |
| PRECISION FILTERS    | MF32-00-01 | FILTERS              | 21,350.00        |
| TEKTRONIX            | 834        | DATA TEST SET        | 2,232.00         |
| DATAMETRICS          | 1174       | MANOMETER            | 1,553.25         |
| MENSOR               | 11900      | PRESSINDICATOR       | 2,780.00         |
| SIMPSON              | 260        | VOM                  | 61.65            |
| B & K INSTRUMENTS IN | 4134       | MICROPHONE           | 210.00           |
| B & K                | 2619       | PRE-AMP              | 600.00           |
| B & K                | 4133       | MICROPHONE           | 900.00           |
| FLUKE                | 3010A      | TESTER               | 14,356.24        |

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|----------------------|---------|----------------------|---------------------|
| DATAPULSE            | 110B    | PULSE GEN            | 1,212.50            |
| DATAMETRICS          | 1015D5C | SIG CONDITONE        | 1,296.75            |
| HONEYWELL            | 101     | TAPE RECORDER        | 21,061.00           |
| RONAN-KUNZEL INC.    | 150.5   | TANK TRAILER         | 3,770.00            |
| B & K INSTRUMENTS IN | 2426    | VOLTMETER AC         | 1,600.00            |
| L & N                | 4025B   | STD RESISTOR         | 150.00              |
| HONEYWELL            | 1858    | CHART RECORDER, FIBE | 19,575.00           |
| B & K INSTRUMENTS IN | 4145    | MICROPHONE           | 883.00              |
| HEWLETT PACKARD      | 3325B   | SYNTHESIZER, FREQUEN | 4,563.99            |
| GENRAD               | W5MT3A  | VARIAC               | 95.00               |
| HOKE                 | NONE    | GAGE BLOCKS          | 98.50               |
| FLOW DYNE            | ET16008 | FLOW STRAIGHTN       | 75.00               |
| FLUKE                | 2176A   | THERMOMETER          | 617.50              |
| GENRAD               | 15620   | SOUND-LEV CAL        | 195.00              |
| B & K INSTRUMENTS IN | 4165    | MICROPHONE           | 554.00              |
| B & K                | 4134    | MICROPHONE           | 900.00              |
| NEFF                 | 122-8   | AMPLIFIER            | 650.00              |
| STARRETT             | 199     | PRECISION LEVEL      | 95.00               |
| HEWLETT PACKARD      | 202C    | LO FREQ OSCILL       | 1,800.00            |
| GENRAD               | 1304B   | BEAT FREQ OSC        | 960.00              |
| FLUKE                | 8000A   | DIG MULTIMETER       | 290.03              |
| HEWLETT PACKARD      | 1600A   | ANALYZER             | 5,112.90            |
| DATA PRECISION       | 245     | DIG MULTIMETER       | 280.25              |
| TEKTRONIX            | 7B53A   | PLUG-IN DUAL TIME BA | 850.00              |
| FLUKE                | 8062A   | MULTIMETER, DIG.     | 265.50              |
| B & K INSTRUMENTS IN | 2639    | PREAMPLIFIERS        | 887.00              |
| B & K INSTRUMENTS IN | 2639    | PREAMPLIFIERS        | 887.00              |
| GENRAD               | W20MT3A | VARIAC               | 145.00              |
| RUSKA                | 10735   | BARRIER              | 300.00              |
| SENCORE              | LC75    | SIGNAL ANALYZER      | 805.00              |
| VOLUMETRICS          | V-1R    | CONTROLLER           | 250.00              |
| PSI                  | ESP-16  | PRESSURE SCANNER     | 2,350.00            |
| OPTRONICS            | 100D    | LIGHT STANDARD       | 210.00              |
| MAG. PERIPH.         | TB3A2A  | TESTER,DISK DR       | 6,727.75            |
| CLARK                | C500-25 | FORK LIFT            | 8,950.00            |
| HEWLETT PACKARD      | 400E    | VOLTMETER AC         | 327.45              |
| DI-ACRO              | 24      | BRAKE                | 1,100.00            |
| HEWLETT PACKARD      | 5245L   | FREQ COUNTER         | 2,961.65            |
| KEITHLEY             | 130     | DMM                  | 115.00              |
| T RUSS               | MF-7-3  | CABINET, STORAGE     | 575.00              |
| TEKTRONIX            | 1M1     | PLUG IN UNIT         | 200.00              |
| FLUKE                | 895A    | VOLTMETER            | 2,167.56            |
| ONO SOKKI            | CF 920  | SPEC. ANALYZER       | 20,805.00           |
| EPSON                | FX286C  | PRINTER              | 539.00              |
| FLUKE                | 803BR   | AC DC DIF MTR        | 900.00              |
| GENRAD               | 1986    | SOUND CALIBRA.       | 855.95              |
| TEKTRONIX            | 2215    | OSCILLOSCOPE         | 1,344.00            |
| SONY                 | PVM1270 | MONITOR TV           | 741.00              |
| ELECTRA SCIENTIFIC   | 642M1   | ACCELEROMETER        | 590.00              |
| TEKTRONIX            | T922R   | OSCILLOSCOPE         | 1,136.81            |
| L & N                | 4321B   | RESIST. STND.        | 3,903.00            |
| HEWLETT PACKARD      | 745A    | CALIBRATOR           | 4,521.00            |



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| Manufacturer Name    | Model      | Description          | Acquisition Cost |
|----------------------|------------|----------------------|------------------|
| B & K                | 4134       | MICROPHONE           | 900.00           |
| BLAKE MFG CO         | CO-AX      | INDICATOR            | 160.00           |
| GENRAD               | W5MT3A     | VARIAC               | 95.00            |
| POWER DESIGN         | 4005       | POWER SUPPLY         | 147.00           |
| GENRAD               | 1201B      | POWER SUPPLY         | 175.00           |
| HEWLETT PACKARD      | 721A       | POWER SUPPLY         | 165.00           |
| WELCH                | 1402       | VACUUM PUMP          | 420.00           |
| WELCH                | 1402       | VACUUM PUMP          | 420.00           |
| B & K                | 2426       | VOLTMETER            | 1,600.00         |
| BURR BROWN           | 9509       | PWR SUPPLY           | 308.00           |
| B & K INSTRUMENTS IN | 2803       | POWER SUPPLY         | 471.14           |
| SIMPSON              | 260-6      | VOM                  | 60.28            |
| SIMPSON              | 260-6      | VOM                  | 60.28            |
| HEWLETT PACKARD      | 461A       | AMPLIFIER            | 352.05           |
| B & K INSTRUMENTS IN | 2426       | VOLTMETER            | 1,657.00         |
| RUSKA                | 6000       | PRESS. GAUGE         | 3,905.00         |
| HEWLETT PACKARD      | 465A       | AMPLIFIER            | 191.54           |
| B & K INSTRUMENTS IN | 172        | EXCITER CONT         | 120.00           |
| HELICOIL             | -02-832    | HELICOIL SET         | 23.90            |
| INTERNATIONAL BUSINE | 3192       | COMPUTER TERMINAL    | 747.00           |
| HI-TEK               | RT-101     | KEYBOARD             | 90.00            |
| PACE INC             | CRAFT 25   | PCB REPAIR STATION   | 9,945.00         |
| HEWLETT PACKARD      | 41CV       | CALCULATOR           | 973.25           |
| MAX TECH             | PB64       | BUFFER PRINTER       | 99.00            |
| EPSON                | LX800      | PRINTER              | 300.00           |
| TEKTRONIX            | 212        | OSCILLOSCOPR         | 703.25           |
| B & K INSTRUMENTS IN | 4134/S     | MICROPHONE           | 447.00           |
| KEITHLEY             | 130        | DMM                  | 115.00           |
| RUSKA                | 5100       | DEAD WT TESTER       | 9,180.00         |
| ONO SOKKI            | CF360      | ANALYZER             | 16,055.00        |
| MICRODOT             | F321A      | OSCILLATOR SIN       | 544.75           |
| B & K INSTRUMENTS IN | 2619       | PREAMPLIFIER         | 442.00           |
| GERTSCH              | RT-5       | RATIO TRANS.         | 400.00           |
| SUN                  | 19MQ       | MONITOR/KEYBOARD/MOU | 4,800.00         |
| SUN                  | 19MQ       | MONITOR/KEYBOARD/MOU | 4,800.00         |
| TEKTRONIX            | Z          | PLUGIN PREAMP        | 528.50           |
| KISTLER              | 303B       | ACCELEROMETER        | 585.00           |
| TEKTRONIX            | 81         | PLUG-IN              | 175.00           |
| HEWLETT PACKARD      | 5302A      | COUNTER              | 900.00           |
| TEKTRONIX            | 067-0587-0 | SIG. STANDARD        | 385.00           |
| HEWLETT PACKARD      | 3325B      | FREQUENCY SYNTHESIZE | 5,284.00         |
| TEKTRONIX            | 7A26       | AMPLIFIER, DUAL TRAC | 1,050.00         |
| MONARCH              | EE         | LATHE                | 15,140.00        |
| TEKTRONIX            | 4631       | RECORDER             | 4,738.75         |
| UNHOLTZ DICKIE       | 1611       | CAL STANDARD         | 1,515.00         |
| TEKTRONIX            | 335        | OSCILLOSCOPE         | 2,104.31         |
| B & K INSTRUMENTS IN | 2426       | VOLTMETER AC         | 1,600.00         |
| B & K INSTRUMENTS IN | 2426       | VOLTMETER AC         | 1,600.00         |
| WEINSCHEL            | PA-2       | ATTEN. CALIB         | 4,650.00         |
| FLOW DYNE            | N160400    | SONIC NOZZLE         | 250.00           |
| HEWLETT PACKARD      | 745A       | VOLTAGE CALIB        | 4,520.98         |
| FLUKE                | Y8100      | CURRENT PROBE        | 259.00           |

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|----------------------|------------|----------------------|------------------|
| BALLANTINE           | 3008F2     | AC VOLTMETER         | 350.00           |
| BALLANTINE           | 300H       | AC VOLTMETER         | 300.00           |
| FLUKE                | 5205A      | POWER AMPLIFIER      | 8,413.00         |
| KENNEDY              | 9300       | TAPE DRIVE           | 9,585.00         |
| B & K INSTRUMENTS IN | 2606C      | AMPLIFIER            | 1,431.36         |
| DODGE                | KARYVAN    | TRUCK                | 8,040.00         |
| TEKTRONIX            | 178        | TESTER               | 1,067.00         |
| LEITZ                |            | DIVIDING HEAD        | 5,447.00         |
| FLUKE                | 77         | DIGITAL MULTIMETER   | 130.00           |
| B & K                | 2639       | PRE AMP              | 593.00           |
| B & K                | 2639       | PRE AMP              | 593.00           |
| WESTON               | 799        | INSULAT TESTER       | 108.00           |
| GENRAD               | W5TM3A     | VARIAC               | 95.00            |
| TEKTRONIX            | FG503      | FUNCT GEN            | 315.25           |
| SHARP                | EL5500I    | CALCULATOR           | 70.00            |
| CORNELL-DUBILIER     | CDC3       | DECADE CAP.          | 25.00            |
| HEWLETT PACKARD      | 5245L      | FREQ. METER          | 2,984.15         |
| TRIPLETT             | 310        | VOLT OHM METER       | 69.00            |
| FIRTH                | 61-7700    | ONE CYL CART         | 21.50            |
| HEWLETT PACKARD      | 10407A     | EXTENDER FRAME       | 77.25            |
| UDS                  | 201B       | MODEM, DATA          | 625.00           |
| NTI                  | C15        | TESTER, COLOR MONITO | 169.95           |
| ONAN                 | 3-0AJ-1    | GENERATOR            | 610.20           |
| ONAN                 | 3-0AJ-1    | GENERATOR            | 610.20           |
| APPLE                | A9M0303    | PRINTER              | 532.00           |
| APPLE                | A9M0108    | DISK DRIVE           | 474.00           |
| MAGNAVOX             | 7BM623     | DISPLAY, COMPUTER    | 500.00           |
| KEITHLEY             | 260        | NANOVOLT SORCE       | 502.60           |
| SHALLCROSS           | 6860RM     | RESISTANCE BOX       | 150.00           |
| INTECOLOR            | 8001R      | TERMINAL W/KEYBOARD  |                  |
| HELICOIL             | 3/8-16     | HELICOIL SET         | 26.70            |
| GENRAD               | W5MT3A     | VARIAC               | 50.00            |
| GENRAD               | 1409F      | TD CAP               | 55.00            |
| ESI                  | SR104      | STD. RESISTOR        | 3,235.00         |
| HEWLETT-PACKARD      | 11812A     | VHF ATTENUATOR       | 1,995.00         |
| NETWORK TECHNOLOGIES | MONTEST EG | EGA DISPLAY TESTER   | 280.00           |
| PAROSCIENTIFIC       | 600B       | PRESSURE COMPUTER    | 3,903.00         |
| PC LIMITED           | 200        | COMPUTER             | 3,051.00         |
| LINGAR               | 1095       | HEAT GUN             | 115.00           |
| DEC                  | RX-01      | DISC DRIVE           | 9,936.00         |
| ELECTRONIC DEVELOPME | MV100N     | POWER SUPPLY         | 805.10           |
| ELECTRONIC DEVELOPME | MV100N     | VOLTAGE STD.         | 805.10           |
| RUSKA                | 600-801    | PRESS MEA SYST       | 4,027.60         |
| DATA PRECISION       | 175        | MULTIMETER           | 183.33           |
| FLUKE                | 4-2001     | THERMOCOUPLE SELECTO | 635.00           |
| STANDARD             | MCH-4095N  | MONITOR              | 475.00           |
| EPSON                | EX800      | PRINTER              | 425.00           |
| GENRAD               | 1409-K     | STD. CAPACITOR       | 85.00            |
| GENRAD               | 1409-L     | STD. CAPACITOR       | 85.00            |
| CEL INSTRUMENTS      | 213        | NOISE GENERATOR      | 611.13           |
| HEWLETT PACKARD      | 3312A      | FUNCTION GENERATOR   | 1,619.75         |
| HEWLETT PACKARD      | 3478A      | MULTIMETER, DIGITAL  | 937.29           |

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| Manufacturer Name    | Model     | Description          | Acquisition Cost |
|----------------------|-----------|----------------------|------------------|
| TEKTRONIX            | TM5006A   | POWER MODULE         | 1,164.00         |
| B & K                | 4134      | MICROPHONE           | 900.00           |
| EG&G                 | 992       | DEW POINT INDICATOR  | 7,765.00         |
| GSE                  |           | PUSH CART            | 15.00            |
| TEKTRONIX            | 200C      | SCOPE CART           | 125.00           |
| GENRAD               | 1482G     | STD INDUCTOR         | 150.00           |
| CLIMATRONICS         | 101484    | WEATHER RECORDING SY | 13,675.00        |
| TEKTRONIX            | PG506     | GENERATOR            | 1,978.00         |
| GENERAL RESISTANCE   | E-35      | POWER SUPPLY         | 725.00           |
| LAMBDA               | LH124FM   | POWER SUPPLY         | 179.00           |
| TRUE TIME            | 468DC     | DIGITAL CLOCK        | 2,600.00         |
| TABB                 | NONE      | FILE SHELF           | 403.00           |
| MERIAM               | A646      | BELLOWS              | 150.00           |
| SORENSEN             | T50-1.5   | POWER SUPPLY         | 252.00           |
| PANASONIC            | LF-5010   | DISK DRIVE           |                  |
| HEWLETT PACKARD      | 3325A     | FREQ SYNTHESIZ       | 2,970.00         |
| IBM                  | 1391401   | KEYBOARD             | 85.00            |
| MONTEREY RESEARCH    | 9MP1336   | SHOCK MACHINE        | 7,613.50         |
| GUILDLINE            | 9734120   | TEMP. BATH           | 6,432.00         |
| GENRAD               | 1115C     | OSCILLATOR           | 1,950.00         |
| DREMEL               | 395       | MOTO-TOOL            | 127.00           |
| PERSONAL COMPUTER    | MCK101-FX | KEYBOARD             | 90.00            |
| NUDATA               | 921-72    | INTERFACE TEST SET   | 163.20           |
| TEKTRONIX            | TU7       | TEST PLUG IN         | 200.00           |
| KROHN HITE           | 5600      | FUNCTION GEN.        | 483.15           |
| SENCORE              | LC75      | CAPACITOR ANALYZER   | 805.50           |
| HEWLETT PACKARD      | 434A      | CALORIMET MTR        | 1,600.00         |
| FLUKE                | 80E       | DEC VOLT DIV.        | 350.00           |
| B & K INSTRUMENTS IN | 2426      | VOLTMETER AC         | 1,600.00         |
| HEWLETT PACKARD      | 5512A     | COUNTER, ELECTRONIC  | 1,082.00         |
| WELCH                | 8814A     | VACUUM PUMP          | 1,140.00         |
| PC'S LIMITED         | AT100     | COMPUTER, PERSONAL   | 1,200.00         |
| DO ALL               | 1BX24X4   | GRAN SURF PLAT       | 187.00           |
| GENRAD               | W20MT3    | VARIAC               | 95.00            |
| HONEYWELL            | 101       | TAPE RECORDER        | 21,061.00        |
| L & N                | 4035B     | STD. RESISTOR        | 150.00           |
| HEWLETT-PACKARD      | 8116A     | FUNCTION GENERATOR   | 4,036.47         |
| EPSON                | FX86E     | PRINTER              | 386.00           |
| MOTOROLA             | H99SA+03H | 2-WAY FM RADIO       | 1,262.00         |
| IWATSU               | SS-5710D  | OSCILLOSCOPE         | 1,398.99         |
| IWATSU               | SS-5711D  | OSCILLOSCOPE         | 1,749.62         |
| TEKTRONIX            | 2430A     | OSCILLOSCOPE         | 7,473.00         |
| PAROSCIENTIFIC       | 2100-A    | PRESSURE SENSO       | 2,050.00         |
| TEKTRONIX            | 4105      | TERMINAL             | 3,196.00         |
| ENDEVCO              | 2718A     | AMPLIFIER            | 800.00           |
| SUNDSTRAND           | QA900     | ACCELEROMETER        | 1,060.00         |
| HEWLETT PACKARD      | 350D      | ATTENUATOR           | 160.00           |
| PACIFIC MEASUREMENTS | 1038-H13  | AMPLIFIER            | 1,375.00         |
| RUSKA                | 3891-801  | CONTROLLER           | 1,500.00         |
| UNGAR                | 4000      | HOT-VAC              | 354.00           |
| B & K INSTRUMENTS IN | 2619/S    | PREAMPLIFIER         | 250.00           |
| GENRAD               | 1490F     | DECADE INDUCT        | 586.50           |

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|----------------------|------------|----------------------|--------------------|
| GERTSCH              | 501        | RATIO X FORMS        | 300.00             |
| B & K INSTRUMENTS IN | 2619       | AMPLIFIER            | 535.68             |
| B & K INSTRUMENTS IN | 4134/S     | MICROPHONE           | 447.00             |
| B & K INSTRUMENTS IN | 4133/S     | MICROPHONE           | 447.00             |
| FLUKE                | 5200A      | VOLT CALIBRA         | 4,360.15           |
| MOTOROLA             | HCN1036E90 | CONTROLLER           | 512.00             |
| HEWLETT PACKARD      | 1116A      | SCOPE CART           | 100.00             |
| VIGOR                | BC100      | BENCH CHAIR          | 75.00              |
| OPAD                 | KM87       | POWER SUPPLY         | 185.00             |
| TEK                  | TM503      | POWER MODULE         | 150.00             |
| FLUKE                | 8840A      | DIG MULTIMETER       | 790.08             |
| ELECTRON             | 1120       | THERMOCOUPLE CALIBRA | 4,560.00           |
| BLACK & WEBSTER      | P10-10-2   | POWER SUPPLY, P.S.   | 1,485.00           |
| HEWLETT PACKARD      | 456A       | PROBE CURRENT        | 250.00             |
| HEWLETT PACKARD      | 6102A      | PWR SUP.             | 362.00             |
| HEWLETT PACKARD      | 5254A      | FREQ.CONVERTER       | 2,200.00           |
| GENERAL EASTERN      | DPG-300    | HUMIDITY GENERATOR   | 3,325.00           |
| POTTER               | 3/8-5/8    | EXTRACTOR TOOL       | 50.00              |
| B & K INSTRUMENTS IN | 2804       | PWR. SUPPLY, MIC     | 988.95             |
| B & K                | 4134       | MICROPHONE           | 908.00             |
| MASTER               | 10008      | HEAT GUN             | 30.00              |
| HASTINGS             | VT6B       | VACUUM GAUGE         | 255.00             |
| GENERAL RESISTANCE   | LRC201     | VOLT COMPENSAT       | 250.00             |
| ENDEVCO              | 2623       | POWER SUPPLY         | 255.00             |
| HEWLETT PACKARD      | 5512A      | COUNTER              | 982.45             |
| GENRAD               | 105T       | STD RESISTANCE       | 750.00             |
| L & N                | 4223B      | STD RESISTOR         | 550.00             |
| L & N                | 4222B      | STD RESISTOR         | 250.00             |
| J.A.KING             | DS1-30K    | DIGITAL SCALES       | 1,670.00           |
| HEWLETT PACKARD      | 3478A      | DIG MULTIMETER       | 1,248.00           |
| TEKTRONIX            | 7A13       | PLUG-IN              | 2,659.20           |
| TEKTRONIX            | 7623       | OSCILLOSCOPE         | 3,347.00           |
| TEKTRONIX            | SG503      | SIGNAL GEN           | 1,279.00           |
| B & K                | 2639       | PREAMPLIFIER         | 600.00             |
| VEECO                | RG-31X     | CONTROLLER           | 573.00             |
| DATAMETRICS          | 700        | POWER SUPPLY         | 550.00             |
| INTERNATIONAL BUSINE | 3192       | COMPUTER TERMINAL    | 747.00             |
| INTERNATIONAL BUSINE | 1390702    | KEYBOARD             | 200.00             |
| OKIDATA              | 92         | DIG PRINTER          | 539.00             |
| TRYGON               | SHR4015    | PWR. SUP.            | 199.00             |
| HEWLETT PACKARD      | 59303A     | CONVERTER            | 1,625.00           |
| B & K INSTRUMENTS IN | 2619       | PREAMPLIFIER         | 442.00             |
| INTERNATIONAL BUSINE | 1390702    | KEYBOARD             | 200.00             |
| FLUKE                | -6802      | INTERFACE            | 1,090.00           |
| TEKTRONIX            | K          | PLUG IN AMP          | 147.00             |
| TRIPLETT             | 310        | VOLT OHM METER       | 49.68              |
| FLUKE                | 1920A      | FREQ COUNTER         | 1,446.41           |
| HEWLETT PACKARD      | 200CD      | SIGNAL GEN           | 500.00             |
| SOLA                 | 28510      | POWER SUPPLY         | 330.00             |
| TEKTRONIX            | PG506      | CALIBRATION GENERATO | 2,845.25           |
| A H                  | 142        | CLEAN BENCH          | 1,020.00           |
| FLUKE                | 80E-10     | VOLTAGE DIVIDE       | 395.00             |

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| Manufacturer Name    | Model    | Description          | Acquisition Cost |
|----------------------|----------|----------------------|------------------|
| HEWLETT PACKARD      | 8614A    | SIG. GENERATOR       | 1,661.81         |
| HEWLETT PACKARD      | K02-434  | CALIBRATOR           | 1,000.00         |
| HEWLETT PACKARD      | 651B     | OSCILLATOR           | 613.85           |
| BAUSCH-LOMB          |          | MICROSCOPE           | 199.00           |
| GATEWAY              | PMV1448  | DISPLAY              | 300.00           |
| GATEWAY              | 386/25   | COMPUTER             | 2,200.00         |
| HEWLETT PACKARD      | 400FL    | VOLTMETER            | 336.60           |
| ESI                  | RV722    | VOLT DIVIDER         | 900.00           |
| HEWLETT PACKARD      | 721A     | POWER SUPPLY         | 147.10           |
| B & K INSTRUMENTS IN | 4134S    | MICROPHONE           | 300.00           |
| FLUKE                | 8000A    | DIGITAL MULT         | 338.53           |
| RUSKA                | 6000-80  | MANOMETER            | 8,135.00         |
| B & K                | 4133     | MICROPHONE           | 900.00           |
| TELEVIDEO            | 925      | MONITOR              |                  |
| TEKTRONIX            | 545B     | SCOPE                | 1,635.48         |
| B & K INSTRUMENTS IN | 2804     | POWER SUPPLY         | 988.95           |
| POWSTRON             | PA3001   | ULTRASON CLEAN       | 865.00           |
| SIMPSON              | 260      | VOM                  | 63.00            |
| HEWLETT PACKARD      | 400E     | VOLTMETER            | 341.55           |
| FLUKE                | 8520A    | DIG MULTIMETER       | 3,495.00         |
| FLUKE                | 883AB    | DIFF VOLTMTR         | 1,380.00         |
| ROCKWELL             | 636      | DRILL                | 65.00            |
| NESLAB               | CFT-25D  | RECIRCULATOR         | 1,547.15         |
| HEWLETT-PACKARD      | 7440A    | PRINTER/PLOTTER      | 854.70           |
| RCA                  | WV38A    | VOM                  | 39.59            |
| B & K INSTRUMENTS IN | 2804     | POWER SUPPLY         | 160.00           |
| L & N                | 9009-A4  | TEMP STANDARD        | 2,852.00         |
| TRIPLETT             | 3525     | DIGI-PROBE           | 65.00            |
| KINEMATRICS          | 468-DC   | DIGITAL CLOCK        | 3,939.37         |
| DATA PROOF           | 160A     | SCANNER              | 3,650.00         |
| HEWLETT-PACKARD      | 3325B    | SYNTHESIZER, FREQUEN | 4,310.00         |
| HEWLETT-PACKARD      | 33449A   | PRINTER, LASER       | 1,629.00         |
| GATEWAY              | PMV1448  | MONITOR              | 400.00           |
| HAZELTINE            | 1500     | TERMINAL             |                  |
| EXACT                | 124      | GENERATOR ELEC       | 577.15           |
| SUNDSTRAND           | QA900    | ACCELEROMETER        | 1,060.00         |
| SUNDSTRAND           | QA900    | ACCELEROMETER        | 1,060.00         |
| ELECTRIC NAVIGATION  | 550L     | PWR AMPLIFIER        | 6,050.00         |
| VERIFLO              | 6605580  | REGULATOR            | 135.00           |
| CRAFTSMAN            | 965024N  | TOOL CHEST           | .00              |
| CLAROSTAT            | 240      | DECADE RESIST        | 70.00            |
| INTERNATIONAL BUSINE | 5150174  | COMPUTER             | 1,843.00         |
| HEWLETT PACKARD      | 98561    | COMPUTER, DIGITAL    | 2,856.00         |
| B & K INSTRUMENTS IN | 2639     | PREAMPLIFIERS        | 887.00           |
| B & K INSTRUMENTS IN | 4135     | MICROPHONE           | 200.00           |
| HEWLETT PACKARD      | 5005B    | ANALYZER SIGNA       | 3,633.75         |
| DATA PRECISION       | 245      | DIG MULTIMETER       | 286.00           |
| VISUAL TECH          | 550      | TERMINAL             |                  |
| AERO VAC             | 202      | GAGE CONT ANAL       | 2,000.00         |
| GENRAD               | 1482N    | STD. INDUCR.         | 160.00           |
| HEWLETT PACKARD      | 721A     | POWER SUPPLY         | 147.10           |
| PACIFIC MEASUREMENTS | 1038-V12 | AMPLIFIER            | 1,750.00         |

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|----------------------|------------|----------------------|------------------|
| FLUKE                | 87         | DIGITAL MULTIMETER   | 252.00           |
| EPSON                | FX-286     | PRINTER              |                  |
| WELCH                |            | VAC PUMP             | 200.00           |
| INTELLIGENT SYSTEMS  | 8001G      | TERMINAL             | 2,950.00         |
| DO ALL               | 779        | OMNI-VISE            | 449.00           |
| TEKTRONIX            | 2A60       | PLUG IN              | 105.00           |
| SIMPSON              | 260        | VOM                  | 63.00            |
| HEWLETT PACKARD      | 5300A      | COUNTER SYSTEM       | 391.05           |
| FLUKE                | 8810       | DIG. MULTIMETER      | 1,218.00         |
| UNHOLTZ DICKIE       | TA100A     | POWER AMPLIFIER      | 7,235.00         |
| UNHOLTZ DICKIE       | MA311      | CONSOLE, CONTROL     | 7,930.00         |
| AMDEK                | 300A       | TERMINAL             | 139.00           |
| FLUKE                | 2176A      | TEMP INDICATOR       | 546.25           |
| GENRAD               | 1409Y      | STD CAP              | 200.00           |
| CLAROSTAT            | 240C       | DECADE RESIST        | 99.00            |
| TEKTRONIX            | T922R      | OSCILLOSCOPE         | 1,180.35         |
| TEKTRONIX            | T922R      | OSCILLOSCOPE         | 1,180.35         |
| RUBICON              | 4035B      | STD RESISTOR         | 150.00           |
| ISOTHERMAL           | ITL-M-1770 | FURNACE              | 17,765.00        |
| HEWLETT-PACKARD      | 8904A      | WHITE NOISE GENERATO | 2,759.00         |
| HEWLETT-PACKARD      | 3458A      | MULTIMETER           | 5,687.00         |
| UNITED SYSTEMS       | 311        | VOLTAGE STD          | 637.00           |
| IDEAL AEROSMITH      | 18-53-4    | TACH. TESTER         | 8,694.00         |
| DATA PRECISION       | 245        | DIG MULTIMETER       | 301.00           |
| GENRAD               | 1531A      | STROBOTAC            | 279.77           |
| GENRAD               | 1409L      | STD CAP              | 55.00            |
| FLUKE                | 87         | DIGITAL MULTIMETER   | 252.00           |
| IBM                  | 5151       | MONITOR              |                  |
| ESI                  | 874        | PHASE COMP           | 402.00           |
| TEKTRONIX            | DC505A     | COUNTER/TIMER        | 1,591.54         |
| B & K INSTRUMENTS IN | 2619/S     | PREAMPLIFIER         | 250.00           |
| HEWLETT-PACKARD      | 3458A      | MULTIMETER           | 5,687.00         |
| OKIDATA              | 92         | DIG PRINTER          | 539.00           |
| WYSE                 | WY-60      | TERMINAL             | 294.00           |
| DODGE                | KARYVAN    | TRUCK                | 8,040.00         |
| TEKTRONIX            | FPEN834    | TEST SET             | 2,327.50         |
| SIMPSON              | 260        | MULTIMETER           | 50.00            |
| ELEC SCIENTIFIC      | 242D       | WHEAT BRIDGE         | 4,315.50         |
| FLUKE                | 8000A      | DIG MULTIMETER       | 290.03           |
| HEWLETT PACKARD      | 3455A      | VOLTMETER            | 3,666.00         |
| KINEMATRICS          | 468DC      | DIGITAL CLOCK        | 3,963.00         |
| GENRAD               | 5A         | VARIAC               | 35.00            |
| PROCUNIER            | E          | TAP HEAD             | 85.00            |
| HEWLETT PACKARD      | 3495A      | RELAY SCANNER        | 3,415.50         |
| KROHN HITE           |            | B P FILTER           | 975.00           |
| UNION CARBIDE        | 891-KZ     | NITROGEN TANK        | 1,045.00         |
| WELCH                | 1402       | VAC PUMP             | 325.00           |
| FLUKE                | 8840A      | DIG MULTIMETER       | 790.08           |
| HAZELTINE            | 4DTD155207 | MONITOR              |                  |
| B & K INSTRUMENTS IN | 2706       | SHAKER AMP.          | 891.10           |
| TEKTRONIX            | 335        | OSCILLOSCOPE         | 1,862.44         |
| MG INDUSTRIES        | 1678       | PRESSURE REGULATOR   | 199.00           |

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| Manufacturer<br>Name | Model    | Description          | Acquisition<br>Cost |
|----------------------|----------|----------------------|---------------------|
| SYSTRON DONNER       | 8140     | SEARCH CONTROL       | 1,568.00            |
| PLANTRONICS          | HSB552-1 | HEAD PHONES          | 113.33              |
| PLANTRONICS          | HSB552-1 | HEAD PHONES          | 113.33              |
| B & K                | 2426     | VOLTMETER            | 1,600.00            |
| HEIDENHAIN           | ROD800   | ENCODER              |                     |
| GANDALF              | LDS309   | MODEM                | 450.00              |
| HEWLETT PACKARD      | 400FL    | VOLTMETER            | 336.60              |
| WEINSCHEL            | AS-1     | ATTENUATOR           | 478.65              |
| KISTLER              | 303B     | SERVO ACCEL          | 585.00              |
| PYROINS              | 95       | PYROMETER            | 795.00              |
| B & K                | 2619     | PRE-AMP              | 600.00              |
| B & K                | 4145     | MICROPHONE           | 900.00              |
| NASA                 |          | VIB. CONSOLE         | 100.00              |
| PRECISION MOTION     |          | I C TESTER           | 259.00              |
| TEKTRONIX            | 475      | OSCILLOSCOPE         | 2,902.50            |
| SIMPSON              | 260      | V O M                | 50.00               |
| B & K INSTRUMENTS IN | 4220     | PISTON PHONE         | 250.00              |
| IDEAL AEROSMITH      | 45-133A  | THERMO STRIP         | 25.00               |
| B & K                | 4134     | MICROPHONE           | 908.00              |
| TABB                 |          | FILE CABINET         | 540.54              |
| TEKTRONIX            | TM501    | POWER SUPPLY         | 135.00              |
| TEKTRONIX            | 670A     | MONITOR              | 3,340.00            |
| L & N                | 4030B    | STD. RESISTOR        | 150.00              |
| B & K                | 2639     | PRE AMP              | 593.00              |
| EPSON                | FX286C   | PRINTER              | 539.00              |
| LEADER               | LTC-906  | TRANSISTOR TESTER    | 250.00              |
| L & N                | 4040B    | STD. RESISTOR        | 57.00               |
| KEITHLEY             | 130A     | DIG MULTIMETER       | 113.90              |
| VERSATEC             | MTE15    | MATRIX TESTER        | 1,296.00            |
| GATEWAY              | 386/33   | COMPUTER             | 3,190.00            |
| GENRAD               | 1409-G   | STD. CAPACITOR       | 85.00               |
| WELCH                | 8814A    | VACUUM PUMP          | 1,140.00            |
| MODCOMP              | 4170-1   | RECORDER             | 24,252.00           |
| MODCOMP              | 7683     | COMPUTER             | 250,704.00          |
| IBM                  | 5150     | COMPUTER             | 2,206.00            |
| HEWLETT PACKARD      | 3457A    | MULTIMETER           | 2,646.00            |
| FLUKE                | 883AB    | V T V M              | 1,378.70            |
| SHALLCROSS           | 6860RM   | RESISTANCE BOX       | 150.00              |
| INLAND               | 1500CP   | POWER SUPPLY         | .00                 |
| FLUKE                | 5200A    | VOLT CALIBRA         | 3,915.10            |
| VISUAL INFO          | 27       | GENERATOR BAR        | 850.00              |
| B & K                | 2639     | PRE AMP              | 593.00              |
| STANFORD RESEARCH    | DG535    | GENERATOR, PULSE     | 3,508.00            |
| KEPCO                | KM251    | POWER SUPPLY         | 604.16              |
| IBM                  | 5151     | MONITOR              | 240.00              |
| IBM                  | MODEL    | KEYBOARD             | 150.00              |
| GRAPH-ON             | G0250    | TERMINAL, DISPLAY W/ |                     |
| HEWLETT PACKARD      | 411A     | RF VOLTMETER         | 450.00              |
| B & K INSTRUMENTS IN | 2619     | PREAMPLIFIER         | 250.00              |
| FLUKE                | 1952B    | FREQ COUNTER         | 769.16              |
| HEWLETT PACKARD      | 6102A    | POWER SUPPLY         | 311.85              |
| KLINGER              | UR100PP  | ROTATION STAGE       | 2,670.00            |

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|----------------------|------------|----------------------|---------------------|
| FLUKE                | 8060A      | DIG. MULTIMETER      | 349.00              |
| HEWLETT PACKARD      | 5321B      | FREQ COUNTER         | 775.00              |
| CONSOLIDATED CONTROL | TD2903-    | TAPE DEGAUSSER       | 1,353.40            |
| KEITHLEY             | 130A       | DIG MULTIMETER       | 113.90              |
| INFRARED IND.        | IR463      | BLACK BODY           | 4,595.00            |
| FLUKE                | 77         | MULTIMETER, DIG.     | 116.10              |
| FLUKE                | -8048      | INTERFACE            | 1,995.00            |
| HEWLETT PACKARD      | 6102A      | POWER SUPPLY         | 368.00              |
| L & N                | 4221B      | STD RESISTOR         | 250.00              |
| B & K                | 2639       | PREAMPLIFIER         | 600.00              |
| RCA                  | WV-38A     | V O M                | 39.59               |
| B & K                | 2619       | PRE-AMP              | 600.00              |
| GENERAL EASTERN      | M3         | HYGROMETER           | 10,000.00           |
| ONAN                 | 3DAU-1R    | GENERATOR            | 618.00              |
| FLUKE                | 1722/A     | INST CONTROLER       | 9,940.00            |
| KINTEL               | NONE       | CAMERA MOUNT         | 507.00              |
| DELTA DESIGN         | 9059-5-31  | TEST TEMPERATURE CHA | 6,290.00            |
| INTERNATIONAL BUSINE | 5150174    | COMPUTER             | 1,843.00            |
| FLUKE                | 8506A      | MULTIMETER RMS       | 5,920.42            |
| B & K INSTRUMENTS IN | 2804       | POWER SUPPLY         | 988.95              |
| GENRAD               | 1450TB     | ATTENUATOR DE        | 375.00              |
| PLANTRONICS          | HSB552-1   | HEAD PHONES          | 113.33              |
| HICKOK               | 539B       | TUBE TESTER          | 410.00              |
| NTI                  | PC         | TESTER, MONOCHROME M | 129.95              |
| HEWLETT PACKARD      | 5245L      | FREQ. METER          | 2,984.15            |
| QSC                  | 1100       | AMPLIFIER            | 398.90              |
| NASA                 |            | PRESS CONSOLE        | 150.00              |
| SIMPSON              | 260        | VOM                  | 63.00               |
| B & K                | 2619       | PRE-AMP              | 600.00              |
| B & K                | 4145       | MICROPHONE           | 900.00              |
| B & K INSTRUMENTS IN | 2804       | POWER SUPPLY         | 160.00              |
| DATAMETRICS          | 1015       | SIGNAL COND.         | 1,740.00            |
| DI-ACRO              | 3          | SHEARER              | 335.00              |
| TRIPLETT             | 310        | VOLT OHM METER       | 55.00               |
| EG&G                 | 300        | HYGROMETER D.P       | 9,244.90            |
| FLUKE                | 8840A      | DIG MULTIMETER       | 930.00              |
| GRAPH-ON             | 140        | TERMINAL W/KEYBOARD  |                     |
| IBM                  | 5151       | DISPLAY, COMPUTER    | 192.00              |
| RUBICON              | 4025B      | STD. RESISTOR        | 150.00              |
| STARRETT             | 199        | LEVEL, PRECISION     | 256.60              |
| CCS                  | 7712A      | INTERFACE BRD        | 202.00              |
| B & K INSTRUMENTS IN | 2639       | PREAMPLIFIERS        | 887.00              |
| CONSOLIDATED CONTROL | 6-201      | PRESS STD            | 2,555.00            |
| B & K INSTRUMENTS IN | 4134       | MICROPHONE           | 210.00              |
| GENRAD               | 106T       | RESISTANCE STD       | 800.00              |
| FLUKE                | 207        | RECEIVER             | 2,775.00            |
| HEWLETT PACKARD      | 5245L      | COUNTER              | 2,697.25            |
| HEWLETT PACKARD      | 33E        | CALCULATOR           | 102.00              |
| CDC                  | PA5A1A     | DISK DRIVE           | 14,580.00           |
| HAZELTINE            | 4DTD155207 | TERMINAL             |                     |
| LEAR-SIEGLER         | ADM-11     | MONITOR/KEYBOARD     |                     |
| DELTA DESIGN         | 3900CN     | TEMP CHAMBER         | 1,717.00            |



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|----------------------|----------|-------------------|------------------|
| B & K                | 4134     | MICROPHONE        | 908.00           |
| B & K                | 4134     | MICROPHONE        | 900.00           |
| B & K                | 2426     | VOLTMETER         | 1,600.00         |
| GENRAD               | W5MT3A   | VARIAC            | 178.00           |
| COMPUADD             | A000     | COMPUTER          | 2,000.00         |
| STARRETT             | AG16CLM  | GAGE BLOCK SET    | 2,275.00         |
| WALLACE & TIERNAN    | FA160    | PRESSURE GAGE     | 234.00           |
| HEWLETT PACKARD      | 59401A   | ANALYZER          | 2,500.00         |
| ONAN                 | 3-0AJ-1  | GENERATOR         | 610.20           |
| CALZONE CASE         | NONE     | RUGGEDIZED CRT    | 2,494.00         |
| B & K                | 2426     | VOLTMETER         | 1,600.00         |
| WADDY                | NONE     | CABINET           | 154.00           |
| TEKTRONIX            | 180A     | TIME MARK GEN     | 625.00           |
| FLUKE                | 8120A    | VOLTMETER         | 868.15           |
| ONAN                 | 3-0AJ-1  | GENERATOR         | 610.20           |
| MANSFIELD GREEN      | T130     | DEAD WT TEST      | 686.30           |
| RUSKA                | 2465     | GAUGE, AIR PISTON | 10,050.00        |
| VICTOR               | SR471    | GAS REGULATOR     | 65.00            |
| KEITHLEY             | 5155     | MEGOHM STD        | 525.00           |
| HEWLETT-PACKARD      | 6237B    | POWER SUPPLY      | 930.00           |
| PLANTRONICS          | HSB552-1 | HEAD PHONES       | 113.33           |
| TELEVIDEO            | 970      | TERMINAL          |                  |
| KAYE INSTRUMENTS     | 2120-2C  | ICE POINT REF     | 482.80           |
| ALTEC                | 1591A    | AMPLIFIER         | 589.50           |
| HEWLETT PACKARD      | 463A     | AMPLIFIER, AC     | 715.00           |
| RUSKA                | 2470     | AIR PISTONGAGE    | 2,785.00         |
| NORTH HILL           | CS-14    | CURRENT SOURCE    | 2,250.00         |
| FLUKE                | 5100A    | METER CALIBRA.    | 7,918.99         |
| LEAR SIEGLER         | ADM-3A   | TERMINAL, COMP.   | 541.00           |
| TEKTRONIX            | 535A     | SCOPE             | 1,372.00         |
| B & K INSTRUMENTS IN | 2804     | POWER SUPPLY      | 962.00           |
| ODELL                | 44       | OVEN              | 1,665.85         |
| EPSON                | FX80     | PRINTER           | 200.00           |
| FLUKE                | 8062A    | MULTIMETER, DIG.  | 265.50           |
| KEITHLEY             | 5155     | MEGOHM STD        | 525.00           |
| KEITHLEY             | 5155     | MEGOHM STD        | 525.00           |
| MAGNAVOX             | 7BM623   | DISPLAY           | 500.00           |
| B & K                | 2619     | PRE-AMP           | 600.00           |
| B & K                | 4133     | MICROPHONE        | 900.00           |
| B & K                | 4133     | MICROPHONE        | 900.00           |
| WELCH                | 1402     | VAC PUMP          | 327.50           |
| JEBCO                | NONE     | CABINET           | 50.00            |
| KAMONIC              | EP3435   | KEYBOARD          | 100.00           |
| TEKTRONIX            | TM515    | POWER MODULE      | 500.00           |
| F & P                | 10C1505  | FLOW METER        | 287.00           |
| APPLE                | M5011    | COMPUTER          | 2,837.00         |
| B & K                | 4134     | MICROPHONE        | 900.00           |
| KEPCO                | SC181M   | POWER SUPPLY      | 307.08           |
| HONEYWELL            | 906      | OSCILLOGRAPH      | 2,942.00         |
| B & K INSTRUMENTS IN | 2804     | POWER SUPPLY      | 443.29           |
| B & K                | 4134     | MICROPHONE        | 900.00           |
| TEKTRONIX            | CG5001   | CALIBRATOR SCO    | 13,085.00        |

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|----------------------|----------|-----------------------|---------------------|
| FLUKE                | Y5000    | CAL. INTERFACE        | 555.00              |
| CONSOLIDATED CONTROL | 124A     | OSCILLOGRAPH          | 2,390.00            |
| HEWLETT PACKARD      | 3478A    | MULTIMETER            | 940.27              |
| EPSON                | MX-80    | PRINTER               |                     |
| ADRET                | 201SB    | SYNTHESIZER           | 2,551.10            |
| MENSOR               | 11600    | PRESS.INDICAT.        | 2,113.75            |
| B & K INSTRUMENTS IN | 4134     | MICROPHONE            | 210.00              |
| HEWLETT PACKARD      | 5300B    | FREQ. COUNTER         | 777.15              |
| B & K                | 4134     | MICROPHONE            | 908.00              |
| B & K INSTRUMENTS IN | 2804     | POWER SUPPLY          | 962.00              |
| KROHN HITE           | 3103     | FILTER                | 651.37              |
| PACIFIC MEASUREMENTS | 1038-V12 | AMPLIFIER             | 1,750.00            |
| MERIAM               | A646     | BELLOWS               | 60.00               |
| HEWLETT PACKARD      | 413A     | DC NULL METER         | 350.00              |
| FLUKE                | 332B     | POWER SUPPLY          | 2,295.00            |
| DODGE                | KARYVAN  | TRUCK                 | 8,040.00            |
| HEWLETT PACKARD      | 215A     | PULSE GEN             | 1,882.69            |
| VIDEOTEK             | DM-40-R  | DEMODULATOR           | 1,270.00            |
| DELTA DESIGN         | 3900CN   | TEST CHAMBER          | 3,215.00            |
| HEWLETT PACKARD      | 4491A    | MULTIPLEXER, ARMATURE | 425.25              |
| MENSOR               | 14000B   | PRESSURE INDICIATOR,  | 3,260.00            |
| FLUKE                | 8300A    | VOLTMETER             | 2,701.45            |
| FLUKE                | 8060A    | MULTIMETER, DIG.      | 314.00              |
| TEKTRONIX            | 105      | SQ WAVE GEN           | 435.00              |
| PAROSCIENTIFIC       | 600      | PRESS.MEAS SYS        | 1,848.00            |
| TEKTRONIX            | 455      | OSCILLOSCOPE          | 1,910.81            |
| EPSON                | P70RA    | PRINTER               | 200.00              |
| TEKTRONIX            | K213     | INSTRUMENT CART       | 675.00              |
| WESTON               | 433      | AC AMMETER            | 153.00              |
| SNAP ON TOOLS        | TQ12B    | TORQE WRENCH          | 50.00               |
| BLACK & DECKER       | 375      | PORTABLE DRILL        | 27.70               |
| HEWLETT-PACKARD      | 5254A    | FREQUENCY             | 925.00              |
| FLUKE                | 8842A    | DIGITAL MULTIMETER    | 1,395.00            |
| BELL & HOWELL        | NONE     | CABINET               | 824.00              |
| GENRAD               | 1409-T   | STD. CAPACITOR        | 85.00               |
| PAROSCIENTIFIC       | 230D     | PRESSURE SENSO        | 2,050.00            |
| PRINCETON            | MAX12    | DISPLAY, COMPUTER     |                     |
| UNHOLTZ DICKIE       | 106      | VIBRAT.CAL.SYS        | 39,594.00           |
| HEWLETT PACKARD      | 8402A    | PWR. MTR CALIB        | 475.00              |
| AMPEX                | TU-40    | FLUTTER METER         | 2,788.34            |
| TEKTRONIX            | CA       | PRE AMP               | 260.00              |
| SIMPSON              | 260      | VOM                   | 63.45               |
| B & K INSTRUMENTS IN | 2645S    | MICROPHONE AMP        | 996.00              |
| D & H INSTRUMENT     | 5306     | DEAD WEIGHT TESTER    | 29,046.00           |
| SEAGATE              | ST4766N  | DISC DRIVE            | 1,829.00            |
| KISTLER              | 808K2    | CAL. STD.             | 500.00              |
| FLUKE                | 80E      | VOLT DIVIDER          | 225.00              |
| FLUKE                | 8000A    | DIG MULTIMETER        | 290.03              |
| DEC                  | VS21VP2  | COMPUTER              | 25,000.00           |
| DEC                  | VR290-DA | MONITOR               | 5,000.00            |
| B & K                | 2619     | PRE-AMP               | 600.00              |
| B & K                | 2807     | POWER SUPPLY          | 900.00              |

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|----------------------|------------|--------------------|------------------|
| B & K                | 2807       | POWER SUPPLY       | 900.00           |
| B & K                | 4136       | MICROPHONE         | 900.00           |
| FLUKE                | 9900       | INTERFACE POD      | 4,490.00         |
| LYNX                 | 600        | PRINTER TESTER     | 495.00           |
| ELECTRONIC DEVELOPME | VS-111N    | VOLT STANDARD      | 845.00           |
| L & N                | 4050B      | STD. RESISTOR      | 80.00            |
| DOLCH INSTS.         | 64300      | ANALYZER, LOGIC    | 14,335.50        |
| TEKTRONIX            | 7A19       | AMPLIFIER          | 700.00           |
| MG INDUSTRIES        | 65000-69   | HAND TRUCK         | 140.00           |
| HEWLETT-PACKARD      | 2623A      | MONITOR W/KEYBOARD |                  |
| IRWIN                |            | FINGER BRAKE       | 268.00           |
| KEITHLEY             | 195A       | DIG MULTIMETER     | 1,315.20         |
| KEITHLEY             | 130A       | DIG MULTIMETER     | 113.90           |
| GENRAD               | 1409-M     | STD. CAPACITOR     | 85.00            |
| EPSON                | FX850      | PRINTER            | 549.00           |
| B & K                | 2619       | PRE-AMP            | 600.00           |
| HEWLETT PACKARD      | 721A       | POWER SUPPLY       | 147.40           |
| GENRAD               | 1482L      | STD INDUCTOR       | 150.00           |
| BALLANTINE           | 6125A      | CALIBRATOR         | 1,837.50         |
| B & K INSTRUMENTS IN | 2804       | POWER SUPPLY       | 160.00           |
| SENCORE              | LC53       | CAPACITOMETER      | 805.50           |
| HEWLETT PACKARD      | 5302A      | COUNTER PLUGON     | 272.25           |
| KISTLER              | 561T       | AMPLIFIER          | 840.00           |
| NICOLET              | 204A       | CONTROLLER         | 3,567.00         |
| TEKTRONIX            | TM504      | POWER MODULE       | 180.00           |
| HEWLETT PACKARD      | 7045A      | X Y PLOTTER        | 2,103.75         |
| TEKTRONIX            | 323        | OSCILLOSCOPE       | 1,354.50         |
| TEKTRONIX            | WR501      | WORD RECOGNIZ.     | 1,451.25         |
| FLUKE                | 8000A      | DIG MULTIMETER     | 362.78           |
| B & K INSTRUMENTS IN | 510        | TRANS. TESTER      | 110.00           |
| GENRAD               | 1419A      | DECADE CAP.        | 180.00           |
| ROCKWELL             | 17612      | DRILL PRESS        | 398.50           |
| GENRAD               | 104T       | STD RESISTANCE     | 750.00           |
| B & K                | 4134       | MICROPHONE         | 908.00           |
| FLUKE                | 77         | MULTIMETER, DIG.   | 116.10           |
| FLUKE                | 77         | MULTIMETER, DIG.   | 116.10           |
| MENSOR               | 11900      | PRESSINDICATOR     | 2,780.00         |
| SUN                  | 3/140      | COMPUTER           | 66,162.00        |
| GENERAL RESISTANCE   | DAS66AX    | POWER SUPPLY       | 1,293.50         |
| TEKTRONIX            | 323        | OSCILLOSCOPE       | 1,354.50         |
| B & K INSTRUMENTS IN | 2804       | POWER SUPPLY       | 988.95           |
| HEWLETT-PACKARD      | 9153C      | DISK DRIVE         | 1,672.00         |
| MOTOROLA             | HCN1036E90 | CONTROLLER         | 512.00           |
| TEKTRONIX            | 0670625    | DETECTOR           | 120.00           |
| KISTLER              | 303A       | ACCELEROMETER      | 500.00           |
| TRYGON               | HR405B     | POWER SUPPLY       | 573.00           |
| AMPEX                | AA620      | AMP. SPEAKER       | 240.00           |
| WEATHERTRONICS       | 5021       | HYGROTHERMOGRA     | 365.00           |
| HEWLETT PACKARD      | 3594A      | OSCILLATOR, SWEEP  | 1,640.00         |
| ROCKWELL             | 25-709     | LATHE              | 1,661.35         |
| CRONN                |            | CONT ALT CHAMB     | 250.00           |
| B S                  | 212RS      | DEPTH GAGE         | 75.00            |

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|----------------------|------------|----------------------|------------------|
| MOBILE-TRONI         | MO-07      | SCOPE CART           | 178.00           |
| B & K INSTRUMENTS IN | 2801       | POWER SUPPLY         | 321.75           |
| B & K                | 2639       | PRE AMP              | 593.00           |
| TEKTRONIX            | 7A22       | AMPLIFIER            |                  |
| IBM                  | 5151       | DISPLAY              |                  |
| SIMPSON              | 160        | METER                | 60.72            |
| TEXAS INSTRUMENTS    | 6613RX3    | PULSE GEN            | 950.00           |
| MENSOR               | 11900      | PRESS.INDICAT.       | 2,489.00         |
| HEWLETT PACKARD      | 651A       | OSCILLATOR           | 613.85           |
| HEWLETT PACKARD      | 495A       | AMPLIFIER            | 2,916.81         |
| SIMPSON              | 260        | VOM                  | 89.00            |
| HEWLETT PACKARD      | 431C       | POWER METER          | 475.00           |
| TRIPLETT             | 310        | VOLT OHM METER       | 69.00            |
| TEKTRONIX            | 1480C      | MONITOR              | 2,318.30         |
| FUJITSU              | FKB2930    | KEYBOARD, COMPUTER   | 99.00            |
| KROHN HITE           | 6500       | PHASEMETER           | 2,000.00         |
| KROHN HITE           | 6500       | PHASEMETER           | 1,935.15         |
| B & K INSTRUMENTS IN | 2426       | VOLTMETER AC         | 1,600.00         |
| STANDARD             | MCH-4095N  | MONITOR              | 470.00           |
| SIMPSON              | 260-6      | VOM                  | 60.28            |
| SIMPSON              | 260-6      | VOM                  | 60.28            |
| L & N                | 4214B      | RESISTOR             | 2,327.00         |
| HEWLETT PACKARD      | 461        | AMPLIFIER            | 352.05           |
| KEITHLEY             | 130        | DMM                  | 115.00           |
| NASA                 | 3564345    | VACUUM CHAMBER       | 250.00           |
| MKS                  | 2155       | SIGNAL CONDIT        | 700.00           |
| HEWLETT PACKARD      | 651B       | OSCILLATOR           | 654.00           |
| WALLACE & TIERNAN    | FA145      | PRESS GAUGE          | 280.00           |
| HEWLETT PACKARD      | 6025       | EXTENDER BOARD       | 100.00           |
| TEKTRONIX            | 475        | OSCILLOSCOPE         | 2,822.70         |
| UVP                  | C-25       | ERASE EPROM          | 319.00           |
| TELEDYNE             | CPR-1A     | READOUT, POWER SUPPL | 695.00           |
| TEKTRONIX            | 3A1        | PLUG IN UNIT         | 410.00           |
| KEITHLEY             | 515        | RESIST BRIDGE        | 2,692.15         |
| KEITHLEY             | 130        | DMM                  | 115.00           |
| SMITH MFG            | SM02805    | PRINTER STAND        | 107.50           |
| B & K INSTRUMENTS IN | 2619       | PREAMPLIFIER         | 442.00           |
| FUJITSU              | FKB2930    | KEYBOARD, COMPUTER   | 99.00            |
| MAGNAVOX             | 7BM623-074 | DISPLAY, COMPUTER    | 500.00           |
| EB WATT              | 38401      | CLINOMETER           | 220.00           |
| GENRAD               | 874G20     | G20 ATTENUATOR       | 30.00            |
| ARRIFLEX             |            | TORQUE GAGE          | 50.00            |
| UNHOLTZ DICKIE       | 608PS-1    | PWR. SUP.            | 425.00           |
| COMPUTER INST. CORP. | 505        | POTENTIOMETER        | 650.00           |
| TEKTRONIX            | K          | PLUG IN AMP          | 147.00           |
| SIMPSON              | 261        | VO MILLIAMMETR       | 68.40            |
| FLUKE                | 8300A      | DIGITAL VOLTMETER    | 2,095.00         |
| HI-TEK               | RT-101     | KEYBOARD             | 90.00            |
| B & K INSTRUMENTS IN | 2426       | VOLTMETER AC         | 1,600.00         |
| TRUE TIME            | 468DC      | DIGITAL CLOCK        | 2,600.00         |
| HEWLETT PACKARD      | 5334A      | COUNTER, FREQUENCY   | 4,568.70         |
| IWATSU               | DS-6121A   | OSCILLOSCOPE, DIGITA | 4,479.24         |

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| Manufacturer Name    | Model      | Description          | Acquistion Cost |
|----------------------|------------|----------------------|-----------------|
| IBM                  | 8512-001   | MONITOR              | 375.00          |
| FLUKE                | 335D       | VOLT CALIBRA         | 3,584.15        |
| TEKTRONIX            | SC504      | OSCILLOSCOPE         | 2,557.00        |
| EPSON                | MX80FT     | PRINTER              | 592.00          |
| HEWLETT PACKARD      | 6114A      | POWER SUPPLY         | 1,152.00        |
| TEKTRONIX            | 7D01F2     | LOGIC ANALYZER       | 5,272.88        |
| SHIELD-ARC           | SAE300     | WELDER               | 500.00          |
| APPLE                | M0401      | MONITOR              | 659.00          |
| BELL & HOWELL        | MRS2064    | CABINET, FILE, MICRO | 824.00          |
| IWATSU               | SS-5710D   | OSCILLOSCOPE         | 1,398.99        |
| IWATSU               | SS-5711D   | OSCILLOSCOPE         | 1,749.62        |
| COMPUADD             | 286        | COMPUTER             | 1,583.00        |
| HEWLETT PACKARD      | 400EL      | VOLTMETER AC         | 327.45          |
| TEKTRONIX            | 545B       | OSCILLOSCOPE         | 1,635.45        |
| FLUKE                | 8842A/05   | DIGITAL MULTIMETER   | 1,145.00        |
| HEWLETT PACKARD      | 3457A      | MULTIMETER, DIGITAL  | 2,731.00        |
| RCA                  | 1005/01    | T V CAMERA           | 596.00          |
| HEWLETT PACKARD      | 5265A      | DIG. VOLTMETER       | 825.00          |
| TRIPLETT             | 310        | VOLT OHM METER       | 69.00           |
| FLUKE                | 77         | DIGITAL MULTIMETER   | 130.00          |
| HEWLETT PACKARD      | 3312A      | FUNCTION GENERATOR   | 1,619.75        |
| ROSEMOUNT            | 162D       | TEMPERATURE STANDARD | 2,626.00        |
| FIRTH                | 61-7700    | ONE CYL CART         | 21.50           |
| SELLSTROM            | 243R       | HELMET WELDING       | 10.00           |
| NEC                  | JC1401P3A  | MONITOR, COMPUTER    | 585.00          |
| DREMEL               | 380-S      | MOTO TOOL KIT        | 60.00           |
| ULTIMATE COMPUTER SU | NONE       | MICROMANAGER WORKSTA | 130.55          |
| MITSUBISHI           |            | DISPLAY, COMPUTER    | 469.00          |
| FLUKE                | 407D       | POWER SUPPLY         | 360.00          |
| WELCH                | 1402B      | VAC PUMP             | 405.00          |
| HONDA                | EX5500     | GASOLINE GENERATOR   | 2,293.00        |
| COMPUADD             | 286        | MICRO COMPUTER       | 1,128.00        |
| FLUKE                | 853A       | DC VOLTMETER         | 480.15          |
| HOFMAN               | NONE       | DEWAR                | 500.00          |
| GENRAD               | 1382       | GENERATOR            | 608.85          |
| GENRAD               | W5MT3A     | VARIAC               | 95.00           |
| SHUGART              | SA809      | F D EXERCISER        | 379.00          |
| SIMPSON              | 160        | METER                | 60.72           |
| BELL & HOWELL        | 4-462-5    | DIG MANOMETER        | 4,225.00        |
| HEWLETT PACKARD      | 9835A      | CALCULATOR           | 9,553.00        |
| MOTOROLA             | T99VB-004W | RADIO, FM            | 2,332.78        |
| HEWLETT PACKARD      | 3440A      | DIG. VOLTMETER       | 1,167.49        |
| KEITHLEY             | 130        | DMM                  | 115.00          |
| HEWLETT PACKARD      | 5300B      | FREQ. COUNTER        | 792.00          |
| GENRAD               | 1482-N     | STD. INDUCTOR        | 110.00          |
| B & K INSTRUMENTS IN | 2804       | POWER SUPPLY         | 962.00          |
| HEWLETT PACKARD      | 6102A      | PWR SUP.             | 362.00          |
| SIMPSON              | 260-6      | VOM                  | 60.28           |
| HEWLETT PACKARD      | 5262A      | TIME INT. UNIT       | 375.00          |
| WELCH                | 1402       | VACUUM PUMP          | 420.00          |
| GATEWAY              | PMV1448    | DISPLAY              | 300.00          |
| GATEWAY              | 386/25     | COMPUTER             | 2,200.00        |

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| Manufacturer Name    | Model      | Description          | Acquisition Cost |
|----------------------|------------|----------------------|------------------|
| TEKTRONIX            | 149A       | GENERATOR            | 3,977.00         |
| TEKTRONIX            | TM506      | POWER MODULE         | 440.00           |
| EPSON                | FX86E      | PRINTER, DIGITAL     | 386.00           |
| HEWLETT PACKARD      | 7030A      | PLOTTER XY           | 1,905.00         |
| CLAROSTAT            | 240C       | DECADERESISTOR       | 350.00           |
| HEWLETT PACKARD      | 339A       | DISTORTION ANA       | 1,877.00         |
| TEKTRONIX            | 335        | OSCILLOSCOPE         | 2,104.31         |
| PAROSCIENTIFIC       | 230-DS     | PRESS PICKUP         | 2,400.00         |
| GENRAD               | 1986       | SOUND CALIBRA.       | 855.95           |
| TEKTRONIX            | 221        | OSCILLOSCOPE         | 1,612.80         |
| B & K INSTRUMENTS IN | 2619       | PREAMPLIFIER         | 442.00           |
| DSO-THERM            | 54815      | AIR COND.            | 520.00           |
| B & K INSTRUMENTS IN | 4133       | MICROPHONE           | 195.00           |
| CONRAC               | SNA/7/C    | MONITOR              | 1,005.00         |
| ANTLAB               | 7207       | MODULATOR            | 425.00           |
| TERMALINE            | 67         | WATTMETER            | 275.00           |
| HEWLETT PACKARD      | 5254A      | CONVERTER FREQ       | 1,550.00         |
| MOTOROLA             | H99SS+008H | TRANSCEIVER, RADIO   | 1,974.71         |
| TEKTRONIX            | 604        | CRT DISPLAY          | 916.65           |
| B & K INSTRUMENTS IN | 4134S      | MICROPHONE           | 300.00           |
| MIKRON               | M300       | IFRARED RADIATION SO | 7,520.00         |
| COMPUADD             | 286        | MICRO COMPUTER       | 1,663.00         |
| DATAMETRICS          | 1174A5A    | MANOMETER            | 1,477.25         |
| HEWLETT PACKARD      | 400E       | AC VOLTMETER         | 287.12           |
| HEWLETT PACKARD      | 400E       | AC VOLTMETER         | 287.12           |
| MAX TECH             | PB64       | BUFFER               | 120.00           |
| EPSON                | FX100      | PRINTER              | 769.00           |
| HEWLETT PACKARD      | 5245L      | COUNTER              | 2,961.65         |
| VALHALLA             | 2724A      | RESISTANCE CALIB.STA | 5,045.00         |
| DATA MEASUREMENTS    | 6275       | FM TEST SET          | 200.00           |
| TEK                  | 7A22       | DIFF AMP PLUG IN     | 1,762.25         |
| SMITH MFG            | SM02805    | PRINTER STAND        | 107.50           |
| FLUKE                | 9010A      | ANALYZER             | 4,022.40         |
| TRYGON               | SHR4015    | PWR. SUP.            | 199.00           |
| SYSTRON DONNER       | 8150       | GENERATOR            | 3,710.25         |
| TEKTRONIX            | 321A       | OSCILLOSCOPE         | 911.50           |
| TEKTRONIX            | AF501      | FILTER               | 782.40           |
| SORENSEN             | QB28-8     | POWER SUPPLY         | 492.00           |
| BELL & HOWELL        | 117226     | GALVO DRIVEAMP       | 875.00           |
| L & N                | 4210-B     | STD RESISTOR         | 1,100.00         |
| TEKTRONIX            | 0670521    | PLUG IN              | 425.00           |
| FLUKE                | 853A       | DC VOLTMETER         | 480.15           |
| HEWLETT PACKARD      | 400E       | VOLTMETER AC         | 327.45           |
| HEWLETT PACKARD      | 82161A     | RECORDER             | 467.50           |
| HEWLETT PACKARD      | 82162A     | PRINTER              | 420.75           |
| HEWLETT PACKARD      | 350D       | ATTENUATOR           | 140.00           |
| GENRAD               | 1521B      | RECORDER             | 1,155.00         |
| VOLUMETRICS          | V-1R       | CONTROLLER           | 250.00           |
| FLOW DYNE            | N160031    | SONIC NOZZLE         | 250.00           |
| FLOW DYNE            | N160047    | SONIC NOZZLE         | 250.00           |
| L & N                | 4323B      | RESISTANCE           | 3,205.00         |
| FLUKE                | 885A       | DC DIFF VOLT         | 1,060.00         |

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|----------------------|------------|----------------------|------------------|
| HEWLETT PACKARD      | 400EL      | VOLTMETER AC         | 327.45           |
| DATAMETRICS          | 1015D5C    | SIG CONDITIONE       | 1,296.75         |
| HEWLETT PACKARD      | 652A       | FREQ. OSCILL.        | 999.90           |
| FLUKE                | 52 K/J     | DIGITAL THERMOMETER  | 169.00           |
| B & K INSTRUMENTS IN | 4134S      | MICROPHONE           | 300.00           |
| HEWLETT PACKARD      | 400E       | AC VOLTMETER         | 287.12           |
| HEWLETT PACKARD      | 5261A      | VIDEO AMP            | 326.83           |
| NEFF                 | 018        | AMP. RACK            | 271.60           |
| HEWLETT PACKARD      | 6255A      | POWER SUPPLY         | 641.50           |
| FXR INC.             | Y410A      | FREQ. METER          | 210.00           |
| B & K INSTRUMENTS IN | 2426       | VOLTMETER            | 1,657.00         |
| NEIL BROWN           | ATB1250    | TEMP. BRIDGE         | 30,250.00        |
| TEKTRONIX            | FG501      | FUNCT GEN            | 388.00           |
| B & K INSTRUMENTS IN | 2607       | SOUND LEVEL ME       | 4,346.88         |
| TEKTRONIX            | DC503      | FREQ METER           | 703.25           |
| NASA                 | 15515-1    | PWR RES BANK         | 100.00           |
| GSE                  |            | LOCKER               | 41.40            |
| WELCH                | 1402       | VACUUM PUMP          | 900.00           |
| TEKTRONIX            | TU7        | PRE AMP              | 200.00           |
| STANDARD             | MCH-4095N  | MONITOR              | 470.00           |
| TEKTRONIX            | 013013     | EXTENDER BOARD       | 20.00            |
| HELICOIL             | 10-24      | HELICOIL SET         | 24.40            |
| HELICOIL             | 10-32      | HELICOIL SET         | 27.20            |
| HEWLETT PACKARD      | 940A       | FREQ. DOUBLER        | 1,511.81         |
| DATRON               | 4000A      | VOLT. CALIBRA        | 603.00           |
| SIMPSON              | 461-2      | MULTIMETER           | 152.00           |
| HEWLETT PACKARD      | 8553B      | SPEC ANALYZER        | 3,540.50         |
| HEWLETT PACKARD      | 651A       | TESTOSCILLATOR       | 609.00           |
| TEKTRONIX            | 0130055    | PLUG-IN EXT          | 40.10            |
| HEWLETT-PACKARD      | 3498A      | EXTENDER, OPTION HOL | 9,724.00         |
| B & K INSTRUMENTS IN | 2425       | RMS VOLTMETER        | 724.80           |
| TEKTRONIX            | 5B13N      | TIME BASE            | 92.15            |
| AMERICAN INSTRUMENT  | TURBO      | COMPUTER, PERSONAL   | 2,155.00         |
| STANDARD             | 286        | PERSONAL COMPUTER    | 1,128.00         |
| PSI                  | PSA-1      | ANALYZER, PRESSURE S | 1,700.00         |
| SIMPSON              | 260-6      | VOM                  | 60.28            |
| B & K INSTRUMENTS IN | 4142       | CALIBRATOR           | 1,032.00         |
| DATA PRECISION       | 938        | CAPACITANCE METER    | 225.00           |
| BIDDLE               | 72-6346    | RESISTANCE, BOX, DEC | 2,220.00         |
| GENRAD               | 874G20     | G20 ATTENUATOR       | 30.00            |
| TEKTRONIX            | 545B       | OSCILLOSCOPE         | 1,550.00         |
| CORNELL-DUBILIER     | CDB3       | DECADE CAP.          | 25.00            |
| TEKTRONIX            | 177        | TEST FIXTURE         | 950.00           |
| HEWLETT PACKARD      | 339A       | ANALYZER             | 2,484.99         |
| TEKTRONIX            | 7A16A      | WB AMPLIFIER PLUG IN | 1,334.75         |
| YELLOW SPRINGS INSTR | NONE       | FREEZE POINT, TEMP.  | 4,500.00         |
| HEWLETT PACKARD      | 203A       | AUDIO SIG GEN        | 1,259.24         |
| FLUKE                | 853A       | DC VOLTMETER         | 480.15           |
| FLUKE                | 853A       | DC VOLTMETER         | 480.15           |
| L & N                | 7421       | PH METER             | 988.00           |
| MOTOROLA             | H99SS+008H | TRANSCEIVER, RADIO   | 1,974.71         |
| FLUKE                | 77         | DIGITAL MULTIMETER   | 107.10           |

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| Manufacturer Name    | Model      | Description          | Acquistion Cost |
|----------------------|------------|----------------------|-----------------|
| HONEYWELL            | 1858       | CHART RECORDER, FIBE | 19,575.00       |
| DATA DEVICES         | 3336-11    | ANALYZER             | 2,995.00        |
| FLUKE                | 8520A      | DIG. MULTIMETER      | 2,845.25        |
| HOLT                 | 6A         | THER TRAN VOLT       | 889.00          |
| B & K INSTRUMENTS IN | 4133/S     | MICROPHONE           | 447.00          |
| B & K INSTRUMENTS IN | 4133/S     | MICROPHONE           | 447.00          |
| TEKTRONIX            | TG501      | TIME MARK GENERATOR  | 2,489.00        |
| HEWLETT PACKARD      | 3478A      | DIG MULTIMETER       | 1,248.00        |
| SAMSUNG              | SM12FFA7   | MONITOR              | 95.00           |
| DATA PRECISION       | 245        | DIG MULTIMETER       | 286.15          |
| MAX TECH             | PB64       | BUFFER PRINTER       | 99.00           |
| KEYTRONIC            | EO3435     | KEYBOARD             | 85.00           |
| PACKARD BELL         | 1200       | MODEM                | 89.00           |
| SIMPSON              | 260        | VOM                  | 89.00           |
| WEINSCHEL            | 4310A/K    | SWEEPER SYSTEM       | 27,930.00       |
| FLUKE                | 8050A      | DIGITAL MULTIMETER   | 374.52          |
| FLUKE                | 23         | DIGITAL MULTIMETER   | 143.10          |
| PC'S LIMITED         | AT110      | COMPUTER, PERSONAL   | 1,200.00        |
| COMPUADD             | 286        | MICRO COMPUTER       | 1,128.00        |
| NEWHERM              |            | ENGRAVING MACH       | 368.50          |
| TRIPLETT             | 310        | VOLT OHM METER       | 85.00           |
| TEKTRONIX            | 3S76       | DUAL TRACE           | 1,100.00        |
| GENERAL ELECTRIC     | 33         | STANDARD LAMP        | 50.00           |
| FLUKE                | 343A       | VOLT CALIB           | 1,935.15        |
| SENSITIVE RESEARCH   | ESD        | VOLTMETER DC         | 235.71          |
| HEWLETT PACKARD      | 3441A      | RANGE SELECTOR       | 41.50           |
| RFL                  | 1295A      | FLUXMETER            | 623.47          |
| HELICOIL             | 4-40       | HELICOIL SET         | 38.15           |
| EPSON                | FX286E     | PRINTER              | 530.00          |
| EPSON                | FX1050     | PRINTER, DIGITAL     | 471.00          |
| FUJITSU              | M2361A     | DISC DRIVE           | 8,375.00        |
| FLUKE                | 8300A      | DIGITAL VOLT         | 1,639.30        |
| SPECTRAL DYNAMICS    | SD105C     | SERVO AMP            | 2,174.25        |
| 3M COMPANY           | 610A       | GENERATOR            | 940.80          |
| 3M COMPANY           | 6100A      | HARMONIC ANALY       | 3,643.20        |
| FLUKE                | 52         | DIGITAL THERMOMETER  | 170.10          |
| TEKTRONIX            | 7904A      | OSCILLOSCOPE         | 10,431.00       |
| HITACHI              | V1060      | PORTABLE OSCILLOSCOP | 1,276.00        |
| NOBATRON             | E65        | POWER SUPPLY         | 199.93          |
| HELICOIL             | 3/8-24     | HELICOIL SET         | 30.50           |
| MOTOROLA             | 01-P079014 | DISPLAY CONTROLLER   | 42,682.00       |
| HEWLETT PACKARD      | 200AB      | OSCILLATOR           | 171.00          |
| HEWLETT PACKARD      | 400E       | AC VOLTMETER         | 287.12          |
| TEKTRONIX            | 190B       | CONST AMP GEN        | 330.00          |
| SORENSEN             | 610B       | NOBATRON             | 825.00          |
| RUSKA                | 2417706    | PRESSURE CELL        | .00             |
| RUSKA                | 2416704    | PRES INDICATOR       | 1,465.00        |
| B & K INSTRUMENTS IN | 4152       | ARTIFICAL EAR        | 195.00          |
| TEKTRONIX            | 111        | PULSE GENERAT        | 631.00          |
| TRIPLETT             | 310        | VOLT OHM METER       | 69.00           |
| KOEP                 | VTS6001-1- | VOLTAGE STANDARD     | 1,990.00        |
| GATEWAY              | 386/25     | COMPUTER             | 2,200.00        |



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|----------------------|------------|----------------------|------------------|
| IBM                  | 4224-201   | PRINTER              | 2,520.00         |
| TEKTRONIX            | 067-053    | SIG GENERATOR        | 1,550.00         |
| TEKTRONIX            | 454A       | OSCILLOSCOPR         | 3,104.00         |
| CLAROSTAT            | 240C       | DECADE RESIST        | 72.00            |
| SYSTRON DONNER       | TPZC48     | POWER SUPPLY         | 145.00           |
| B & K INSTRUMENTS IN | 4134/S     | MICROPHONE           | 447.00           |
| KEPCO                | SC32-1     | POWER SUPPLY         | 610.05           |
| WAVETEK              | 4708       | CALIBRATION STANDARD | 22,900.00        |
| DATA PRECISION       | 5740       | COUNTER              | 388.80           |
| ARRIFLEX             |            | APERATURE FIXT       | 10.00            |
|                      |            | READOUT              | 175.00           |
| SAMSUNG              | SM-12SFA7  | MONITOR              | 95.00            |
| 3M                   | 7540       | READER/PRINTER       | 3,889.00         |
| DO ALL               | NONE       | TABLE                | 660.00           |
| COMPUADD             | 286        | COMPUTER             | 1,583.00         |
| ESI                  | 801        | DETECTOR DC          | 1,314.35         |
| RFL                  | 990        | MAGNETRCATER         | 753.75           |
| TEKTRONIX            | 7D01F2     | LOGIC ANALYZER       | 5,272.88         |
| TEKTRONIX            | 7A26       | PLUG IN              | 1,388.00         |
| TEKTRONIX            | SG504      | SIGNAL GEN           | 2,215.00         |
| HEWLETT PACKARD      | 3478A      | MULTIMETER, DIGITAL  | 940.27           |
| F & P                | 10C1516DCA | FLOWMETER, TURBINE   | 1,600.00         |
| ONO SOKKI            | CF350B     | ANALYZER, SPECTRUM   | 16,530.00        |
| ALUMA TOWER          | TM51-20T11 | TRAILER, TOWER       | 8,270.00         |
| ALUMA TOWER          | TM51-20T11 | TRAILER, TOWER       | 8,270.00         |
| GENRAD               | W5MT3A     | VARIAC               | 95.00            |
| RUSKA                | 2416       | NULL METER           | 2,000.00         |
| SHALLCROSS           | 6863       | DECADE RES           | 180.00           |
| B & K INSTRUMENTS IN | 4133/S     | MICROPHONE           | 447.00           |
| HEWLETT PACKARD      | 6459A      | POWER SUPPLY         | 2,618.55         |
| FIRTH                | 314-27     | TWO CYL CART         | 41.50            |
| FASTAK               | 1 INCH     | LENS                 | 189.00           |
| GENRAD               | 1482-J     | STD. INDUCTOR        | 110.00           |
| MENSOR               | 11900      | PRESS IND.           | 2,156.50         |
| TEKTRONIX            | 2215       | OSCILLOSCOPE         | 1,344.00         |
| BALLANTINE           | 6125       | SCOPE CALIBRAT       | 6,500.00         |
| RFL                  | 2500350    | CAPACITOR UNIT       | 600.00           |
| DATA PRECISION       | 3500       | DIG MULTIMETER       | 965.15           |
| HEWLETT PACKARD      | 8402B      | CALIBRATOR           | 478.03           |
| HEWLETT PACKARD      | 3457A      | MULTIMETER, DIGITAL  | 2,674.35         |
| HEWLETT PACKARD      | 3457A      | MULTIMETER, DIGITAL  | 2,646.00         |
| MENSOR               | 11900-402F | INDICATOR, PRESS., D | 3,200.00         |
| HI-TEK               | RT-101     | KEYBOARD             | 90.00            |
| IBM                  | 8570       | COMPUTER             | 3,261.00         |
| SIMPSON              | 260        | MULTIMETER           | 50.00            |
| HEWLETT PACKARD      | 5245L      | FREQ COUNTER         | 2,697.75         |
| TEKTRONIX            | T922       | OSCILLOSCOPE         | 1,301.29         |
| TEKTRONIX            | T922       | OSCILLOSCOPE         | 1,301.29         |
| TEKTRONIX            | SG503      | SINE WAVE GENERATOR  | 2,280.00         |
| IWATSU               | SS-5710D   | OSCILLOSCOPE         | 1,398.99         |
| FUJITSU              | FKB2930    | KEYBOARD, COMPUTER   | 99.00            |
| COMMODORE            | 4032N      | CALCULATOR           | 1,065.00         |

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|----------------------|------------|----------------------|--------------------|
| EBERLINE             | PAC15A     | ALPHA COUNTER        | 654.00             |
| B & K INSTRUMENTS IN | 830        | CAPACITA METER       | 300.00             |
| SIMPSON              | 260        | VOM                  | 63.00              |
| VIGOR                | BN-225     | WTCHMKRS BENCH       | 140.00             |
| TEKTRONIX            | G          | PLUG IN              | 235.00             |
| FLUKE                | 77         | DIGITAL MULTIMETER   | 130.00             |
| PYROMETER IN         | PHOTO 2    | PYROMETER            | 6,217.75           |
| TELEVIDEO            | 925        | COMPUTER TERMINAL DI | 600.00             |
| DELL                 | MI         | MONITOR              | 350.00             |
| RUSS BASSETT         | NONE       | CABINET              | 575.00             |
| SYSTRON DONNER       | 8120       | TIME CODE GEN        | 3,295.00           |
| B & K INSTRUMENTS IN | 2619       | PREAMPLIFIER         | 442.00             |
| EPSON                | FX86E      | DIGITAL PRINTER      | 386.00             |
| CORNELL-DUBILIER     | CDA5       | DECADE CAP.          | 26.00              |
| GSE                  |            | LOCKER               | 41.40              |
| DATA ROYAL           | F321A      | OSCILLATOR           | 544.75             |
| PACE                 | 151        | DESOLDERING STATION  | 1,375.00           |
| EPSON                | FX850      | PRINTER              | 367.00             |
| HEWLETT PACKARD      | 5254B      | FREQ CONVERTER       | 827.40             |
| F & P                | 10A2735    | FLOWMETER            | 157.00             |
| L & N                | 8163       | THERMOMETER          | 1,000.00           |
| GENRAD               | 103T       | R T STANDARD         | 275.00             |
| HEWLETT PACKARD      | 350D       | ATTENUATOR           | 160.00             |
| GATEWAY              | PMV1448    | DISPLAY              | 300.00             |
| GATEWAY              | 386/25     | COMPUTER             | 2,200.00           |
| TEKTRONIX            | 1S1        | SAMPLING UNIT        | 1,105.50           |
| EVEREX               | MD2400     | MODEM                | 187.00             |
| SYSTRON DONNER       | 8120       | TIME CODE GEN        | 3,250.00           |
| DATA PRECISION       | 3500       | DIG MULTIMETER       | 965.15             |
| DATA PRECISION       | 245        | DIG MULTIMETER       | 280.25             |
| GENRAD               | 1521B      | GRAPH LEV REC        | 1,155.00           |
| HEWLETT PACKARD      | 310A       | ANALYZER             | 2,806.65           |
| BAUSCH-LOMB          | NONE       | MICROSCOPE           | 626.40             |
| B & K INSTRUMENTS IN | 4133/S     | MICROPHONE           | 447.00             |
| OPTRONIC LAB         |            | POWER SUPPLY         | 1,005.00           |
| B & K INSTRUMENTS IN | 2426       | VOLTMETER AC         | 1,600.00           |
| SIMPSON              | 260        | MULTIMETER           | 50.00              |
| COMPUADD             | 286        | COMPUTER             | 1,583.00           |
| MODCOMP              | 7863-E1    | DIG. COMPUTER        | 40,795.00          |
| TELEVIDEO            | 920C       | TERMINAL             | 794.00             |
| ANDERSON JACOBEN     | AJ1234     | COUPLER              | 798.00             |
| PACKARD BELL         | 1200       | MODEM                | 89.00              |
| EBERLINE             | S94-1      | PLUTO ALPHA SD       | 300.00             |
| L & N                | 10 OHM     | STD RESISTER         | 70.00              |
| KEITHLEY             | 10/8       | HI MEG RES STD       | 132.50             |
| HEWLETT PACKARD      | 3455A      | VOLTMETER            | 3,168.00           |
| FLUKE                | 23         | DIGITAL MULTIMETER   | 143.10             |
| TEKTRONIX            | 7A19       | PLUG IN              | 2,859.50           |
| M. G. INDUSTRIES     | 65000049-5 | PRESSURE REGULATOR   | 225.00             |
| DATAMETRICS          | 1015D5C    | SIG CONDITIONE       | 1,296.75           |
| DATAMETRICS          | 1015D5C    | SIG CONDITIONE       | 1,296.75           |
| FLUKE                | 931        | TRUE RMS VOLT        | 1,256.15           |

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|----------------------|------------|----------------------|------------------|
| TEKTRONIX            | K          | PLUG IN AMP          | 147.00           |
| FLUKE                | 8800A      | DIG MULTIMETER       | 955.45           |
| HONEYWELL            | 320        | ANA INPUT PLOT       | 1,353.15         |
| HEWLETT PACKARD      | 11098-A    | LEVEL DETECTOR       | 31.12            |
| GSE                  |            | CONSOLE              | 50.00            |
| HEWLETT PACKARD      | 608D       | VHF SIG. GEN.        | 1,300.00         |
| FLUKE                | 332D       | POWER SUPPLY         | 6,388.75         |
| HEWLETT PACKARD      | 6102A      | PWR SUPPLY           | 362.15           |
| HEWLETT PACKARD      | 865B       | POWER SUPPLY         | 169.00           |
| INTERNATIONAL BUSINE | 1390702    | KEYBOARD             | 200.00           |
| TEC                  | F10-55     | PRINTER, DIGITAL     | 1,349.00         |
| COMPUTER INTERNATION | 111        | POTENTIOMETER        | 380.00           |
| PC'S LIMITED         | AT110      | COMPUTER, PERSONAL   | 1,200.00         |
| HEWLETT PACKARD      | 41CV       | CALCULATOR, ELECTRON | 175.00           |
| STANDARD             | MCH-4095N  | MONITOR              | 470.00           |
| MAX TECH             | MS-401     | AUTO DATA SWITCH     | 239.00           |
| PC LIMITED           | VC3        | MONITOR              | 1,700.00         |
| HONEYWELL            | 1352       | WHEATSTONE BRI       | 195.00           |
| TEKTRONIX            | 3A1        | PLUG-IN              | 410.00           |
| B & K INSTRUMENTS IN | 2426       | VOLTMETER AC         | 1,600.00         |
| IWATSU               | SS-5711D   | OSCILLOSCOPE         | 1,749.62         |
| AMTHOR               | 460        | TESTER, DEAD WEIGHT  | 500.00           |
| FTS                  | 4060       | FREQUENCY STANDARD   | 31,948.00        |
| KEITHLEY             | 220        | CURRENT SOURCE       | 3,067.00         |
| TRANSMATICS          | 2632CC-44S | DIGITAL ANGLE INDICA | 3,132.00         |
| FLUKE                | 77         | DIGITAL MULTIMETER   | 138.00           |
| CEL INSTRUMENTS      | 213        | NOISE GENERATOR      | 611.13           |
| FLUKE                | 5100B      | VOLT.CALIBRATO       | 8,635.20         |
| HEWLETT PACKARD      | 9876A      | PRINTER              | 3,239.00         |
| TEKTRONIX            | 335        | OSCILLOSCOPE         | 2,755.20         |
| WEST                 | 2071-02-11 | CONTROLLER TEMPERATU | 680.00           |
| HEWLETT PACKARD      | 200CD      | AUDIO SIG GEN        | 282.49           |
| TEKTRONIX            | 335        | OSCILLOSCOPE         | 2,755.20         |
| EXACT                | 124        | OSCILLATOR           | 577.15           |
| WILKERSON            | A01AH      | REFRI. DRYER         | 400.00           |
| B & K INSTRUMENTS IN | 2619       | PREAMPLIFIER         | 442.00           |
| TEKTRONIX            | 7603       | OSCILLOSCOPE         | 2,186.55         |
| HEWLETT PACKARD      | 7015B      | X Y RECORDER         | 1,842.52         |
| PRECISION FILTERS    | MF32-00-01 | FILTERS              | 34,350.00        |
| TELEX                | CS-75      | HEADPHONES           | 100.00           |
| TEKTRONIX            | 545B       | OSCILLOSCOPE         | 1,635.48         |
| TRYGON               | HR40500    | POWER SUPPLY         | 152.50           |
| TEKTRONIX            | 5A18N      | PRE-AMP              | 285.00           |
| EPSON                | FX86C      | PRINTER, DIGITAL     | 386.00           |
| SIMPSON              | 260        | MULTIMETER           | 50.00            |
| TEKTRONIX            | PG502      | GENERATOR, PULSE     | 2,892.75         |
| TEKTRONIX            | 0120066    | PLUG-IN CABLE        | 30.00            |
| HEWLETT PACKARD      | 3476B      | DIG MULTIMETER       | 272.25           |
| GENRAD               | 1551B      | 1521B                | 1,155.00         |
| GENRAD               | 874G20     | G20 ATTENUATOR       | 30.00            |
| ULTIMATE COMPUTER SU | NONE       | MICROMANAGER WORK ST | 130.55           |
| ECD CORPORATION      | 100        | CAPACIT.METER        | 289.00           |

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| Manufacturer Name    | Model      | Description          | Acquisition Cost |
|----------------------|------------|----------------------|------------------|
| STARRETT             | HD46A1X    | GAGE BLOCKS          | 876.00           |
| ULTIMATE COMPUTER SU | NONE       | MICROMANAGER WORKSTA | 130.55           |
| ULTIMATE COMPUTER SU | NONE       | MICROMANAGER WORKSTA | 130.55           |
| HEWLETT PACKARD      | 1415A      | PLUG-IN              | 1,200.00         |
| WEINSCHEL            | BA-1D      | PRE AMP              | 1,200.00         |
| MOTOROLA             | H99SA+053H | 2-WAY FM RADIO       | 1,126.70         |
| MENSOR               | 11900      | DIG PRESS GAGE       | 2,375.00         |
| PHOTOCOM             | PC125      | PRESS CALIBRA        | 975.00           |
| FLOW DYNE            | N160115    | SONIC NOZZLE         | 250.00           |
| FLUKE                |            | MULTIMETER           | 130.00           |
| FLUKE                |            | MULTIMETER           | 130.00           |
| DATA PRECISION       | 936        | MULTIMETER           | 131.00           |
| HEWLETT PACKARD      | 3400A      | VOLTMETER RMS        | 527.85           |
| B & K INSTRUMENTS IN | 2619       | PREAMPLIFIER         | 442.00           |
| SHALLCROSS           | 6860       | PREC RES DECAD       | 135.00           |
| TEKTRONIX            | 2B67       | PLUG IN AMP          | 212.00           |
| HEWLETT PACKARD      | 5321B      | FREQ COUNTER         | 775.00           |
| HEWLETT PACKARD      | 5060232    | CABLE                | 100.00           |
| GENRAD               | W10MT      | VARIAC               | 95.00            |
| DELL                 | 316LT      | COMPUTER             | 1,973.00         |
| INTERNATIONAL BUSINE | 3192       | COMPUTER TERMINAL    | 747.00           |
| INTERNATIONAL BUSINE | 3192       | COMPUTER TERMINAL    | 747.00           |
| AMDEK                | 300        | DISPLAY, COMPUTER    | 180.00           |
| INTERNATIONAL BUSINE | 3192       | COMPUTER TERMINAL    | 747.00           |
| MAX TECH             | PB64       | BUFFER PRINTER       | 99.00            |
| WALLACE & TIERNAN    | FA160      | DIAL GAGE            | 194.00           |
| FLUKE                | 77         | DIGITAL MULTIMETER   | 143.10           |
| KEPCO                | ATE15-15M  | POWER SUPPLY         | 1,549.52         |
| VIGOR                | LM681      | LAMP                 | 45.00            |
| TEMPTRON             | 504        | FREEZE PT STD        | 575.00           |
| B & K INSTRUMENTS IN | 2607       | MEASURING AMP.       | 3,628.60         |
| WAVETEK              | 164        | FUNC GENERATOR       | 2,095.00         |
| B & K INSTRUMENTS IN | 2619       | PREAMPLIFIER         | 442.00           |
| B & K INSTRUMENTS IN | 2617       | CATHODE FOLLOW       | 350.86           |
| ELECTRONIC DEVELOPME | MV100N     | VOLTAGE STD.         | 747.50           |
| GENRAD               | W5MT3A     | VARIAC               | 95.00            |
| GENRAD               | W5MT3A     | VARIAC               | 95.00            |
| DURO DYNE            |            | PIN RIVETER          | 50.00            |
| DVC                  | 6275       | CAL. TEST UNIT       | 500.00           |
| TEKTRONIX            | 324        | OSCILLOSCOPE         | 1,285.25         |
| TEKTRONIX            | 5103N11    | OSCILLOSCOPE         | 1,062.15         |
| TEKTRONIX            | 335        | OSCILLOSCOPE         | 2,104.31         |
| TEKTRONIX            | 577D1      | OSCILLOSCOPE         | 2,376.50         |
| B & K INSTRUMENTS IN | 2426       | VOLTMETER AC         | 1,600.00         |
| B & K INSTRUMENTS IN | 2426       | VOLTMETER AC         | 1,600.00         |
| FLUKE                | 77         | DIGITAL MULTIMETER   | 130.00           |
| SIMPSON              | 461-2      | MULTIMETER           | 152.00           |
| DIGITAL EQUIPMENT CO | RK67TA     | DISC TESTER          | 5,411.95         |
| REALISTIC            | TRC-83     | TRANSCEIVER          | 39.95            |
| B & K INSTRUMENTS IN | 2619       | PREAMPLIFIER         | 442.00           |
| B & K INSTRUMENTS IN | 2619       | PREAMPLIFIER         | 442.00           |
| CML-MACARR           | MSS-1      | SIGNAL COURCE        | 34,374.00        |

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|----------------------|------------|----------------------|------------------|
| POWER DESIGN         | 2005       | POWER SUPPLY         | 379.00           |
| WEINSCHEL            | GS-1       | CONNECTOR GAGE       | 185.00           |
| SYSTRON DONNER       | 8130203    | TIME CODE READ       | 4,694.20         |
| TEKTRONIX            | 5403       | OSCILLOSCOPE         | 1,212.50         |
| MAX TECH             | PB64       | BUFFER               | 89.00            |
| MAX TECH             | PB64       | BUFFER PRINTER       | 99.00            |
| SIMPSON              | 260-6      | VOM                  | 60.28            |
| DATUM                | 9110       | GENERATOR, TIME CODE | 3,088.00         |
| HEWLETT PACKARD      | 3497A      | DATA ACQUISITION SYS | 6,579.87         |
| CORREN               | 100        | TORQUE GAGE          | 50.00            |
| GSE                  |            | LOCKER               | 41.40            |
| HELICOIL             | 06-6-40    | HELICOIL SET         | 38.15            |
| KISTLER              | 303B       | ACCELEROMETER        | 585.00           |
| DUNKLEBERGER         | 236        | RESIST SUB BOX       | 20.00            |
| HEWLETT PACKARD      | 200CD      | AUDIO SIG GEN        | 282.49           |
| TEKTRONIX            | 335        | OSCILLOSCOPE         | 2,104.31         |
| HONEYWELL            | 300AMP     | SHUNT                | 200.00           |
| HEWLETT PACKARD      | 938A       | DOUBLER FREQ.        | 1,511.81         |
| NEFF                 | 122-223    | AMPLIFIER            | 916.65           |
| MAGNAVOX             | 7BM623     | DISPLAY, COMPUTER    | 500.00           |
| IWATSU               | SS-5710D   | OSCILLOSCOPE         | 1,398.99         |
| IWATSU               | SS-5711D   | OSCILLOSCOPE         | 1,749.62         |
| ONO SOKKI            | CF940      | SPECTRUM ANALYZER    | 23,560.00        |
| HEWLETT PACKARD      | 3457A      | DIGITAL MULTIMETER   | 2,779.00         |
| LEAR SIEGLER         | ADM-3A     | TERMINAL, DISPLAY    | 550.00           |
| KISTLER              | 593        | CHARGE AMP           | 460.00           |
| GENERAL ELECTRIC     | 100WATT    | STANDARD LAMP        | 50.00            |
| HEWLETT PACKARD      | 11047A     | LOAD DIVIDER         | 25.00            |
| GENERAL ELECTRIC     | 7421-5     | STANDARD LAMP        | 50.00            |
| K D                  | 18         | STAKING TOOL         | 133.00           |
| HEWLETT PACKARD      | 334A       | ANALYZER             | 1,467.18         |
| WAVETEK              | 3000       | SIGNAL GEN           | 2,692.00         |
| HEWLETT PACKARD      | 5245L      | COUNTER              | 2,950.00         |
| W A STEWARD          | 100 MAG    | ROL-A-CHART          | 125.10           |
| HEWLETT PACKARD      | 10506B     | EXTENDER CABLE       | 30.00            |
| SMITH VICTOR         | 12U2       | STUDIO LIGHT         | 30.00            |
| BECKMAN              | 3010       | MULTIMETER           | 120.00           |
| OKIDATA              | 2410       | PRINTER              |                  |
| SMITH                | H102F      | REGULATOR            | 65.00            |
| RING KING            | AC0080     | ACOUSTIC ENCL0       | 99.95            |
| EXACT                | 504B       | GENERATOR            | 548.05           |
| FLUKE                | 332D       | POWER SUPPLY         | 2,935.10         |
| INTERNATIONAL BUSINE | 3192       | COMPUTER TERMINAL    | 747.00           |
| KEYTRONIC            | E03435     | KEYBOARD             | 85.00            |
| MOTOROLA             | H99SA+053H | 2-WAY FM RADIO       | 1,262.00         |
| MENSOR               | 11900      | PRESS INDICAT        | 2,800.00         |
| HEWLETT PACKARD      | 302A       | WAVE ANALYZER        | 1,821.81         |
| B & K INSTRUMENTS IN | 4134S      | MICROPHONE           | 300.00           |
| IWATSU               | SS6122     | OSCILLOSCOPE         | 1,721.00         |
| FLUKE                | 77         | DIGITAL MULTIMETER   | 143.10           |
| KEPCO                | ATE36-8M   | POWER SUPPLY         | 1,549.00         |
| SMITH MFG CO         | SM02805    | PRINTER STAND        | 85.00            |

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|----------------------|------------|----------------------|------------------|
| TEKTRONIX            | 475        | OSCILLOSCOPE         | 2,813.00         |
| HEWLETT PACKARD      | 400E       | AC VOLTMETER         | 391.05           |
| ADRET                | 201H       | GEN SYNTHESIZE       | 4,326.20         |
| HEWLETT PACKARD      | 3495A      | SCANNER              | 3,044.25         |
| FLOW DYNE            | ET16008    | FLOW STRAIGHTN       | 75.00            |
| HEWLETT PACKARD      | 9866A      | PRINTER              | 3,757.20         |
| B & K INSTRUMENTS IN | 2619       | PREAMPLIFIER         | 442.00           |
| ELECTRONIC DEVELOPME | 100        | CAPACI METER         | 289.00           |
| BALLANTINE           | 6125A      | SCOPE CALIBRA        | 1,837.50         |
| HEWLETT PACKARD      | 651A       | TEST OSCILLAT.       | 590.00           |
| B & K INSTRUMENTS IN | 4134/S     | MICROPHONE           | 447.00           |
| FLOW DYNE            | N160250    | SONIC NOZZLE         | 250.00           |
| RUMFORD              | 6975       | HI-INTENS LAMP       | 17.96            |
| GENRAD               | W5MT3      | VARIAC               | 95.00            |
| HEWLETT PACKARD      | 82169A     | INTERFACE            | 264.65           |
| KEITHLEY             | 181        | DIG. MULTIMETER      | 3,463.00         |
| DELTA DESIGN         | 9059       | TEST CHAMBER         | 4,890.00         |
| TEKTRONIX            | MR501      | MONITOR, WAVEFORM    | 532.00           |
| ASSOC                | R100       | CHARGER BATTERY      | 50.00            |
| NASA                 |            | POWER RES BANK       | 100.00           |
| TEKTRONIX            | 5A48       | PLUG-IN              | 450.00           |
| DELL                 | 316LT      | COMPUTER             | 1,973.00         |
| NASA                 | FR24A      | PRESS CONSOLE        | 573.00           |
| B & K INSTRUMENTS IN | 2804       | POWER SUPPLY         | 962.00           |
| B & K INSTRUMENTS IN | 2804       | POWER SUPPLY         | 160.00           |
| PSI                  | 780B       | PRESSURE MEASURING S | 11,515.00        |
| GRAPH-ON             | G0250      | TERMINAL, DISPLAYW/K |                  |
| HEWLETT PACKARD      | 6102A      | POWER SUPPLY         | 311.85           |
| HASTINGS             | SV-1X      | VACUUM GAUGE         | 300.00           |
| WELCH                | 8915A      | PUMP                 | 1,412.79         |
| ALTEC                | 689A       | MIKE                 | 92.00            |
| DUMORE               | 55-011     | TOOL GRINDER         | 284.00           |
| B & K INSTRUMENTS IN | 2426       | RMS VOLTMETER        | 1,640.64         |
| MOTOROLA             | T99KE-036W | TRANSCEIVER, RADIO   | 1,755.40         |
| GENRAD               | W5MT3A     | VARIAC               | 178.00           |
| MAGNAVOX             | 7B1623074G | DISPLAY              | 500.00           |
| HEWLETT PACKARD      | 75C        | CALCULATOR           | 750.00           |
| TEKTRONIX            | 576        | CURVE TRACER         | 2,716.00         |
| FLUKE                | 8800A      | DIG MULTIMETER       | 955.45           |
| BALDWIN LIMA HAMILTO | 625        | LOAD CAL KIT         | 272.50           |
| GENRAD               | 1232A      | AMPLIFIER            | 385.00           |
| HEWLETT PACKARD      | 5532A      | COUNTER              | 550.00           |
| B & K INSTRUMENTS IN | 1027A      | GENERATOR            | 7,403.04         |
| PAROSCIENTIFIC       | 600        | PRESS. MEAS. SYS     | 1,848.00         |
| RUSKA                | 6000801    | PRESSURE GAGE        | 10,715.00        |
| HEWLETT PACKARD      | 6236B      | PWR SUPPLY           | 528.00           |
| HEIR-KLINE (PRO CRAF |            | SOLDERING MACHINE    | 188.00           |
| GATEWAY              | PMV1448    | DISPLAY              | 300.00           |
| AEROTECH             | U11R-2-A   | POSITION-CONTROLLER  | 3,095.00         |
| ETHERNET             | LE050A     | TRANSCEIVER          | 323.28           |
| GENRAD               | 1210C      | SIG. GENERATOR       | 210.00           |
| SIMPSON              | 260        | VOM                  | 61.65            |

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|----------------------|------------|---------------------|------------------|
| TEKTRONIX            | 7904       | OSCILLOSCOPE        | 3,540.50         |
| HEWLETT PACKARD      | 6002A      | POWER SUPPLY        | 1,138.50         |
| FLUKE                | 2190A      | DIGTHERMOMETER      | 1,045.00         |
| DATAMETRICS          | 1015       | SIGNAL COND.        | 1,740.00         |
| SPECTRAL DYNAMICS    | SD105C     | SERVO/MONITOR       | 2,235.00         |
| HEWLETT PACKARD      | 85A        | DESKTOP COMPUTER    | 2,907.00         |
| L & N                | 4363       | SHUNT               | 85.00            |
| HEWLETT-PACKARD      | 6205C      | POWER SUPPLY        | 1,050.00         |
| TELEVIDEO            | 950        | TERMINAL            | 1,004.00         |
| B & K INSTRUMENTS IN | 2639       | PREAMPLIFIERS       | 887.00           |
| NEFF                 | 122-122    | AMPLIFIER           | 650.00           |
| GENRAD               | 1218A      | OSCILLATOR          | 465.95           |
| KEITHLEY             | 130A       | DIG MULTIMETER      | 113.90           |
| HEWLETT-PACKARD      | 11722A     | MODULE SENSOR       | 2,260.00         |
| GENRAD               | 1482K      | STD. INDUCR.        | 145.00           |
| LAMBDA               | LH124FM    | POWER SUPPLY        | 180.22           |
| INTELLIGENT SYS      | B8001G     | MONITOR/KEYBOARD    |                  |
| HAZELTINE            | 4DTD155207 | MONITOR             |                  |
| SUNDSTRAND           | 808K1/5    | CAL. VIB STD        | 921.50           |
| SNAP ON TOOLS        | TQ3        | TORQUE WRENCH       | 38.00            |
| WESTINGHOUSE         | 1000W      | STANDARD LAMP       | 75.00            |
| L & W                | 4050B      | STD RESISTOR        | 150.00           |
| GUILDLINE            | 95206      | STD RESISTOR        | 325.00           |
| HEWLETT PACKARD      | 2686A      | DIGITAL PRINTER     | 2,676.65         |
| HOLT                 | HCS1       | CURRENT SHUNT       | 884.00           |
| BELL & HOWELL        | SR VIII    | READER              | 177.00           |
| GENRAD               | W5MT3A     | VARIAC              | 95.00            |
| HEWLETT PACKARD      | 5321B      | ELECT COUNTER       | 775.00           |
| FLUKE                | 8800A      | DIG MULTIMETER      | 955.45           |
| FLUKE                | 77         | DIGITAL MULTIMETER  | 143.10           |
| HI-TEK               | RT-101     | KEYBOARD            | 90.00            |
| EG&G                 | 911        | HYGROMETER          | 3,586.25         |
| TELEDYNE             | S-86-CN    | PUMP                | 495.00           |
| TRYGON               | HR40750    | POWER SUPPLY        | 329.00           |
| FLUKE                | 8000A      | VOLTMETER           | 290.03           |
| KISTLER              | 537        | TESTER INSULAT      | 180.00           |
| B & K INSTRUMENTS IN | 4220       | PISTON PHONE        | 395.00           |
| B & K                | 2619       | PRE-AMP             | 600.00           |
| B & K                | 4138       | MICROPHONE          | 900.00           |
| NICOLET              | 3010       | CONVERTER           | 795.00           |
| DATAMETRICS          | 1015       | SIGNAL COND.        | 1,740.00         |
| MKS                  | 126PS      | POWER SUPPLY        | 652.05           |
| RUSKA                | 6000-80    | MANOMETER           | 4,483.00         |
| PCB PIEZONTRONICS    | 483A02     | POWER UNIT          | 450.00           |
| MICROSERVE           | 386/SX     | COMPUTER W/KEYBOARD | 1,200.00         |
| TEKTRONIX            | 190B       | ATTENUATOR          | 5.00             |
| B & K INSTRUMENTS IN | 2804       | POWER SUPPLY        | 962.00           |
| B & K INSTRUMENTS IN | 2804       | POWER SUPPLY        | 988.95           |
| MOTOROLA             | HCN1036E90 | CONTROLLER          | 512.00           |
| B & K                | 4134       | MICROPHONE          | 908.00           |
| B & K                | 4134       | MICROPHONE          | 908.00           |
| SPECTRAL DYNAMICS    | SD104      | OSCILLATOR          | 2,989.00         |

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| Manufacturer<br>Name | Model      | Description          | Acquistion<br>Cost |
|----------------------|------------|----------------------|--------------------|
| GENRAD               | 1454A      | DEC VOLT DIV         | 161.89             |
| DVC                  | 6275       | CAL TEST UNIT        | 500.00             |
| TEKTRONIX            | PS503      | POWER SUPPLY         | 150.00             |
| FLUKE                | 77         | DIGITAL MULTIMETER   | 107.10             |
| GUILDLINE            | 9152/6S    | STD CELL ENCL.       | 1,210.00           |
| F & P                | 10C1505    | FLOW METER           | 492.00             |
| COMPUADD             | 286        | MICRO COMPUTER       | 1,128.00           |
| LYNX                 | 500        | TESTER, HARD DISK    | 2,375.00           |
| K & E                | 830010     | PLUMB BOB            | 5.00               |
| K & E                | 100FT      | STEEL TAPE           | 10.00              |
| HITACHI              | VC6165     | OSCILLOSCOPE         | 5,567.50           |
| HEWLETT PACKARD      | 3310A      | FUNCTION GEN         | 589.05             |
| RUSKA                | 2461-80    | BELLOWS              | 1,200.00           |
| MOTOROLA             | HCN1036E90 | CONTROLLER           | 512.00             |
| HEWLETT PACKARD      | 200CD      | OSCILLATOR           | 270.87             |
| GENRAD               | 1432B      | DECADE RESIST        | 220.00             |
| FLUKE                | 8000A      | MULTIMETER           | 338.53             |
| DEC                  | RM80AA     | DISK DRIVE           | 25,415.00          |
| GENRAD               | W5MT3A     | VARIAC               | 50.00              |
| BIDDLE               |            | MEGOHMMETER          | 210.88             |
| SENCORE              | LC53       | CAPACITOMETER        | 647.00             |
| BALDWIN LIMA HAMILTO | 626        | GAGE CALIB           | 265.00             |
| SIMPSON              | 260        | VOM                  | 61.65              |
| HEWLETT PACKARD      | 5245L      | COUNTER              | 2,984.15           |
| HEWLETT-PACKARD      | 33449A     | PRINTER, LASER       | 1,514.00           |
| B & K INSTRUMENTS IN | 2606A      | VOLTMETER            | 1,632.00           |
| B & K INSTRUMENTS IN | 4230       | CALIBRATOR S.L       | 284.00             |
| BEST POWER           | MD1KVA     | POWER SUPPLY         | 1,490.00           |
| TELEDYNE             | VT-6B      | VACUUM GAGE          | 245.00             |
| CEL INSTRUMENTS      | 213        | NOISE GENERATOR      | 611.13             |
| FLUKE                | 8300A      | VOLTMETER            | 2,701.45           |
| DATRON               | 4708       | STANDARD CALIBRATION | 24,810.00          |
| IBM                  | 5160       | COMPUTER W/KEYBOARD  |                    |
| HEWLETT PACKARD      | 9835A      | CALCULATOR           | 10,373.00          |
| B & K INSTRUMENTS IN | 2425       | RMS VOLTMETER        | 1,160.64           |
| ECTRON               | 1120       | CALIBRATOR           | 5,078.00           |
| HEWLETT-PACKARD      | 2623A      | MONITOR/KEYBOARD     |                    |
| HEWLETT PACKARD      | 616B       | UHF GENERATOR        | 1,950.00           |
| B & K INSTRUMENTS IN | 2426       | VOLTMETER AC         | 1,600.00           |
| B & K INSTRUMENTS IN | 2426       | VOLTMETER AC         | 1,600.00           |
| B & K INSTRUMENTS IN | 4134       | MICROPHONE           | 210.00             |
| SIMPSON              | 260-6      | MULTIMETER           | 60.28              |
| TEKTRONIX            | 130        | LC METER             | 225.00             |
| DATAPULSE            | 101        | PULSE GENERAT.       | 405.00             |
| BELL & HOWELL        | 4-462      | DIG MANOMETER        | 4,298.75           |
| HEWLETT PACKARD      | 3300A      | FUNCTION GEN         | 1,226.00           |
| WELCH                | 1402       | VAC PUMP             | 325.00             |
| BROWN & SHARPE       | C800A      | VERN HT GAGE         | 121.75             |
| TEKTRONIX            | 7A26       | PREAMPLIFIER         | 1,050.00           |
| TEKTRONIX            | 604        | CRT DISPLAY          | 894.94             |
| F & P                | 10C1505    | FLOW METER           | 327.00             |
| HASTINGS             | VT-6       | VACUUM GAUGE         | 275.00             |



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| Manufacturer Name    | Model      | Description        | Acquistion Cost |
|----------------------|------------|--------------------|-----------------|
| DCA                  | 201608     | MULTIPLEXOR        | 2,804.00        |
| MM & M               | 8100AW     | FLUTTER METER      | 2,491.20        |
| HEWLETT PACKARD      | 35731A     | DISPLAY, COMPUTER  | 796.00          |
| SIMPSON              | 260        | VOM                | 61.65           |
| TEKTRONIX            | 067-050    | PLUG-IN SCOPE      | 100.00          |
| JARRETT INST.        | B-11       | TRIPLE POINT       | 658.00          |
| FLUKE                | 200        | IC TESTER          | 431.65          |
| SKILL                | 2016       | DRILL PORTABLE     | 119.00          |
| TEKTRONIX            | 335        | OSCILLOSCOPE       | 1,862.44        |
| KISTLER              | 808K1      | ACCELEROMETER      | .00             |
| TRIPLETT             | 310        | VOM                | 105.00          |
| SHALLCROSS           | 6860       | RESIST BOX         | 190.00          |
| TRIPLETT             | 310        | VOM                | 105.00          |
| FISHER SCIENTIFIC    | 50ML       | BURET              | 37.50           |
| TEKTRONIX            | 3S1        | PLUG-IN            | 1,151.92        |
| TRIPLETT             | 310        | VOLT OHM METER     | 49.68           |
| TEKTRONIX            | TG501      | GENERATOR          | 962.66          |
| TEKTRONIX            |            | CAL. FIXTURE       | 2,000.00        |
| IBM                  | 5151-001   | MONITOR            | 192.00          |
| B & K                | 4134       | MICROPHONE         | 908.00          |
| COMPUADD             | 51086      | MONITOR            | 334.00          |
| HITACHI              | VC6165     | OSCILLOSCOPE       | 5,567.50        |
| B & K                | 4134       | MICROPHONE         | 900.00          |
| JEBCO                | NONE       | CABINET            | 50.00           |
| TEKTRONIX            | 106        | SQ WAVE GEN        | 665.00          |
| TEKTRONIX            | TM504      | PWR MODULE         | 184.30          |
| KEITHLEY             | 130A       | DIG MULTIMETER     | 113.90          |
| COLLINS              | 390A/UR    | RECEIVER           | 100.00          |
| INTERNATIONAL BUSINE | 5152002    | DIG. PRINTER       | 412.00          |
| TRANSISTOR DEVICES   | DLR15-50-1 | DYNA-LOAD          | 497.00          |
| WELCH                | 8915A      | PUMP, VACUUM       | 1,412.79        |
| B & K INSTRUMENTS IN | 4134S      | MICROPHONE         | 300.00          |
| L & N                | 4361       | SHUNT              | 250.00          |
| GENRAD               | 1403-N     | STD CAPACITOR      | 115.00          |
| B & K INSTRUMENTS IN | 4220       | MIC CALIBRATOR     | 461.87          |
| DATATAPE             | TSC2000    | TAPE CALIBRATOR    | 9,952.00        |
| MOTOROLA             | 01-P02690N | RADAR TRANSCEIVER  | 24,028.00       |
| HEWLETT PACKARD      | 440A       | DETECTOR MTR       | 85.00           |
| HEWLETT PACKARD      | 11042A     | PROBE T CONN       | 50.00           |
| HELICOIL             | 5/16-18    | HELICOIL SET       | 26.20           |
| DEC                  | VT180      | TERMINAL, COMPUTER | 1,552.00        |
| FLUKE                | 853A       | DIG MULTIMETER     | 480.00          |
| B & K INSTRUMENTS IN | 2639       | PREAMPLIFIERS      | 887.00          |
| L & N                | 4222B      | STD. RESISTOR      | 150.00          |
| SPECTRAL DYNAMICS    | SD335      | ANALYZER           | 9,751.00        |
| KEITHLEY             | 130A       | DIG MULTIMETER     | 113.90          |
| F & P                | 10C1516    | FLOWMETER          | 2,400.00        |
| B & K                | 4133       | MICROPHONE         | 900.00          |
| B & K INSTRUMENTS IN | 2636       | MEAS.AMPLIFIER     | 11,149.20       |
| DATAMETRICS          | 1015       | SIGNAL COND.       | 1,740.00        |
| TENNEY               | TENNYJR    | TEMP.TEST CHAM     | 4,801.60        |
| SMITH                | H421       | REGULATOR          | 65.00           |

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| Manufacturer<br>Name | Model      | Description          | Acquistion<br>Cost |
|----------------------|------------|----------------------|--------------------|
| CONTROL DATA         | 1209.51    | CEALIGNMENT RACK     | 1,835.00           |
| EDC CORPORATION      | CR103      | VOLTAGE STD.         | 1,850.00           |
| AMAZING              | CM-8484EX  | DISPLAY UNIT         | 200.00             |
| HEWLETT-PACKARD      | 2623A      | MONITOR W/KEYBOARD   |                    |
| NICOLET              | 3091       | OSCILLOSCOPE         | 4,465.00           |
| VALHALLA             | 2724A      | STANDARD, CALIB      | 4,713.00           |
| B & K INSTRUMENTS IN | 2804       | PWR. SUPPLY, MIC     | 988.95             |
| FISHER & PORTER      | 10C1516D   | FLOWMETER            | 1,559.90           |
| L & N                | 8079-B     | TEMP BRIDGE          | 6,640.50           |
| B & K                | 2619       | PRE-AMP              | 600.00             |
| B & K                | 2619       | PRE-AMP              | 600.00             |
| B & K                | 4138       | MICROPHONE           | 900.00             |
| CONSOLIDATED CONTROL | 24-120     | LEAK DETECTOR        | 3,900.00           |
| TEKTRONIX            | P6021      | CURRENT PROBE        | 181.00             |
| NASA                 | WNC        | G LEVEL              | 50.00              |
| FLUKE                | 8000A      | VOLTMETER            | 290.03             |
| WALLACE & TIERNAN    | FA160      | PRESS GAUGE          | 171.00             |
| MENSOR               | 14000B     | PRESSURE INDICATOR   | 3,555.00           |
| HEWLETT PACKARD      | 85B        | PERSONAL COMPUTER    | 2,341.65           |
| GENERAL RESISTANCE   | DV4107     | VOLTAGE DIV.         | 895.00             |
| B & K INSTRUMENTS IN | 2426       | RMS VOLTMETER        | 1,640.64           |
| TEKTRONIX            | 015-0361-0 | CURRENT LOOP POD     | 481.60             |
| UNHOLTZ DICKIE       | 1611       | STANDARDIZER, CALIBR | 1,455.00           |
| TECHNI-TOOL          | 849P0700   | VACUUM CLEANER       | 233.00             |
| HEWLETT PACKARD      | 350CD      | ATTENUATOR           | 126.78             |
| SCHWEIN              | 1095       | PRESS. REG.          | 1,485.00           |
| PANASONIC            | KXP1124    | PRINTER              | 340.00             |
| TELEVIDEO            | 970        | TERMINAL W/KEYBOARD  |                    |
| ARROW                | 240C       | DECADE BOX           | 115.00             |
| SIMPSON              | 260-6      | VOM                  | 60.28              |
| PACE                 | PRC151     | POWER SUPPLY         | 1,250.00           |
| B & K                | 2426       | VOLTMETER            | 1,600.00           |
| SPECTRAL DYNAMICS    | SD104A-1   | OSCILLATOR, SWEEP    | 1,916.00           |
| ELECTRONIC DEVELOPME | 501H       | VOLTAGE STANDARD     | 3,259.00           |
| FLUKE                | 5220A      | AMPLIFIER            | 3,370.00           |
| BELL & HOWELL        | SR VIII    | READER               | 177.00             |
| B & K                | 4134       | MICROPHONE           | 900.00             |
| UNHOLTZ DICKIE       | 1611       | CAL STANDARD         | 1,515.00           |
| UNHOLTZ DICKIE       | 1611       | CAL STANDARD         | 1,515.00           |
| K & E                | MR II      | DISTANCE MEASU.      | 5,000.00           |
| FLUKE                | 77         | MULTIMETER           | 135.00             |
| PERKINS              |            | SPRING WINDER        | 320.00             |
| COMPUADD             | 286        | MICRO COMPUTER       | 1,128.00           |
| HEWLETT PACKARD      | 85A        | CALCULATOR           | 3,087.50           |
| SYSTRON DONNER       | 8120295    | TIME CODE GEN        | 2,900.00           |
| FACIT                | 4555       | PRINTER              | 1,995.00           |
| BERGER               | NONE       | TRIPOD               | 50.00              |
| TEKTRONIX            | T932       | OSCILLOSCOPE         | 1,088.44           |
| HEWLETT PACKARD      | 5245L      | COUNTER              | 2,980.70           |
| TEKTRONIX            | DC505      | FREQ CONVERTER       | 1,838.00           |
| PAROSCIENTIFIC       | 215-A      | PRESS MEAS.SYS       | 2,985.00           |
| NETWORK              | AD16       | TESTER               | 1,249.00           |

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| Manufacturer<br>Name | Model      | Description          | Acquistion<br>Cost |
|----------------------|------------|----------------------|--------------------|
| TEKTRONIX            | 6R1A       | PLUG IN              | 2,763.20           |
| TEKTRONIX            | 567        | OSCILLOSCOPE         | 759.73             |
| TEKTRONIX            | 545B       | SCOPE                | 1,550.00           |
| B & K INSTRUMENTS IN | 2639       | PREAMPLIFIERS        | 887.00             |
| GUILDLINE            | 9923       | POWER SUPPLY         | 6,384.00           |
| HEWLETT PACKARD      | 5328A      | FREQ. COUNTER        | 2,468.00           |
| KEITHLEY             | 130        | DIG MULTIMETER       | 124.00             |
| TEKTRONIX            | PS503      | POWER SUPPLY         | 150.00             |
| HEWLETT PACKARD      | 59501A     | POWER SUPPLY         | 501.32             |
| EPPLEY               | 118        | STD CELL ENCL.       | 1,235.00           |
| ESI                  | LC875B     | LEAD COMPENS.        | 354.68             |
| PRATT & WHITNEY      |            | DRILL PRESS          | 250.00             |
| TEKTRONIX            | 465DM43    | OSCILLOSCOPE         | 2,662.65           |
| B & K INSTRUMENTS IN | 2804       | POWER SUPPLY         | 962.00             |
| KROHN HITE           | 6400       | PHASE METER          | 1,403.00           |
| KROHN HITE           | 5600       | FUNCTION GEN.        | 695.00             |
| INFRARED IND.        | 463        | RADITION SOURC       | 2,100.00           |
| L & N                | 4221B      | STD. RESISTOR        | 150.00             |
| B & K INSTRUMENTS IN | 4134       | MICROPHONE           | 210.00             |
| B & K INSTRUMENTS IN | 4134       | MICROPHONE           | 210.00             |
| HEWLETT PACKARD      | 6205B      | POWER SUPPLY         | 514.80             |
| HEWLETT PACKARD      | 5022A      | LOGIC KIT            | 700.00             |
| TEKTRONIX            | 3B3        | PREAMPLIFIER         | 680.00             |
| KEITHLEY             | 147        | NANOVOLT NULL DET    | 1,382.50           |
| QSC                  | 1100       | AMPLIFIER            | 398.90             |
| PLANTRONICS          | HSB552-1   | HEAD PHONES          | 113.33             |
| PLANTRONICS          | SUPRA      | HEADPHONES           | 100.00             |
| ROCKWELL             | NONE       | PED. GRINDER         | 223.57             |
| APPLE                | A250016    | COMPUTER, PERSONAL   | 1,125.00           |
| TEKTRONIX            | 5A18N      | PLUG IN              | 212.50             |
| HEWLETT PACKARD      | 5321B      | ELECT COUNTER        | 775.00             |
| HEWLETT PACKARD      | 5512-A     | COUNTER              | 1,190.56           |
| B & K INSTRUMENTS IN | 4133/S     | MICROPHONE           | 447.00             |
| HEWLETT PACKARD      | 211A       | SQ WAVE GEN          | 361.81             |
| HEWLETT PACKARD      | 5262A      | TIME INT UNIT        | 250.00             |
| KEYTRONIC            | E0341      | KEYBOARD             | 59.00              |
| HEWLETT PACKARD      | 5321B      | ELECT COUNTER        | 775.00             |
| HONDA                | EX5500     | GASOLINE GENERATOR   | 2,293.00           |
| TRIPLETT             | 3525       | DIGI-PROBE           | 65.00              |
| ZEISS                | TH43       | THEODOLITE           | 2,000.00           |
| HEWLETT PACKARD      | 82906A     | PRINTER, DIG.        | 715.00             |
| TEKTRONIX            | 067-0616   | PLUG-IN EXTEND.      | 695.00             |
| MONTEREY RESEARCH    | 516F       | ACCEL PROGRAM        | 20,000.00          |
| PENN AIRBORNE        | 9A5119-105 | STANDARD RESISTOR-IT | 625.00             |
| HEWLETT-PACKARD      | 8902A      | SIGNAL ANALYZER      | 30,135.00          |
| DEC                  | RX180AB    | DISK DRIVE           | 898.00             |
| SIMPSON              | 160        | METER                | 60.72              |
| F & P                | 10C1505    | FLOW METER           | 432.00             |
| MOTOROLA             | T99KE-036W | TRANSCEIVER, RADIO   | 1,755.40           |
| MOTOROLA             | L43JJB1100 | TRANSCEIVER          | 1,272.00           |
| B & K                | 4134       | MICROPHONE           | 900.00             |
| HEWLETT PACKARD      | 3495A      | RELAY SCANNER        | 2,920.50           |

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| Manufacturer Name    | Model      | Description          | Acquistion Cost |
|----------------------|------------|----------------------|-----------------|
| POWER MATE           | BPA-20E    | POWER SUPPLY         | 339.00          |
| S. S. WHITE          |            | ABRASIVE MACH        | 675.00          |
| GENRAD               | 1409-X     | STD. CAPACITOR       | 500.00          |
| WILTON               | NONE       | WISE                 | 35.00           |
| HEWLETT PACKARD      | 9122D      | DISK DRIVE           | 796.00          |
| EPSON                | P70RA      | DIGITAL PRINTER      | 300.00          |
| HEWLETT PACKARD      | 9830A      | CALCULATOR           | 11,833.50       |
| WEATHER MEASURE CORP | EPR 200    | STRIP CHART RC       | 1,550.00        |
| FLUKE                | 8800A      | DIG MULTIMETER       | 972.69          |
| GENRAD               | 1404-A     | STD. CAPACITOR       | 500.00          |
| METRAPLEX            | 376        | TEST SET             | 3,036.00        |
| WYSE                 | WY-60      | TERMINAL             | 294.00          |
| WYSE                 | WY-60      | TERMINAL             | 294.00          |
| TEKTRONIX            | 190A       | CONST AMP GEN        | 300.00          |
| HEWLETT PACKARD      | 5489A      | FILTER               | 426.95          |
| GENRAD               | 1382       | GENERATOR            | 608.85          |
| B & K INSTRUMENTS IN | 4220       | PISTON PHONE         | 395.00          |
| SIMPSON              | 260        | V O M                | 50.00           |
| GENERAL ELECTRIC     | NONE       | RIB FILA LAMP        | 75.00           |
| TEKTRONIX            | 067-058    | EXTENDER             | 85.00           |
| HEWLETT-PACKARD      | 3458A      | DIGITAL MULTIMETER   | 6,782.40        |
| MOTOROLA             | T99VB-004W | RADIO, FM            | 2,332.78        |
| FLUKE                | 5200A      | AC VOLTAGE CALIBRATO | 17,719.00       |
| FLUKE                | 5215A      | POWER AMPLIFIER      | 2,100.00        |
| INSTRULAB            | 4221-B-8   | DIGITAL THERMOMETER  | 4,080.25        |
| HEWLETT PACKARD      | 3478A      | DIGITAL MULTIMETER   | 937.29          |
| DRUCK                | DPI260     | PRESSURE SYSTEM      | 1,050.15        |
| IBM                  | 515001     | TERMINAL W/KEYBOARD  |                 |
| APPLE                | M5011      | COMPUTER             | 2,034.00        |
| ULTRA-X              | RACER      | PC DIAGNOSTIC CARD   | 579.00          |
| TEMPTRON             | 506        | TEMP. STD.           | 750.00          |
| FLUKE                | 5450A      | RESISTANCE CAL       | 3,755.30        |
| EPSON                | P70RA      | DIGITAL PRINTER      | 300.00          |
| STANDARD             | MCH-4095N  | MONITOR              | 475.00          |
| MONARCH              | 590        | REEL TAPE RACK       | 437.00          |
| SYSTRON DONNER       | 9015       | VOLTMETER            | 485.10          |
| HEWLETT PACKARD      | 3440A      | D V M                | 1,166.50        |
| B & K INSTRUMENTS IN | 2426       | RMS VOLTMETER        | 1,640.64        |
| HEWLETT PACKARD      | 9862A      | PLOTTER              | 2,875.20        |
| GENRAD               | W5MT3A     | VARIAC               | 95.00           |
| INTEL                |            | MONITOR/KEYBOARD     |                 |
| HAZELTINE            | 4DTD155207 | MONITOR              |                 |
| GENRAD               | 1482P      | STD. INDUCR.         | 190.00          |
| GENRAD               | 1482T      | STD. INDUCR.         | 385.00          |
| CHICAGO MAJ          |            | TRIPOD               | 75.85           |
| LAMBDA               | LH124FM    | POWER SUPPLY         | 179.00          |
| QSC                  | 1100       | AMPLIFIER            | 398.90          |
| QSC                  | 1100       | AMPLIFIER            | 398.90          |
| IDEAL AEROSMITH      | 1406R      | TEST TABLE           | 235.00          |
| KEITHLEY             | 192        | MULTIMETER           | 1,195.00        |
| B & K INSTRUMENTS IN | 4134       | MICROPHONE           | 210.00          |
| RUSKA                | S100714    | PISTON ASSY.         | 4,100.00        |

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| Manufacturer Name    | Model      | Description          | Acquisition Cost |
|----------------------|------------|----------------------|------------------|
| INLAND               | 403        | CONTROL CHASIS       | .00              |
| GUILDLINE            | 9930       | POTENTIOMETER        | 9,540.00         |
| INDUSTRIAL COMPUTER  | 8531-RV    | COMPUTER W/KEYBOARD  |                  |
| GENERAL EASTERN      | 1311XR     | POWER SUPPLY         | 1,500.00         |
| WYSE                 | WY-60-01-0 | TERMINAL, COMPUTER   | 317.00           |
| TRANS-SONICS         | 130        | WATER CELL           | 600.00           |
| TEKTRONIX            | L          | PLUG IN AMP          | 212.00           |
| TEKTRONIX            | L          | PLUG IN AMP          | 212.00           |
| UNHOLTZ DICKIE       | 608PS-1    | PWR SUPPLY           | 425.00           |
| KEYTRONIC            | E03435     | KEYBOARD             | 85.00            |
| HEWLETT PACKARD      | 745A       | VOLT CALIBRA         | 8,177.40         |
| SEARS                | M          | FREEZER              | 189.00           |
| KEITHLEY             | 10/10      | HI MEG RES STR       | 132.50           |
| GENRAD               | 102T       | PRE RESISTANCE       | 275.00           |
| GUILDLINE            | 9975       | RESIS.BRIDGE         | 15,355.20        |
| EIP MICRO.           | 578        | FREQ. COUNTER        | 15,375.00        |
| MOTOROLA             | 01-P02690N | RADAR TRANSCEIVER    | 9,208.00         |
| HEWLETT-PACKARD      | 410C       | VOLTMETER            | 427.00           |
| TEKTRONIX            | 067-1221-0 | VIDEO GENERATOR      | 1,427.00         |
| HEWLETT PACKARD      | 467A       | PWR AMPLIFIER        | 580.35           |
| MOTOROLA             | T99VB-004W | RADIO, FM            | 2,332.78         |
| MOTOROLA             | T99VB-004W | RADIO, FM            | 2,332.78         |
| LINSEIS              | L2025      | STRIP CHART RECORDER | 3,277.78         |
| MONARCH              | 590        | REEL TAPE RACK       | 437.00           |
| B & K INSTRUMENTS IN | 4134S      | MICROPHONE           | 300.00           |
| HEWLETT PACKARD      | 7550A      | PLOTTER              | 2,613.00         |
| INNOVENTIONS         |            | RAM TESTER           | 550.00           |
| EPSON                | P70RA      | DIGITAL PRINTER      | 300.00           |
| EPSON                | P70RA      | DIGITAL PRINTER      | 300.00           |
| GENRAD               | 1432X      | DECADE RESIST        | 100.00           |
| HEWLETT PACKARD      | 5253B      | FREQ CONVERT         | 502.42           |
| BALDWIN LIMA HAMILTO | 626        | ST GAGE CALIB        | 265.00           |
| TERMALINE            | 611        | WATTMETER            | 28.00            |
| HEWLETT-PACKARD      | 5245L      | COUNTER              | 2,480.00         |
| STANDARD             | MCH-4095N  | MONITOR              | 475.00           |
| TEKTRONIX            | 013013     | EXTENDER BOARD       | 20.00            |
| OREGON               | A3         | POWER SUPPLY         | 179.23           |
| IO TECH              | 488        | ANALYZER, DIGITAL BU | 1,795.00         |
| HEWLETT PACKARD      | 9122D      | DISK DRIVE           | 796.00           |
| HEWLETT PACKARD      | 746A       | VOLT AMP             | 3,265.00         |
| TEKTRONIX            | 7B53A      | PLUG IN              | 1,171.00         |
| TEKTRONIX            | TG501      | TIME MARK GEN        | 1,475.00         |
| HEWLETT PACKARD      | 3050B      | DATA ACQ SYST        | 10,091.42        |
| BALDWIN LIMA HAMILTO | 625        | CALIBRATOR           | 272.50           |
| FLUKE                | 752A       | VOLT. DIVIDER        | 3,795.25         |
| FLUKE                | 77         | MULTIMETER           | 135.00           |
| EPSON                | LX-80      | PRINTER              | 350.00           |
| TEKTRONIX            | 464        | SCOPE                | 3,501.70         |
| HELICOIL             | 5/16-24    | HELICOIL SET         | 29.05            |
| TEKTRONIX            | D          | PLUG IN AMP          | 172.00           |
| FLUKE                | 931B       | VOLTMETER            | 965.15           |
| SMITH MANUFACTURING  | SM02805    | PRINTER STAND        | 85.00            |

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| Manufacturer Name    | Model      | Description          | Acquisition Cost |
|----------------------|------------|----------------------|------------------|
| HEWLETT PACKARD      | 410C       | VOLTMETER            | 427.00           |
| GENRAD               | 1450TBR    | ATTENUATOR           | 395.00           |
| TRIPLETT             | 310        | VOM                  | 105.00           |
| NASA                 | 4" X 8"    | SCREEN ROOM          | 2,000.00         |
| TEKTRONIX            | 874K       | CAPACITOR COUP       | 12.00            |
| KAYE INSTRUMENTS     | K 140-4    | JUNCTION BOX         | 895.00           |
| MKS                  | 270B       | SIGNAL CONDITIONER   | 2,325.00         |
| B & K                | 2619       | PRE-AMP              | 600.00           |
| B & K                | 4136       | MICROPHONE           | 900.00           |
| LR MFG.              | 51         | MASTER PARTS         | 76.50            |
| HELICOIL             | 1/4-20     | HELICOIL SET         | 25.15            |
| FUJITSU              | FKB2930    | KEYBOARD, COMPUTER   | 99.00            |
| TEKTRONIX            | TM503      | POWER MODULE         | 218.25           |
| HEWLETT PACKARD      | 746A       | VOLTAGE AMP          | 2,029.50         |
| SONY                 | CVM1720    | T V MONITOR          | 788.50           |
| KROHN HITE           | 3343       | BAND PASSFILTE       | 1,761.12         |
| ROSEMOUNT            | 914C4      | TEMP BATH            | 11,175.00        |
| TEKTRONIX            | TM503      | POWER MODULE         | 250.00           |
| B & K INSTRUMENTS IN | 1616       | BANDPASS FILTR       | 3,355.20         |
| L & N                | 8641       | PYROMETER            | 3,800.00         |
| WESTON               | 622        | DC MICROAMMETR       | 258.37           |
| POWER DESIGN         | 5015A      | POWER SUPPLY         | 234.00           |
| DATAMETRICS          | 700        | POWER SUPPLY         | 604.50           |
| HEWLETT PACKARD      | 7550A      | PLOTTER GRAPH.       | 2,613.00         |
| HARTLEYS MACHINE CO. | 411        | POWER SUPPLY         | 2,475.00         |
| GENRAD               | W5MT3A     | VARIAC               | 95.00            |
| HELICOIL             | 1/4-28     | HELICOIL SET         | 27.95            |
| PC'S LIMITED         | AT110      | COMPUTER, PERSONAL   | 1,200.00         |
| EPSON                | FX1050     | PRINTER              | 659.00           |
| BELL & HOWELL        | SR VIII    | READER               | 177.00           |
| TEKTRONIX            | 7B53A      | TIME BASE            | 1,098.11         |
| TEKTRONIX            | 7A11       | AMPLIFIER            | 2,470.00         |
| FLUKE                | 8506A      | DIGITAL MULTIMETER   | 6,984.00         |
| B & K                | 4133       | MICROPHONE           | 900.00           |
| FLUKE                | 80I-410    | CURRENT PROBE AC/DC  | 259.00           |
| SANSUNG              | CM4531     | MONITOR              | 439.00           |
| PACE INC             | PFP40      | FUSE SET REPAIR STAT | 977.00           |
| WYSE                 | 900128-02  | KEYBOARD             | 117.00           |
| MICRODOT             | F321A      | OSCILLATOR           | 544.75           |
| WAVETEK              | 103        | FUNCT GEN            | 598.00           |
| TEKTRONIX            | PG506      | CAL.GENERATOR        | 1,095.00         |
| MAX TECH             | PB64       | BUFFER               | 89.00            |
| B & K INSTRUMENTS IN | 4144       | MICROPHONE           | 250.00           |
| HITACHI              | V1060      | OSCILLOSCOPE         | 1,276.00         |
| MOTOROLA             | 01-P02690N | RADAR TRANSCEIVER    | 9,208.00         |
| PRO-LOG CORP         | PM9053A    | PERSONALITY MODULE   | 630.00           |
| INTELLIGENT SYS      | B8001G     | MONITOR/KEYBOARD     |                  |
| INTERNATIONAL BUSINE | 1390702    | KEYBOARD             | 200.00           |
| GENRAD               | 1432P      | DECADE RESIST        | 154.00           |
| B & K INSTRUMENTS IN | 2426       | VOLTMETER AC         | 1,600.00         |
| B & K INSTRUMENTS IN | 2426       | VOLTMETER AC         | 1,600.00         |
| BEST POWER           | MD1KVA     | POWER SUPPLY         | 1,490.00         |

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| Manufacturer Name    | Model   | Description           | Acquisition Cost |
|----------------------|---------|-----------------------|------------------|
| HEWLETT PACKARD      | 721A    | POWER SUPPLY          | 147.40           |
| TEKTRONIX            | 200C    | SCOPE CART            | 125.00           |
| IBM                  | 5151    | MONITOR               |                  |
| TRIPLETT             | 601     | VOM                   | 166.00           |
| FLUKE                | 853A    | MULTIMETER            | 431.65           |
| FLUKE                | 2190A   | DIGTHERMOMETER        | 1,045.00         |
| HEWLETT PACKARD      | 59501A  | POWER SUPPLY          | 544.50           |
| HEWLETT PACKARD      | 651A    | TESTOSCILLATOR        | 599.00           |
| LASER PRECISION      | RL3610  | POWER METER           | 1,000.00         |
| RUSKA                | 2413.5  | PRESSURE CELL         | 300.00           |
| FREED                | IT-4    | ISOLAT TRANS          | 31.95            |
| BOLEY                |         | LATHE                 | 3,000.00         |
| DATAMETRICS          | 571D-10 | PRESS SENSOR          | 1,254.00         |
| TEKTRONIX            | 184     | TIME MARK GEN         | 760.00           |
| KEITHLEY             | 130     | MULTIMETER            | 104.52           |
| GENRAD               | 1454A   | DECADE DIVIDER        | 600.00           |
| SMITH                | H102F   | REGULATOR             | 65.00            |
| GENRAD               | W5MT3A  | VARIAC                | 95.00            |
| BLACK & WEBSTER      | WHD-47  | WELDER, ELECTRONIC    | 638.00           |
| KEITHLEY             | 130     | DMM                   | 115.00           |
| KROHN HITE           | 3343    | BND PASS FILTR        | 2,337.19         |
| SIMPSON              | 260     | MULTIMETER            | 50.00            |
| B & K INSTRUMENTS IN | 4134S   | MICROPHONE            | 300.00           |
| RACAL DANA           | 9478    | FREQUENCY STANDARD    | 1,872.00         |
| HEWLETT PACKARD      | 415E    | SWR METER             | 2,166.00         |
| B & K INSTRUMENTS IN | 4220    | MIC CALIBRATOR        | 461.87           |
| IBM                  | 5170    | PERSONAL COMPUTER     | 5,496.00         |
| FISHER SCIENTIFIC    | 109611  | VAC PUMP              | 148.00           |
| FLUKE                | 8000A   | DIG VOLTMETER         | 338.53           |
| HEWLETT PACKARD      | 6102A   | POWER SUPPLY          | 351.45           |
| TEKTRONIX            | 2A60    | PREAMPLIFIER          | 105.00           |
| WELCH                | 1402    | VACUUM PUMP           | 342.50           |
| HEWLETT PACKARD      | 562A16C | INPUT CABLE           | 50.00            |
| BROWN & SHARPE       | 942     | MACHINIST KIT         | 235.00           |
| CONSOLIDATED CONTROL | 5-124   | OSCILLOGRAPH          | 5,967.30         |
| HEWLETT PACKARD      | 9816S   | COMPUTER DESKT        | 3,809.15         |
| RUSKA                | 2416.5  | PRES INDICATOR        | 1,155.00         |
| HEWLETT PACKARD      | 723A    | POWER SUPPLY          | 233.45           |
| ELECTRO INTERNATIONA | PLT1/PP | POWER SUPPLY          | 2,030.00         |
| HEWLETT PACKARD      | 46      | CALCULATOR            | 757.95           |
| BEHLMAN              | 3-10A   | POWER SUPPLY          | 1,690.00         |
| HEWLETT PACKARD      | 8445A   | PRESELECTOR           | 528.00           |
| DAYTON               | 2Z379   | BATTERY CHARG         | 82.97            |
| TEKTRONIX            | 5103N   | OSCILLOSCOPE          | 1,328.90         |
| FUJITSU              | FKB2930 | KEYBOARD              | 99.00            |
| ECTRON               | 1120    | THERMOCOUPLE CALIBRA  | 4,560.00         |
| SIMPSON              | 160     | METER                 | 60.72            |
| B & K INSTRUMENTS IN | SQ630   | POWER SUPPLY          | 1,003.00         |
| B & K INSTRUMENTS IN | 4133/S  | MICROPHONE            | 447.00           |
| B & K INSTRUMENTS IN | 2426    | VOLTMETER AC          | 1,600.00         |
| NEMS CLARK           | 1302A   | RECEIVER              | 400.00           |
| PENN AIRBORNE        | 9A5119  | STANDARD RESISTOR, IO | 810.00           |

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|----------------------|----------|--------------------|---------------------|
| RACAL DANA           | 1995     | COUNTER, FREQUENCY | 3,600.00            |
| POTTER               | 1 1/4    | EXTRACTOR TOOL     | 25.00               |
| NASA                 | K24      | CONTROL BOX        | 50.00               |
| RUSKA                | 2416     | PRES MEA SYST      | 2,505.00            |
| SIMPSON              | 260-6    | VOM                | 60.28               |
| BROOKS               | 1051A    | FLOW CALIBRA.      | 12,432.42           |
| TEKTRONIX            | 7A19     | PREAMPLIFIER       | 800.25              |
| FLUKE                | 23       | MULTIMETER         | 140.00              |
| PLANTRONICS          | HSB552-1 | HEAD PHONES        | 113.33              |
| ETHERNET             | LE050A   | TRANSCEIVER        | 323.28              |
| PLANTRONICS          | SUPRA    | HEADPHONES         | 100.00              |
| GATEWAY              | PMV1448  | COMPUTER           | 300.00              |
| ETHERNET             | LE050A   | TRANSCEIVER        | 323.28              |
| TEKTRONIX            | 475      | SCOPE              | 3,128.28            |
| NICOLET              | 3091     | OSCILLOSCOPE       | 5,184.00            |
| DRUCK                | DPI/40   | INDICATOR          | 3,470.00            |
| DYNISCO              | 1000     | CALIBRATOR         | 1,875.00            |
| RUBICON              | 15A      | RESISTOR           | 65.00               |
| HEWLETT PACKARD      | 8444A    | GENERATOR          | 3,341.25            |
| ELIS                 | PHVD     | VOLTAGE DIVIDE     | 2,996.00            |
| BLACK & DECKER       | 255S     | HVY DTY SAW        | 29.99               |
| TRIPLETT             | 310      | VOLT OHM METER     | 62.00               |
| DATAPULSE            | 101      | PULSE GENERAT.     | 410.00              |
| B & K INSTRUMENTS IN | 2804     | POWER SUPPLY       | 962.00              |
| EPSON                | P70RA    | DIGITAL PRINTER    | 300.00              |
| KEYTRONIC            | E03435   | KEYBOARD           | 85.00               |
| HEWLETT PACKARD      | 3455A    | DIG. VOLTMETER     | 2,968.00            |
| HEWLETT PACKARD      | 350D     | ATTENUATOR         | 165.00              |
| KEYTRONIC            | E03435   | KEYBOARD           | 85.00               |
| MKS                  | 390HA    | PRESSURE SENSOR    | 9,280.00            |
| GUILDLINE            | 4410     | VOLTAGE STANDARD   | 7,860.00            |
| TEKTRONIX            | 422      | OSCILLOSCOPE       | 1,636.50            |
| B & K INSTRUMENTS IN | 2619     | PREAMPLIFIER       | 442.00              |
| GENRAD               | 1454A    | DEC VOLT DIV       | 161.00              |
| AMBER                | 4400A    | AUDIO TEST SET     | 6,295.00            |
| HEWLETT PACKARD      | 3441A    | RANGE SELECT       | 41.50               |
| AMTHOR               |          | DEAD WEIGHT TE     | 418.00              |
| FLUKE                | 77       | DIGITAL MULTIMETER | 143.10              |
| RUSKA                | 6000-15  | MANOMETER          | 5,500.00            |
| COMPUADD             | A000     | COMPUTER           | 1,688.00            |
| B & K INSTRUMENTS IN | 2804     | PWR. SUPPLY, MIC   | 988.95              |
| HEWLETT PACKARD      | 9830A    | CALCULATOR         | 12,000.00           |
| KEITHLEY             | 10/11    | HI MEG RES STD     | 132.50              |
| RUSKA                | 801-00   | HAND PUMP          | 705.00              |
| TEKTRONIX            | TM504    | POWER MODULE       | 315.00              |
| QUICK SET            | 3        | TRIPOD             | 28.80               |
| GENRAD               | 1562A    | SOUND LEV CAL      | 195.00              |
| HEWLETT PACKARD      | 7470A    | PLOTTER            | 1,116.00            |
| FLUKE                | 732A     | STANDARD, E        | 3,055.00            |
| OKIDATA              | 92       | DIG PRINTER        | 539.00              |
| TELEVIDEO SYSTEMS    | 955      | TERMINAL, COMPUTER | 478.50              |
| ARGO SYSTEMS         | AS210-1  | CALIBRATOR         | 5,090.00            |



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|----------------------|------------|----------------------|---------------------|
| TEKTRONIX            | K          | PLUG IN AMP          | 147.00              |
| KEITHLEY             | 130        | MULTIMETER           | 104.52              |
| FLUKE                | 8842A      | DIGITAL MULTIMETER   | 1,070.57            |
| MOTOROLA             | 01-P02690N | RADAR TRANSCEIVER    | 15,780.00           |
| EPSON                | P70RA      | DIGITAL PRINTER      | 300.00              |
| B & K INSTRUMENTS IN | 4132       | MICROPHONE           | 250.00              |
| GENRAD               | 1382       | GENERATOR            | 608.85              |
| HEWLETT PACKARD      | 312A       | WAVE ANALYZER        | 3,912.16            |
| HEWLETT PACKARD      | 200CDR     | OSCILLATOR           | 225.00              |
| F & P                | 10C1505    | FLOW METER           | 307.00              |
| SIMPSON              | 260-6      | VOM                  | 60.28               |
| FLUKE                | 732A       | STAND. CALIBRA       | 2,845.00            |
| WALLACE & TIERNAN    | FU3818     | STANDARD BAR         | 178.00              |
| B & K INSTRUMENTS IN | 4134/S     | MICROPHONE           | 447.00              |
| IWATSU               | SS05710D   | OSCILLOSCOPE         | 1,398.99            |
| IWATSU               | SS-5711D   | OSCILLOSCO           | 1,749.62            |
| IWATSU               | SS-5711D   | OSCILLOSCOPE         | 1,749.62            |
| THERMO ELECTRIC      | 31157      | TEMPERATURE CALIBRAT | 2,275.00            |
| GENERAL EASTERN      | 1311XR     | SENSOR, HYGROMETER   | 3,500.00            |
| HEWLETT PACKARD      | 9835A      | COMPUTER             | 12,013.00           |
| TRIPLETT             | 310        | VOLT OHM METER       | 49.68               |
| TEKTRONIX            | 323        | OSCILLOSCOPE         | 965.12              |
| ORTEC                | 401A       | POWER SUPPLY         | 900.00              |
| TEKTRONIX            | 015-0361-0 | CURRENT LOOP POD     | 481.60              |
| L & N                | 4025B      | STD. RESISTOR        | 150.00              |
| TEKTRONIX            | 7A26       | PREAMPLIFIER         | 1,062.15            |
| HEWLETT PACKARD      | 334A       | ANALYZER             | 1,467.18            |
| QSC                  | 1100       | AMPLIFIER            | 398.00              |
| ANDERSON JACOBEN     | A242       | COUPLER              | 200.00              |
| COMPUADD             | A000       | COMPUTER             | 1,688.00            |
| HEWLETT PACKARD      | 3325A      | SYNTHESIZER          | 3,458.00            |
| GENRAD               | 1482A      | STD INDUCTOR         | 150.00              |
| L & N                | 4399       | VOLT DIVIDER         | 3,778.40            |
| HEWLETT PACKARD      | 10529A     | LOGIC TESTER         | 1,220.18            |
| FLUKE                | 77         | DIGITAL MULTIMETER   | 130.00              |
| FLUKE                | 77         | DIGITAL MULTIMETER   | 143.10              |
| MILLIKEN             |            | CAMERA TOOLSET       | 250.00              |
| HONEYWELL            | 194        | RECORDER             | 378.75              |
| TEKTRONIX            | 454A       | OSCILLOSCOPE         | 3,104.00            |
| SIMPSON              | 260-6      | VOM                  | 60.28               |
| B & K INSTRUMENTS IN | 4134S      | MICROPHONE           | 300.00              |
| B & K INSTRUMENTS IN | 4220       | MIC CALIBRATOR       | 461.87              |
| TEKTRONIX            | 7B92       | PREAMPLIFIER         | 1,400.00            |
| B & K INSTRUMENTS IN | 2426       | RMS VOLTMETER        | 1,640.64            |
| MARQUETE             |            | WELDING TOOLS        | 139.50              |
| KEITHLEY             | 10/12      | HI MEG RES STD       | 132.50              |
| GENRAD               | 1432P      | DECADE RES           | 154.00              |
| GRALAB               | 168        | TIMER                | 27.00               |
| GENRAD               | W20MT3A    | VARIAC               | 140.00              |
| FISHER SCIENTIFIC    | 1096V1     | VAC PUMP             | 162.00              |
| HEWLETT PACKARD      | 334A       | DISTORTION ANALYZER  | 867.00              |
| GENRAD               | 1304B      | OSCILLATOR           | 960.00              |

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|----------------------|------------|----------------------|------------------|
| B & K INSTRUMENTS IN | 4230       | MIKE CALIBRA         | 177.00           |
| NOBATRON             | E65        | POWER SUPPLY         | 196.74           |
| TEKTRONIX            | 547        | SCOPE                | 1,885.97         |
| TEKTRONIX            | 7B92A      | PREAMPLIFIER         | 1,430.25         |
| TEKTRONIX            | TG501      | GENERATOR            | 1,592.25         |
| HASTINGS             | VT-6       | VACUUM GAUGE         | 180.00           |
| HEWLETT PACKARD      | 3478A      | DIG MULTIMETER       | 1,248.00         |
| GENRAD               | 1203B      | POWER SUPPLY         | 55.00            |
| KISTLER              | 621        | PRES TRANS ADP       | 25.00            |
| COMPUADD             | 51086      | MONITOR              | 334.00           |
| L & N                | 9828-2     | GALVANOMETER         | 553.85           |
| B & K INSTRUMENTS IN | 2426       | VOLTMETER AC         | 1,600.00         |
| WELCH                | 8915A      | PUMP, VACUUM         | 1,412.79         |
| NASA                 | NONE       | EQUIPMENT RACK       | 50.00            |
| TEKTRONIX            | 602        | CRT DISPLAY          | 1,042.75         |
| ACOUSTIC POWER SYSTE | 114        | PWR. AMPLIFIER       | 1,175.00         |
| DATAMETRICS          | 1015       | SIGNAL COND.         | 1,740.00         |
| DAYTON               | 3Z574      | EXHAUSTER            | 421.00           |
| SENCORE              | SC61       | WAVE ANALYZER        | 2,725.45         |
| HEWLETT PACKARD      | 8552B      | IF SECTION           | .00              |
| MENSOR               | 1000       | READOUT              | 7,675.00         |
| GENRAD               | 1209B      | OSCILLATOR           | 261.95           |
| DELL                 | 200        | COMPUTER, PERSONAL   | 1,772.00         |
| UNHOLTZ DICKIE       | CC350      | COMPUTER             | 3,000.00         |
| TEKTRONIX            | TG501      | GENERATOR            | 462.00           |
| BONITRON             | NONE       | CALIBRATOR, MIC      | 17,185.00        |
| SHALLCROSS           | 6862       | RESISTANCE BOX       | 212.00           |
| HEWLETT PACKARD      | 33440A     | DIGITAL PRINTER      | 1,738.65         |
| CRAFTSMAN            |            | FLARING TOOL         | 10.29            |
| SCOTT SPECIALTY GASE | 11A        | REGULATOR, PRESSURE  | 182.00           |
| PS TOOLS             |            | SERVOWRITER, FIXED D | 5,000.00         |
| HEWLETT PACKARD      | 5245L      | FREQ. COUNTER        | 4,207.50         |
| HEWLETT PACKARD      | 3310A      | FUNC. GEN            | 727.65           |
| GENRAD               | 1409-Y     | STD. CAPACITOR       | 500.00           |
| FLUKE                | 8800A      | DIG MULTIMETER       | 972.69           |
| TEKTRONIX            | 067-508    | AMPLITUDE CALI       | 1,100.00         |
| NUCLEAR              | 2612       | GEIGER COUNTER       | 299.07           |
| HEWLETT PACKARD      | 11042A     | PROBE T CONN         | 50.00            |
| DI-ACRO              | 4          | HAND SHEARS          | 1,230.00         |
| KEITHLEY             | 130A       | DIG MULTIMETER       | 113.90           |
| HEWLETT PACKARD      | 721A       | POWER SUPPLY         | 147.20           |
| DA LITE              | 50         | SCREEN               | 31.96            |
| STANDARD             | MCH-4095N  | MONITOR              | 470.00           |
| DRESSER              | 710A       | PRESS.INDICATO       | 1,260.00         |
| KISTLER              | 566        | ACCEL AMP            | 460.00           |
| ELECTRONIC DEVELOPME | MV100N     | DC STANDARD          | 745.00           |
| SPECTRAL DYNAMICS    | SD332      | TRANSLATOR           | 3,136.00         |
| PAROSCIENTIFIC       | 2100A      | QUARTZ GAUGE         | 2,350.00         |
| TEKTRONIX            | 0150135    | CURRENT PROBE        | 326.00           |
| REALISTIC            | 12755      | RECEIVER             | 80.00            |
| HEWLETT PACKARD      | 612A       | GENERATOR            | 1,212.16         |
| MAGNAVOX             | CM8562074G | DISPLAY, COMPUTER    | 500.00           |

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|----------------------|-----------|----------------------|------------------|
| APPLE                | M0116     | KEYBOARD             | 85.00            |
| HEWLETT PACKARD      | 35731A    | DISPLAY, COMPUTER    | 796.00           |
| STANDARD             | MCH-4095N | MONITOR              | 475.00           |
| HEWLETT PACKARD      | 3444A     | MULTI PLUG-IN        | 575.00           |
| GREINER ELEC         | LTP       | TIMER                | 549.50           |
| FLUKE                | 23        | DIGITAL MULTIMETER   | 143.00           |
| FLUKE                | 5101B     | VOLTAGE CALIB        | 11,746.00        |
| TEKTRONIX            | M         | PLUG IN              | 525.00           |
| TEKTRONIX            | FG504     | FUNCTION GEN         | 1,497.00         |
| BECKMAN              | 3010      | MULTIMETER           | 120.00           |
| B & K INSTRUMENTS IN | 4134S     | MICROPHONE           | 300.00           |
| VISHAY               | 1301      | DECADE RESIS         | 265.00           |
| FLUKE                | 77        | MULTIMETER           | 135.00           |
| FLUKE                | 77        | MULTIMETER           | 135.00           |
| KAYE INSTRUMENTS     | K140-4    | JUNCTION BOX         | 594.00           |
| KEITHLEY             | 181       | DIGITAL VOLTMETER    | 3,067.20         |
| MKS                  | 270B      | SIGNAL CONDITIONER   | 2,725.00         |
| PAROSCIENTIFIC       | 600B      | PRESSURE COMPUTER    | 3,903.00         |
| MONTEREY RESEARCH    | 731       | PROGRAMMER           | 50.00            |
| MAX TECH             | PB64      | BUFFER               | 89.00            |
| ENDEVCO              | 2225      | ACCELEROMETER        | 366.00           |
| HEWLETT-PACKARD      | 33449A    | PRINTER              | 1,677.00         |
| FLUKE                | 2190A1    | DIGITAL THERMOMETER  | 1,085.00         |
| ISOTECH              | 962       | THERMOMETER          | 3,500.00         |
| PSI                  | 8400-SP   | PRESSURE MEASURING S | 11,220.00        |
| TEKTRONIX            | 012066    | EXT CABLE            | 50.00            |
| ECTRON               | 1100CF    | CALIBRATOR           | 2,774.40         |
| FLUKE                | 8800A     | DIG MULTIMETER       | 955.45           |
| TELEDYNE             | VT-6B     | VACUUM GAGE          | 245.00           |
| CEL INSTRUMENTS      | 213       | NOISE GENERATOR      | 611.13           |
| BECKMAN              | 905       | WWV RECEIVER         | 555.00           |
| MODCOMP              | CL32187   | DIGITAL COMPUTER     | 114,345.00       |
| PLATO                | V-125     | DESOLDERING TOOL     | 395.00           |
| FAIR MO              | 5901      | WEIGHT SCALE         | 127.50           |
| INTERNATIONAL BUSINE | 1390702   | KEYBOARD             | 200.00           |
| HEWLETT PACKARD      | 5489A     | PASS FILTER          | 425.00           |
| POTTER               | 1-3/4     | EXTRACTOR TOOL       | 50.00            |
| POTTER               | 2-1 1/2   | EXTRACTOR TOOL       | 50.00            |
| COMPAQ               | DP386/332 | COMPUTER W/KEYBOARD  |                  |
| HEWLETT PACKARD      | 400E      | AC VOLTMETER         | 287.12           |
| BARNES               | FCS-1     | BLACKBODY            | 195.00           |
| HEWLETT PACKARD      | 7470A     | PLOTTER DIGIT        | 799.00           |
| HYPERION             | HI 128    | TIME CODE GEN.       | 3,695.00         |
| FLUKE                | 5440A     | CALIBRATOR           | 12,302.50        |
| WEINSCHEL            | VM-3      | SIGNAL CALIBRA       | 9,807.80         |
| GENRAD               | 1403-K    | STD CAPACITOR        | 85.00            |
| HEWLETT PACKARD      | 11097-A   | R F DETECTOR         | 31.12            |
| CEL INSTRUMENTS      | 213       | NOISE GENERATOR      | 611.13           |
| TELEDYNE             | VT-6B     | VACUUM GAGE          | 245.00           |
| SYSTRON-DONNER       | 8150      | TIME CODE GENERATOR  | 3,500.00         |
| SEARS                | 9H22582   | SANDER BELT          | 75.00            |
| TEKTRONIX            | P6013     | PROBE                | 325.00           |

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|----------------------|----------|---------------------|------------------|
| JEBCO                | NONE     | CABINET             | 50.00            |
| FLUKE                | 931B     | VOLTMETER           | 965.15           |
| TENNEY               | TH5-SPL  | HUMIDITY CHMBR      | 13,800.00        |
| KLINGER              | CC1-1    | CONTROL ROTATE      | 2,700.00         |
| ENDEVCO              | 2718A    | AMPLIFIER           | 800.00           |
| MAGNAVOX             | 7BM623   | DISPLAY, COMPUTER   | 500.00           |
| SIMPSON              | 260      | V O M               | 54.00            |
| HEWLETT PACKARD      | 5300A    | COUNTER             | 715.00           |
| HEWLETT PACKARD      | 416B     | RATIO METER         | 602.16           |
| HEWLETT PACKARD      | 493A     | MICROWAVE AMP       | 2,911.81         |
| RACAL DANA           | 9478     | STANDARD, FREQUENCY | 1,872.00         |
| HONDA                | EX5500   | GASOLINE GENERATOR  | 2,293.00         |
| B & K                | 2426     | VOLTMETER AC        | 1,600.00         |
| B & K                | 4133     | MICROPHONE          | 900.00           |
| AMDEK                | 300A     | TERMINAL            | 139.00           |
| PRINTRONIX           | P600     | PRINTER             | 7,737.75         |
| HEWLETT PACKARD      | 31E      | CALCULATOR          | 42.50            |
| MONITOR SYSTEM       | 820      | SIMULATOR PCM       | 7,785.00         |
| YAMAHA               | KM802    | MIXER, AUDIO        | 275.00           |
| IWATSU               | SS-5710D | OSCILLOSCOPE        | 1,398.99         |
| BELL & HOWELL        | 2H5340   | OSCIORAPHRACK       | 125.00           |
| TEKTRONIX            | 464      | SCOPE               | 3,501.70         |
| BINKS                | 331030   | AIR COMPRESSOR      | 516.60           |
| GENRAD               | W5MT3    | AUTOTRANSFORMR      | 80.00            |
| WALLACE & TIERNAN    | FA160    | PRESS GAUGE         | 171.00           |
| GSE                  |          | LOCKER              | 41.40            |
| HEWLETT PACKARD      | 9866A    | PRINTER             | .00              |
| B & K INSTRUMENTS IN | 4134     | MICROPHONE          | 210.00           |
| FLUKE                | 8000A    | DIG VOLTMETER       | 338.53           |
| TEKTRONIX            | 212      | OSCILLOSCOPE        | 703.25           |
| B & K                | 4134     | MICROPHONE          | 908.00           |
| SNAP ON TOOLS        | TQ3      | TORQUE WRENCH       | 44.00            |
| RALMIKES             | 045-2142 | MICROMETERS         | 480.00           |
| INTERNATIONAL BUSINE | 1390702  | KEYBOARD            | 200.00           |
| TEKTRONIX            | 1A1      | PREAMPLIFIER        | 650.00           |
| TEKTRONIX            | 335      | OSCILLOSCOPE        | 2,462.40         |
| FLUKE                | 510A-01  | VOLT CALIBRA.       | 1,435.20         |
| B & K INSTRUMENTS IN | 2426     | VOLTMETER AC        | 1,600.00         |
| ENDEVCO              | 2225     | ACCELEROMETER       | 366.00           |
| GENERAL ELECTRIC     | 7387-54  | STANDARD LAMP       | 50.00            |
| TEKTRONIX            | 874K     | CAPACITOR COUP      | 12.00            |
| KAYE INSTRUMENTS     | K 140-4  | JUNCTION BOX        | 895.00           |
| GENRAD               | W5MT3A   | VARIAC              | 95.00            |
| IBM                  | 5133     | MONITOR             | 544.00           |
| K & E                |          | LEORY SET           | 87.28            |
| B & K INSTRUMENTS IN | 2619     | PREAMPLIFIER        | 250.00           |
| HEWLETT PACKARD      | 9122D    | DISK DRIVE          | 912.00           |
| ARGO SYSTEMS         | AS210-4  | GENERATOR           | 4,775.00         |
| TEKTRONIX            | 5B12N    | TIME BASE           | 227.50           |
| HONEYWELL            | 101      | TAPE RECORDER       | 30,085.00        |
| MAGNAVOX             | 7BM623   | DISPLAY, COMPUTER   | 500.00           |
| PSI                  | CV-32L   | LEAK CHECK VALVE    | 1,100.00         |

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|----------------------|------------|----------------------|------------------|
| KEITHLEY             | 10/9       | HI MEG RES STD       | 132.50           |
| HEWLETT PACKARD      | 6102A      | POWER SUPPLY         | 351.45           |
| B & K INSTRUMENTS IN | 4133/S     | MICROPHONE           | 447.00           |
| VERIFLO              | 4130080    | REGULATOR            | 135.00           |
| PLANTRONICS          | SUPRA      | HEADPHONES           | 100.00           |
| TEKTRONIX            | TM503      | POWER MODULE         | 250.00           |
| KEITHLEY             | 177        | MULTIMETER           | 584.00           |
| TEKTRONIX            | SG502      | OSCILLATOR           | 363.75           |
| GUILDLINE            | 9520       | TERAOHMMETER         | 3,665.00         |
| KEITHLEY             | 5155       | MEGOHM STD           | 525.00           |
| MICROMATCH           | 712B       | WATTMETER            | 141.52           |
| HEWLETT PACKARD      | 5261A      | VIDEO AMP.           | 325.00           |
| L & N                | 4360       | SHUNT                | 432.50           |
| DBA                  | 210        | BLACK BODY           | 2,495.00         |
| STEARNS              | 12X18      | SURFACE PLATE        | 30.00            |
| WYSE                 | WY-60-01-0 | TERMINAL, COMPUTER   | 317.00           |
| WYSE                 | WY-60-01-0 | TERMINAL, COMPUTER   | 317.00           |
| GENERAL ELECTRIC     | 7421-29    | STANDARD LAMP        | 50.00            |
| TEKTRONIX            | 503        | OSCILLOSCOPE         | 640.00           |
| HEWLETT PACKARD      | 431B       | POWER METER          | 450.00           |
| TEKTRONIX            | 284        | PULSE GENERATO       | 873.00           |
| FLUKE                | 77         | DIGITAL MULTIMETER   | 107.10           |
| RUSKA                | 6211-804-7 | DIGITAL PRESSURE GAG | 3,980.00         |
| MOTOROLA             | 01-P02690N | RADAR TRANSCEIVER    | 15,780.00        |
| MOTOROLA             | 01-P02690N | RADAR TRANSCEIVER    | 9,208.00         |
| BALDWIN LIMA HAMILTO | 626        | ST GAGE CALIB        | 265.00           |
| MAX TECH             | PB64       | BUFFER               | 89.00            |
| STANDARD ELECTRIC    |            | TIMER                | 55.50            |
| GLOBAL               | NONE       | MAG TAPE STORAGE RAC | 790.00           |
| KISTLER              | 303T       | ACCEL, ANG PR        | 750.00           |
| HEWLETT PACKARD      | 410C       | VOLTMETER            | 427.00           |
| TEKTRONIX            | D          | PLUG IN AMP          | 172.00           |
| KLINGER              | UP100PP    | ROTATION STAGE       | 2,397.00         |
| B & K INSTRUMENTS IN | 2619       | PREAMPLIFIER         | 442.00           |
| B & K INSTRUMENTS IN | 2619       | PREAMPLIFIER         | 442.00           |
| B & K INSTRUMENTS IN | 2619       | PREAMPLIFIER         | 442.00           |
| WEINSCHEL            | 436A       | SIG. GENERATOR       | 1,189.00         |
| WYLE                 | 5GPM       | LOW FLOW CONS.       | 500.00           |
| HI-TEK               | RT-101     | KEYBOARD             | 90.00            |
| HEWLETT PACKARD      | 410B       | VOLTMETER            | 250.96           |
| DATAMETRICS          | 571D-10    | PRESS SENSOR         | 1,372.75         |
| TEKTRONIX            | PG501      | PULSE GEN            | 339.50           |
| HEWLETT PACKARD      | 9862A      | PLOTTER              | 2,875.20         |
| GENRAD               | 1304B      | OSCILLATOR           | 960.00           |
| FLUKE                | 77         | DIGITAL MULTIMETER   | 107.10           |
| ALUMA TOWER          | TM51-20T11 | TRAILER, TOWER       | 8,270.00         |
| FLUKE                | 8300A      | VOLTMETER            | 2,701.45         |
| GENRAD               | W5MT3A     | VARIAC               | 95.00            |
| PYREX                | 2982       | CYLINDER             | 30.00            |
| PLANTRONICS          | SUPRA      | HEADPHONES           | 100.00           |
| TELEVIDEO            | 922        | TERMINAL W/KEYBOARD  |                  |
| EPSON                | P70RA      | DIGITAL PRINTER      | 300.00           |

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| Manufacturer Name    | Model      | Description          | Acquisition Cost |
|----------------------|------------|----------------------|------------------|
| COMPUADD             | 286        | MICRO COMPUTER       | 1,128.00         |
| HEWLETT PACKARD      | 626A       | SIG. GENERATOR       | 3,416.81         |
| B & K                | 4134       | MICROPHONE           | 900.00           |
| K & E                | MR II      | DISTANCE MEASU.      | 2,000.00         |
| UNITEK               | 1048A      | WELDMATIC            | 743.70           |
| B & K INSTRUMENTS IN | 2426       | VOLTMETER AC         | 1,600.00         |
| TEKTRONIX            | 067-068    | CALIB.FIXTURE        | 547.00           |
| INTERNATIONAL BUSINE | 1390702    | KEYBOARD             | 200.00           |
| HEWLETT PACKARD      | 200CD      | OSCILLATOR           | 207.75           |
| MKS                  | 2155       | SIGNAL CONDIT        | 700.00           |
| W A STEWARD          | 100 MAG    | ROL-A-CHART          | 125.10           |
| GENRAD               | W5MT3A     | VARIAC               | 95.00            |
| MENSOR               | 10190      | MANOMETER            | 3,700.55         |
| HEWLETT PACKARD      | 400E       | AC VOLTMETER         | 287.12           |
| EDC CORPORATION      | MV-106     | VOLTAGE STANDARD     | 1,697.50         |
| SMITH MFG CO         | SM02805    | PRINTER STAND        | 85.00            |
| B & K INSTRUMENTS IN | 4133/S     | MICROPHONE           | 447.00           |
| TRANSISTOR DEVICES   | DLR-130-5- | DYNA-LOAD            | 497.00           |
| VEECO                | MS9        | LEAK DETECTOR        | 5,492.00         |
| MKS                  | 390HA      | PRESSURE SENSOR      | 9,280.00         |
| LEAR SIEGLER         | ADM3A      | MONITOR              |                  |
| FLUKE                | 931B       | VOLTMETER RMS        | 1,045.00         |
| HASTINGS             | LV-1X      | VAC GAUGE            | 350.00           |
| DATAMETRICS          | 699        | POWER SUPPLY         | 570.00           |
| SHALLCROSS           | 6863       | PREC RES DECAD       | 190.00           |
| HEWLETT PACKARD      | 5532A      | COUNTER              | 550.00           |
| TEKTRONIX            | 323        | OSCILLOSCOPE         | 965.12           |
| WESTON               | 622        | MICROAMMETER         | 258.37           |
| HEWLETT PACKARD      | 6205       | POWER SUPPLY         | 643.50           |
| INSTRULAB            | 4202       | THERMOMETER, DIGITAL | 2,845.25         |
| GATEWAY              | PMV1448    | DISPLAY              | 300.00           |
| GENRAD               | W5MT3A     | VARIAC               | 95.00            |
| GENRAD               | W5MT3A     | VARIAC               | 95.00            |
| ETHERNET             | LE050A     | TRANSCEIVER          | 323.28           |
| HEWLETT PACKARD      | 618B       | SIGNAL GENERAT       | 2,268.60         |
| B & K INSTRUMENTS IN | 2619       | PREAMPLIFIER         | 442.00           |
| HEWLETT PACKARD      | 3400A      | VTVM                 | 528.00           |
| B & K INSTRUMENTS IN | 4134       | MICROPHONE           | 590.00           |
| DATAMETRICS          | 570DIT     | CAPACIT GAUGE        | 468.00           |
| B & K                | 2639       | PRE AMP              | 593.00           |
| HONEYWELL            | 101        | TAPE RECORDER        | 21,061.00        |
| B & K INSTRUMENTS IN | 2804       | POWER SUPPLY         | 443.29           |
| TEKTRONIX            | 335        | OSCILLOSCOPE         | 1,814.06         |
| TEKTRONIX            | 067-0616   | PLUG-IN EXTEND       | 695.00           |
| HEWLETT PACKARD      | 5253B      | PLUG IN COUNT        | 502.42           |
| GENRAD               | 1432P      | DECADE RESISTR       | 156.00           |
| B & K                | 4133       | MICROPHONE           | 900.00           |
| TEKTRONIX            | 1A1        | PLUG IN              | 650.00           |
| HEWLETT PACKARD      | 33440A     | PRINTER DIGITAL      | 1,739.00         |
| HEWLETT PACKARD      | 6102A      | PWR SUPPLY           | 362.15           |
| HENES MFG CO         | S          | WATER WELDER         | 285.00           |
| KEITHLEY             | 10/13      | HI MEG RES STD       | 132.50           |

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|----------------------|------------|---------------------|------------------|
| HAZELTINE            | 4DTD155207 | TERMINAL            | 1,833.00         |
| DATAMETRICS          | 571D-10    | PRESS SENSOR        | 1,254.00         |
| INTERNATIONAL BUSINE | 1390702    | KEYBOARD            | 200.00           |
| FLUKE                | 77         | DIGITAL MULTIMETER  | 107.10           |
| GENRAD               | 1521B      | LEVEL RECORDER      | 1,155.00         |
| TORIT                | 66         | DUST COLLECTOR      | 422.00           |
| B & K                | 2619       | PRE-AMP             | 600.00           |
| B & K                | 4133       | MICROPHONE          | 900.00           |
| EPSON                | FX286E     | DIGITAL PRINTER     | 562.00           |
| B & K                | 2639       | PREAMPLIFIER        | 600.00           |
| TRYGON               | HR36-5     | POWER SUPPLY        | 352.50           |
| HEWLETT PACKARD      | 334A       | DISTORT ANAL        | 866.80           |
| SAMSUNG              | SM-12SFA7  | MONITOR             | 95.00            |
| SENCORE              | VA62       | SIG. ANALYZER       | 2,965.50         |
| FLUKE                | 895A       | VOLTMETER, DIFF.    | 4,746.53         |
| ALUMA TOWER          | TM51-207T1 | TRAILER, TOWER      | 8,270.00         |
| APPLE                | A2S2064    | COMPUTER            | 772.00           |
| HEWLETT PACKARD      | 400E       | VOLTMETER           | 341.55           |
| GENERAL ELECTRIC     | 10         | RECEIVER            | 87.80            |
| TEKTRONIX            | 454        | SCOPE               | 3,115.50         |
| EMPIRE ABRAI         | P-50       | SANDBLASTER         | 100.00           |
| BOLEY                | 31047      | LATHE               | 1,107.00         |
| TEKTRONIX            | 3A6        | PREAMPLIFIER        | 550.00           |
| KODAK                | 2140       | MICROFICHE          | 3,035.08         |
| NEFF                 | 122        | AMPLIFIER           | 565.00           |
| HEWLETT PACKARD      | 428B       | MILLIAMMETER        | 606.65           |
| AMTHOR               | 452        | TESTER, DEAD WEIGHT | 532.00           |
| DO ALL               |            | BENCH GRINDER       | 97.00            |
| B & K INSTRUMENTS IN | 4134       | MICROPHONE          | 210.00           |
| HEWLETT PACKARD      | 3305A      | SWEEP PLUGIN        | 977.25           |
| B & K INSTRUMENTS IN | 2619       | PREAMPLIFIERS       | 442.00           |
| HEWLETT PACKARD      | 8401A      | AMPLIFIER           | 203.46           |
| BOONTON              | 102F       | SIG GENERATOR       | 5,359.25         |
| DO ALL               | G-R        | GAGE BLOCKS         | 58.50            |
| KEITHLEY             | 130A       | DIG MULTIMETER      | 113.90           |
| WELCH                | 1402       | VAC PUMP            | 342.50           |
| HEWLETT PACKARD      | 8011A      | PULSE GENERATR      | 1,085.63         |
| FLUKE                | 77         | MULTIMETER          | 140.00           |
| PLANTRONICS          | HSB552-1   | HEAD PHONES         | 113.33           |
| EPSON                | FX-286     | PRINTER, DIGITRAL   | 529.00           |
| EPSON                | JX80       | PRINTER, DIGITAL    | 698.28           |
| DIGITAL EQUIPMENT CO |            | LOOPBACK CONN.      | 539.00           |
| HEWLETT PACKARD      | 465A       | AMPLIFIER           | 191.54           |
| FLUKE                | 8020A      | MULTIMETER          | 182.00           |
| GENRAD               | W5MT3A     | VARIAC              | 95.00            |
| SMITH VICTOR         | 12U2       | STUDIO LIGHT        | 30.00            |
| B & K                | 4134       | MICROPHONE          | 900.00           |
| MEMOREX              | 800        | TESTER, DISK        | 6,000.00         |
| HEWLETT PACKARD      | 82906A     | DIG. PRINTER        | 572.00           |
| FLUKE                | 2190A      | DIGTHERMOMETER      | 1,045.00         |
| KEYTRONIC            | E03435     | KEYBOARD            | 85.00            |
| L & N                | 4210       | STD RESISTOR        | 500.00           |

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|----------------------|------------|----------------------|---------------------|
| LASER PRECISION      | CTX350     | LIGHT CHOPPER        | 700.00              |
| TEKTRONIX            | 067-074    | ANALYZER, BUS        | 1,250.00            |
| ROCHESTER            | 1848       | DIAL THERMOMET       | 25.00               |
| BROWN & SHARPE       |            | DIAL INDICATOR       | 26.25               |
| ESI                  | SR1010     | RESIST. STD.         | 715.00              |
| METTLER              | H20T       | BALANCE, ANALYTICAL  | 1,019.00            |
| APPLE                | A2M0044    | DISC, SUBSYSTEM      | 490.00              |
| MONTGOMERY WARD      | 8013       | FREEZER              | 229.00              |
| RUSKA                | 3893-801   | CONTROLLER           | 1,680.00            |
| COMPUADD             | 51086      | MONITOR              | 334.00              |
| GATEWAY              | PMV1448    | DISPLAY              | 300.00              |
| ETHERNET             | LE050A     | TRANSCEIVER          | 323.28              |
| DEC                  | 70-14653-0 | KEYBOARD             | 50.00               |
| B & K INSTRUMENTS IN | 2619       | PREAMPLIFIER         | 442.00              |
| BULOVA               | TR50       | CLEANER              | 165.00              |
| TEKTRONIX            | 7844       | OSCILLOSCOPE, DUAL B | 5,900.00            |
| HASTINGS             | SV1        | VAC GAGE             | 139.70              |
| WALLACE & TIERNAN    | FA145      | PRESS GAUGE          | 282.00              |
| B & K INSTRUMENTS IN | 2804       | POWER SUPPLY         | 733.53              |
| KEITHLEY             | 130A       | DIG MULTIMETER       | 113.90              |
| IPERIAL              | 400-FA     | FLARING TOOL         | 36.00               |
| B & K                | 2639       | PRE AMP              | 593.00              |
| UNITED DETECTOR      | S351F      | RADIOMETER           | 980.00              |
| FLUKE                | 823A       | AC DC DIF VMTR       | 1,220.00            |
| HEWLETT PACKARD      | 59301A     | CONVERTER            | 569.25              |
| KEITHLEY             | 130        | MULTIMETER           | 104.52              |
| B & K INSTRUMENTS IN | 830        | CAPACITA METER       | 300.00              |
| JARRETT INST.        | B-13       | TRIPLE POINT         | 658.00              |
| RUSKA                | 6000       | MANOMETER            | 9,883.60            |
| MINOLTA/LAND         | 152A       | THERMOMETER          | 2,789.00            |
| HEWLETT PACKARD      | 5011T      | LOGIC KIT            | 649.00              |
| HEWLETT PACKARD      | 400E       | VOLTMETER            | 341.55              |
| DO ALL               |            | BAND SAW             | 4,783.00            |
| BROWN & SHARPE       | 599        | MICROMETER           | 250.00              |
| NJE                  | CR6018D    | POWER SUPPLY         | 800.00              |
| RUSKA                | NONE       | AIR PISTON GA.       | 2,810.00            |
| FLUKE                | 77         | DIGITAL MULTIMETER   | 130.00              |
| ONO SOKKI            | CF360      | ANALYZER             | 16,055.00           |
| UNIMATION            |            | LATHE & ACCES.       | 381.75              |
| BRIDGEPORT           | VBA        | MILLING MACH         | 5,337.75            |
| L R                  | 1112HP     | FLEX GRINDER         | 60.00               |
| DEC                  | RX07       | DISK DRIVE           | 11,200.00           |
| B & K INSTRUMENTS IN | 2804       | PWR. SUPPLY, MIC     | 988.95              |
| TR10-TECH            | G-338-6    | ACCEL TABLE          | 10,000.00           |
| FLUKE                | 77         | MULTIMETER, DIG.     | 116.10              |
| B & K INSTRUMENTS IN | 4134/S     | MICROPHONE           | 447.00              |
| B & K INSTRUMENTS IN | 4134/S     | MICROPHONE           | 447.00              |
| ECD CORPORATION      | 100        | CAP METER            | 295.00              |
| B & K INSTRUMENTS IN | 4134       | MICROPHONE           | 210.00              |
| TRIPLETT             | 310        | VOLT OHM METER       | 49.68               |
| FLUKE                | 77         | DIGITAL MULTIMETER   | 130.00              |
| WESTON               | 2041       | MILLIAMMETER         | 42.00               |



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| Manufacturer Name    | Model      | Description          | Acquisition Cost |
|----------------------|------------|----------------------|------------------|
| TEKTRONIX            | 4014-1     | TERMINAL             | 12,558.00        |
| IBM                  | 5279       | MONITOR              |                  |
| TEKTRONIX            | 211        | OSCILLOSCOPE         | 528.65           |
| SYSTRON DONNER       | 8130       | TIMECODEREADER       | 4,434.50         |
| WAVETEK              | 164        | FUNC GENERATOR       | 2,095.00         |
| TEKTRONIX            | T922R      | OSCILLOSCOPE         | 1,136.81         |
| FLUKE                | 23         | MULTIMETER           | 140.00           |
| PLANTRONICS          | HSB552-1   | HEAD PHONES          | 113.33           |
| HEWLETT-PACKARD      | 3457A      | MULTIMETER           | 2,890.50         |
| DERBY                | 12         | LATHE                | 695.25           |
| AIR PRODUCTS         | C          | CYLINDER GAS         | 134.00           |
| B & K INSTRUMENTS IN | 2619       | PREAMPLIFIER         | 442.00           |
| UNION CARBIDE        | PGS-45     | NITROGEN CONT.       | 1,785.00         |
| VEECO                | RG-3A      | VAC GAGE             | 573.00           |
| TEKTRONIX            | 564        | SCOPE AND CART       | 886.50           |
| PACIFIC MEASUREMENTS | 1044       | X Y RECORDER         | 2,070.00         |
| KEYTRONIC            | E03435     | KEYBOARD             | 85.00            |
| DOSIMETER            | 906-1      | CHARGER              | 200.00           |
| GERTSCH              | 1011       | DECADE VOLT DI       | 562.00           |
| TEKTRONIX            | 7871       | TIME BASE, DELAYING  | 775.00           |
| HEWLETT-PACKARD      | 16500A     | LOGIC STATE ANALYZER | 17,191.50        |
| KIMAX                | 1000 ML    | GRAD. CYLINDER       | 10.00            |
| TD                   | 4000 ML    | GRAD. CYLINDER       | 15.00            |
| HONEYWELL            | 1166       | SHUNT                | 70.00            |
| WELCH                | 1402       | VAC PUMP             | 342.50           |
| GSE                  |            | LOCKER               | 41.40            |
| BELL & HOWELL        | SR VIII    | READER               | 177.00           |
| KEITHLEY             | 177/1788   | DIGITAL MULTIMETER   | 745.00           |
| BALLANTINE           | 300G S/2   | VOLTMETER, AC        | 427.00           |
| GENRAD               | 1403-G     | STD CAPACITOR        | 85.00            |
| WEATHERTRONICS       | 5021       | HYGROTHERMOGRA       | 365.00           |
| COMPAQ               | 420T       | DISPLAY UNIT         |                  |
| LYNX                 | 470        | TESTER, FLOPPY DRIVE | 1,475.00         |
| PSI                  | 81-1FC     | INTERFACE UNIT       | 1,410.00         |
| MOTOROLA             | H99SA+053H | 2-WAY FM RADIO       | 1,262.00         |
| EPSON                | P70RA      | PRINTER              | 200.00           |
| SMITH MFG CO         | SM02805    | PRINTER STAND        | 85.00            |
| SMITH MFG CO         | SM02805    | PRINTER STAND        | 85.00            |
| HEWLETT PACKARD      | 11047A     | LOAD DIVIDER         | 25.00            |
| DRUCK                | DPI261     | PRESSURE INDICATOR   | 1,430.00         |
| TEKTRONIX            | 7B70       | DELAY TIME BASE      | 675.00           |
| HEWLETT-PACKARD      | 7440A      | PLOTTER              | 854.90           |
| TEKTRONIX            | 7A26       | PLUG-IN DUAL TIME BA | 1,050.00         |
| EPSON                | P70RA      | PRINTER              | 200.00           |
| HEWLETT-PACKARD      | 5245L      | COUNTER              | 3,000.00         |
| FLUKE                | 8842A      | DIGITAL MULTIMETER   | 1,395.00         |
| B & K INSTRUMENTS IN | 2804       | PWR. SUPPLY, MIC     | 988.95           |
| HASTINGS             | VT-6B      | VACUUM GAGE          | 215.00           |
| PAROSCIENTIFIC       | 215-A      | PRESSURE SENSO       | 2,050.00         |
| BELL & HOWELL        | ABR620     | READ. PRINTER        | 2,129.00         |
| HEWLETT PACKARD      | 3440A      | DVM                  | 1,304.75         |
| TEKTRONIX            | 465        | OSCILLOSCOPE         | 2,488.05         |

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|----------------------|------------|----------------------|------------------|
| GENRAD               | 1432-P     | DEC. RESISTOR        | 154.00           |
| FLUKE                | A90        | SHUNT                | 255.00           |
| TEKTRONIX            | RG501      | RAMP GENERATOR       | 175.00           |
| B & K                | 2426       | VOLTMETER            | 1,600.00         |
| QSC                  | 1100       | AMPLIFIER            | 398.00           |
| LEAR-SIEGLER         | ADM-11     | MONITOR/KEYBOARD     |                  |
| VAISALA              | HMI33      | TEMP/HUM. INDICATOR  | 1,286.00         |
| RACAL VADIC          | VA3413     | MODEM                | 580.00           |
| NEFF                 | 122-123    | D C AMPLIFIER        | 740.00           |
| CAMILE               | 22         | SHUTTER ANALY        | 995.00           |
| UNHOLTZ DICKIE       | 106A-1/2   | SHAKER, ELECTRODYNAM | 24,345.00        |
| WEINSCHEL            | AS-4       | ATTENUATOR SET       | 495.00           |
| KLINGER              | CC 1.1     | CONTROL              | 2,632.00         |
| PRO-LOG CORP         | M900B      | PROM PROGRAMMER      | 2,601.00         |
| L & N                | 4030B      | STD. RESISTOR        | 52.00            |
| GENRAD               | 1615-P1    | STD CAPACITOR        | 85.00            |
| CORREN               | 500        | TORQUE GAGE          | 50.00            |
| STOSS                |            | DIAL INDICATOR       | 125.00           |
| GENRAD               | W5MT3A     | VARIAC               | 95.00            |
| DEC                  | RX07       | DISK DRIVE           | 11,200.00        |
| ROSEMOUNT            | 912C       | FURNACE              | 17,000.00        |
| FLUKE                | 8060A      | DIGITAL MULTIMETER   | 351.00           |
| TELEVIDEO            | 9220       | MONITOR/KEYBOARD     |                  |
| DEC                  | VT100-AA   | MONITOR/KEYBOARD     |                  |
| LEAR-SIEGLER         | ADM3A      | MONITOR              |                  |
| DAYTON               | 2Z379      | BATTERY CHARG        | 82.97            |
| HEWLETT PACKARD      | 3455A      | VOLTMETER            | 3,366.00         |
| FLUKE                | 883AB      | VOLTMETER DIFFERENTI | 1,378.70         |
| SIMPSON              | 260        | V O M                | 54.00            |
| FLUKE                | 8020A      | DIG. MULTIMTR.       | 182.00           |
| ARGO SYSTEMS         | AS210      | CALIBRATOR FR        | 13,525.00        |
| WELCH                | 1402B      | VAC PUMP             | 405.00           |
| GENRAD               | 1650A      | IMP BRIDGE           | 450.00           |
| HEWLETT PACKARD      | 9830B      | CALCULATOR           | 10,815.74        |
| TEKTRONIX            | LA501      | LOGIC ANALYZER       | 4,074.00         |
| HEWLETT PACKARD      | 723A       | POWER SUPPLY         | 235.95           |
| B & K                | 2619       | PRE-AMP              | 600.00           |
| HEWLETT PACKARD      | 211A       | SQ WAVE GEN          | 313.11           |
| GENRAD               | 1163A      | SYNTHESIZER          | 5,606.50         |
| TEKTRONIX            | 221        | OSCILLOSCOPE         | 1,464.00         |
| B & K INSTRUMENTS IN | 2804       | POWER SUPPLY         | 443.29           |
| TEKTRONIX            | 7A26       | AMPLIFIER            | 1,388.36         |
| HEWLETT PACKARD      | 141T       | DISPLAY              | 12,902.95        |
| B & K INSTRUMENTS IN | 2209       | SOUNDLEVEL MTR       | 2,865.60         |
| HEWLETT PACKARD      | 8555A      | RF SECTION           | .00              |
| B & K                | 2426       | VOLTMETER            | 1,600.00         |
| IBM                  | 5151       | MONITOR, COMPUTER    |                  |
| IBM                  | 5150       | COMPUTER W/KEYBOARD  |                  |
| WYSE                 | 900128-02  | KEYBOARD             | 117.00           |
| FLUKE                | 5101A      | CALIBRATOR           | 10,758.81        |
| FLUKE                | 103A       | COMPARATOR           | 1,995.00         |
| MOTOROLA             | 01-P02690N | RADAR TRANSCEIVER    | 24,302.00        |

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|----------------------|------------|---------------------|------------------|
| DEC                  | VAX11/750  | COMPUTER            | 112,017.00       |
| NONE                 | NONE       | SENSITIVE BEAM      | 500.00           |
| HEWLETT PACKARD      | 467A       | RF POWER AMP        | 580.35           |
| EDC CORPORATION      | 520A-D     | STANDARD VOLT       | 5,645.00         |
| SHIBASOKU            | 925D       | METER, NOISE        | 10,500.00        |
| HEWLETT PACKARD      | 436A       | RF POWER METER      | 3,213.00         |
| HEWLETT PACKARD      | 11683A     | CALIBRATION METER   | 708.75           |
| TEKTRONIX            | 131        | CURRENT PROBE       | 275.00           |
| DEC                  | LA38       | TELEPRINTER         | 1,700.00         |
| RUSKA                | 6000       | MANOMETER           | 6,009.60         |
| TEKTRONIX            | 5A15N      | PREAMP              | 175.00           |
| B & K                | 2619       | PRE-AMP             | 600.00           |
| DIGITAL EQUIPMENT CO | 29-22193-0 | ALIGNMENT PACK      | 5,179.00         |
| HONEYWELL            | 101        | TAPE RECORDER       | 21,061.00        |
| HEWLETT PACKARD      | 6102A      | POWER SUPPLY        | 368.00           |
| GENRAD               | 1390B6     | NOISE GEN.          | 240.00           |
| STANDARD             | 4095       | MONITOR             | 470.00           |
| SIMPSON              | 260-6      | VOM                 | 60.28            |
| HEWLETT PACKARD      | 334A       | ANALYZER            | 945.50           |
| CVC                  | GM-100     | GAGE                | 180.00           |
| GLOBAL COMPUTER      | C-6323     | PRINTER STAND       | 149.00           |
| COMPUADD             | A000       | COMPUTER            | 1,226.00         |
| FLUKE                | 8088       | INTERFACE POD       | 4,490.00         |
| FLUKE                | 8060A      | DIG. MULTIMETER     | 349.00           |
| LASER PRECISION      | RKP360     | PROBE               | 700.00           |
| SIMPSON              | 160        | METER               | 60.72            |
| L & N                | 6011-3     | TEMP. CONTROL.      | 862.60           |
| HEWLETT PACKARD      | 3310A      | GENERATOR           | 589.05           |
| TRIPLETT             | 310        | VOLT OHM METER      | 49.68            |
| B & K                | 2639       | PRE AMP             | 593.00           |
| APPLE                | A2M0044    | DISC, SUBSYSTEM     | 530.00           |
| IRCON                | 3T06F      | TEMP. CONTROL       | 951.00           |
| B & K INSTRUMENTS IN | 4220       | MIC CALIBRATOR      | 461.87           |
| FLUKE                | 8842A      | VOLTMETER           | 909.15           |
| GENRAD               | W5MT3A     | VARIAC              | 95.00            |
| GENRAD               | W5MT3A     | VARIAC              | 95.00            |
| COMPUADD             | 286        | COMPUTER W/KEYBOARD | 1,749.00         |
| LEAR-SIEGLER         | ADM-11     | MONITOR/KEYBOARD    |                  |
| GENRAD               | 1203B      | POWER SUPPLY        | 65.00            |
| HEWLETT PACKARD      | 241A       | OSCILLATOR          | 492.64           |
| ATHENA               | 91Z-126    | POWER PACKAGE       | 235.00           |
| BELL & HOWELL        | SR VIII    | READER              | 177.00           |
| TEKTRONIX            | 2A63       | PLUG IN             | 152.00           |
| BELL & HOWELL        | SR VIII    | READER              | 177.00           |
| FLUKE                | PM3065     | OSCILLOSCOPE        | 1,745.00         |
| HEWLETT PACKARD      | K013440    | EXTENDER            | 5.00             |
| LINGAR               | 1095       | HEAT GUN            | 58.00            |
| SPECTRAL DYNAMICS    | SD104A     | OSCILLATOR SWP      | 2,215.00         |
| PACKARD BELL         | 1200       | MODEM               | 89.00            |
| KEITHLEY             | 177        | DIG. MULTIMETE      | 650.00           |
| SENCORE              | VC63       | VCR TESTER          | 359.45           |
| NICOLET              | 2090 III   | OSCILLOSCOPE        | 6,050.00         |

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|----------------------|-----------|----------------------|------------------|
| TEKTRONIX            | 7A16A     | WB AMPLIFIER PLUG IN | 1,334.75         |
| INTELLIGENT SYSTEMS  | 8001G     | TERMINAL             | 2,950.00         |
| B & K INSTRUMENTS IN | 2804      | POWER SUPPLY         | 160.00           |
| HEWLETT PACKARD      | 7046A     | PLOTTER              | 3,366.00         |
| HAZELTINE            | 1500      | TERMINAL             | 850.00           |
| APPLE                | A2M2010   | MONITOR              | 129.00           |
| HEWLETT PACKARD      | 9816S     | COMPUTER             | 3,854.00         |
| B & K                | 4133      | MICROPHONE           | 900.00           |
| GENRAD               | W5MT3A    | VARIAC               | 50.00            |
| IBM                  | 5278      | TERMINAL             |                  |
| HEWLETT PACKARD      | 400E      | VOLTMETER            | 341.55           |
| TELEVIDEO            | 970       | MONITOR/KEYBOARD     |                  |
| FLUKE                | 8000A     | DIG MULTIMETER       | 290.03           |
| FLUKE                | 8020A     | DIG. MULTIMTR.       | 182.00           |
| ELECTRONIC DEVELOPME | 501       | VOLT STD.            | 3,259.20         |
| TEKTRONIX            | TM-501    | POWER MODULE         | 125.00           |
| ZIA TECH CO.         | ZT488     | ANALYZER             | 449.00           |
| STANDARD             | MCH-4095N | MONITOR              | 470.00           |
| HEWLETT PACKARD      | 5004A     | ANALYZER             | 1,056.00         |
| SINGER               | 5010-1    | MICROWAVE AMP        | 3,832.00         |
| HEWLETT PACKARD      | 400E      | AC VOLTMETER         | 287.12           |
| PANAMETRICS          | 1000      | HYGROMETER           | 2,420.00         |
| GENRAD               | 1632A     | INDUCT BRIDGE        | 1,395.00         |
| WELCH                | 8814A     | VACUUM PUMP          | 1,140.00         |
| D & H INST           | PG-102    | GENERATOR, PRESSURE  | 3,365.00         |
| HEWLETT PACKARD      | 400E      | VOLTMETER            | 341.55           |
| TEKTRONIX            | 323       | OSCILLOSCOPE         | 1,398.04         |
| HEWLETT PACKARD      | 6255A     | POWER SUPPLY         | 650.00           |
| NUDATA               | 921-T2    | INTERFACE TEST SET   | 163.20           |
| L & N                | 8642      | OPTICAL PYROMETER    | 7,301.00         |
| ACOUSTIC POWER SYSTE | 113       | SHAKER               | 3,430.00         |
| WALLACE & TIERNAN    | FA145     | PRESS GAUGE          | 282.00           |
| FLUKE                | 77        | MULTIMETER           | 116.10           |
| CHADWICK HELMUTH     | 201R      | SWEEP SYNC.          | 345.00           |
| LECTROETCH           | VT-15A    | POWER UNIT           | 250.00           |
| LAMBDA               | LH124FM   | POWER SUPPLY         | 179.00           |
| CORNELL-DUBILIER     | BF60      | CAP BRIDGE           | 51.85            |
| B & K                | 4134      | MICROPHONE           | 900.00           |
| B & K                | 4134      | MICROPHONE           | 900.00           |
| IBM                  | 5371      | COMPUTER             |                  |
| L & N                | 4035B     | STD. RESISTOR        | 52.00            |
| WALLACE & TIERNAN    | FA233     | PRESS GAUGE          | 417.00           |
| HONEYWELL            | 1100      | STD. RESISTOR        | 225.00           |
| FLUKE                | -6502     | INTERFACE            | 1,090.00         |
| HEWLETT PACKARD      | 61021     | PWR SUPPLY           | 362.15           |
| HEWLETT PACKARD      | 59401A    | ANALYZER GPIB        | 3,700.00         |
| TRIPLETT             | 630       | VOM                  | 34.50            |
| DIGITAL EQUIPMENT CO | RK05-TA   | TAPE EXERCISER       | 1,870.00         |
| HEWLETT PACKARD      | 7470A     | GRAPH. PLOTTER       | 787.00           |
| SIMPSON              | 260       | VOM                  | 61.65            |
| FLUKE                | 8800A     | DIG MULTIMETER       | 952.99           |
| PCB                  | 482A      | POWER SUPPLY         | 90.00            |

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|----------------------|----------|----------------------|------------------|
|                      |          | POTENTIOMETER        | 11,750.00        |
| GUILDLINE            | 9930     | HEAT GUN             | 42.00            |
| VEECO                | QD12500  | RECORDER             | 1,155.00         |
| GENRAD               | 1521B    | VOLTMETER AC         | 1,600.00         |
| B & K INSTRUMENTS IN | 2426     | GENERATOR            | 618.00           |
| ONAN                 | 3DAU-1R  | MULTIMETER           | 140.00           |
| FLUKE                | 77       | HEAD PHONES          | 113.33           |
| PLANTRONICS          | HSB552-1 | SERVO AMP            | 1,915.87         |
| SPECTRAL DYNAMICS    | SD104A   | THERMO CALIBR.       | 2,538.00         |
| ECTRON               | 1100CP   | POWER SUPPLY         | 2,618.55         |
| HEWLETT PACKARD      | 6459A    | SIG. GENERATOR       | 3,416.81         |
| HEWLETT PACKARD      | 628A     | TEST CHAMBER         | 5,100.00         |
| TENNEY               | T-55     | TOOL CABINET         | 125.00           |
| WELCH                |          | FORMATTER            | 2,140.00         |
| TEKTRONIX            | DF2      | VOLT CALIBRA.        | 2,129.15         |
| FLUKE                | 343A     | SCOPE CART           | 125.00           |
| TEKTRONIX            | 200C     | STD. INDUCTOR        | 170.00           |
| GENRAD               | 1482-R   | MANOMETER            | 800.00           |
| NASA                 | OIL      | THICKNESS GAGE       | 125.00           |
| STARRETT             | 467      | HYGROTHERMOGRA       | 365.00           |
| WEATHERTRONICS       | 5021     | HYGROTHERMOGRA       | 365.00           |
| WEATHERTRONICS       | 5021     | STOR CABINET         | 150.00           |
| VIDMAR               | MA225    | POWER SUPPLY         | 160.00           |
| B & K INSTRUMENTS IN | 2804     | PRINTER              | 200.00           |
| EPSON                | P70RA    | DELAY TIME BASE      | 775.00           |
| TEKTRONIX            | 7B71     | FREQUENCY COUNTER    | 1,389.45         |
| HEWLETT-PACKARD      | 5316B    | AMPLIFIER, DUAL TRAC | 1,050.00         |
| TEKTRONIX            | 7A26     | VAC PUMP             | 158.00           |
| WELCH                |          | OSCILLOSCOPE         | 1,088.44         |
| TEKTRONIX            | T932     | STD INDUCTOR         | 150.00           |
| GENRAD               | 1482E    | MANOMETER            | 5,073.00         |
| RUSKA                | DDR6000  | AIR PISTON GA.       | 3,690.15         |
| RUSKA                | 2465     | OSCILLOSCOPE         | 3,325.00         |
| TEKTRONIX            | 7704A    | PLUG-IN DUAL TIME BA | 535.00           |
| TEKTRONIX            | 7A18     | PLUG-IN DUAL TIME BA | 850.00           |
| TEKTRONIX            | 7B53A    | OSCILLOSCOPE         | 2,462.40         |
| TEKTRONIX            | 335      | MULTIMETER           | 1,238.40         |
| FLUKE                | 8810A    | VOLTMETER RMS        | 562.70           |
| HEWLETT PACKARD      | 3400     | GENERATOR            | 5,295.00         |
| ARGO SYSTEMS         | AS210-3  | COMPARATOR           | 2,640.00         |
| ARGO SYSTEMS         | AS210-2  | VHF SIG GEN          | 1,366.81         |
| HEWLETT PACKARD      | 606A     | MICROPHONE           | 900.00           |
| B & K                | 4134     | HEAD PHONES          | 113.33           |
| PLANTRONICS          | HSB552-1 | ANALYZER             | 1,095.00         |
| SENCORE              | VA48     | MICROPHONE           | 210.00           |
| B & K INSTRUMENTS IN | 4134     | STD RESISTOR         | 650.00           |
| L & N                | 4214     | PREAMPLIFIER         | 600.00           |
| B & K                | 2639     | MULTIMETER           | 140.00           |
| FLUKE                | 23       | LOCKER               | 41.40            |
| GSE                  |          | CARTRIDGE TAPE DRIVE | 735.00           |
| ALLOY COMPUTER       | FT60     | X Y RECORDER         | 2,574.00         |
| HEWLETT PACKARD      | 7045A    | MICROPHONE           | 900.00           |
| B & K                | 4134     |                      |                  |

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|----------------------|------------|-----------------------|------------------|
| ULTIMATE COMPUTER SU | NONE       | MICROMANAGER WORKSTA  | 130.55           |
| CALI. INST.          | 751T       | POWER SOURCEAC        | 2,056.40         |
| AERO VAC             | 202        | VAC GAGE ANALY        | 3,655.00         |
| AIR PRODUCTS         | NONE C     | CYLINDER GAS          | 134.00           |
| HEWLETT PACKARD      | 2010E      | CABINET               | 300.00           |
| B & K INSTRUMENTS IN | 4134/S     | MICROPHONE            | 447.00           |
| B & K INSTRUMENTS IN | 4134S      | MICROPHONE            | 300.00           |
| HEWLETT PACKARD      | 400EL      | VOLTMETER AC          | 327.45           |
| NASA                 | NONE       | DIGITIZER CAL         | 300.00           |
| AMSLER               |            | INTEG CALIB.          | 362.50           |
| PLANTRONICS          | SUPRA      | HEADPHONES            | 100.00           |
| BROOKS               | 1052       | FLOW CALIB            | 150.00           |
| TRIPLETT             | 310        | VOM                   | 105.00           |
| WHITELEY             | 0600       | FLOW CONSOLE          | 74,500.00        |
| B & K INSTRUMENTS IN | 2426       | VOLTMETER AC          | 1,600.00         |
| RACAL DANA           | 9478       | STANDARD, FREQUENCY   | 1,872.00         |
| HONDA                | EX5500     | GASOLINE GENERATOR    | 2,293.00         |
| SIMPSON              | 260        | VOM                   | 50.00            |
| RUSKA                | 6211-806-7 | PRESSURE GAGE         | 3,900.00         |
| FLUKE                | 77         | DIGITAL MULTIMETER    | 138.00           |
| CORNELL-DUBILIER     | BF60       | CAP BRIDGE            | 51.85            |
| HEWLETT PACKARD      | 6450A      | POWER SUPPLY          | 1,610.00         |
| ULTIMATE COMPUTER SU | NONE       | MICROMANAGER WORKSTA  | 130.55           |
| WYSE                 | 900128-02  | KEYBOARD              | 117.00           |
| HEWLETT PACKARD      | 334A       | ANALYZER              | 1,467.18         |
| RUSKA                | 6000       | MANOMETER             | 5,775.00         |
| NEFF                 | 620600AE   | DATA ACQUISITION SYST | 20,488.00        |
| PAROSCIENTIFIC       | 2200-AS-00 | PRESSURE TRANSDUCER   | 2,460.00         |
| DATAMETRICS          | 1015S      | SIGNAL COND           | 757.95           |
| SIMPSON              | 260-6      | VOM                   | 60.28            |
| AMDEK                | 300A       | TERMINAL              | 139.00           |
| INTERNATIONAL BUSINE | 5160087    | COMPUTER              | 3,497.00         |
| HITACHI              | V209       | OSCILLOSCOPE          | 708.25           |
| GENRAD               | 1986       | CALIBRATOR, SOUND LE  | 945.25           |
| DATAMETRICS          | 1174       | PRESS SYS             | 1,553.25         |
| DATA PRECISION       | 245        | DIG MULTIMETER        | 286.15           |
| ESI                  | 230B       | BRIDGE                | 2,263.49         |
| FLUKE                | 343A       | VOLT CALIB            | 1,935.15         |
| NICOLET              | 3010       | CONVERTER             | 755.25           |
| GENRAD               | W5MT3A     | VARIAC                | 95.00            |
| DIGITEC              | 3110       | CURRENT SOURCE        | 1,256.15         |
| TEKTRONIX            | 191        | RF SIGNAL GEN         | 425.00           |
| FLUKE                | 853A       | VOLTMETER             | 240.00           |
| TEKTRONIX            | 7D01       | LOGIC ANALYZER        | 4,972.95         |
| CLAROSTAT            | 240C       | DECADERESISTOR        | 350.00           |
| DYNA TECH            | 116SRL     | WELDER T/C            | 795.00           |
| HEWLETT PACKARD      | 9866       | PRINTER               | 3,216.00         |
| B & K INSTRUMENTS IN | 2619       | PREAMPLIFIER          | 442.00           |
| KEYTRONIC            | E03435     | KEYBOARD              | 85.00            |
| TEKTRONIX            | 067-0587-0 | CALIBRATOR PLUG IN    | 3,830.00         |
| EG&G                 | 550-1      | PHOTOMETER            | 2,908.00         |
| TEKTRONIX            | 7B92A      | TIME BASE PLUG IN     | 3,676.00         |

G F E DATA BASE REPORT  
Full Listing

| Manufacturer<br>Name | Model   | Description    | Acquisition<br>Cost |
|----------------------|---------|----------------|---------------------|
| HEWLETT PACKARD      | 98034B  | INTERFACE      | 465.85              |
| HEWLETT PACKARD      | 478A    | THER MOUNT     | 155.00              |
| HEWLETT PACKARD      | 5312A   | INTERFACE      | 350.00              |
| NASA                 | 81      | HEATER CONTROL | 1,500.00            |
| KEITHLEY             | 260     | NANOVOLT STD.  | 498.82              |
| FLOW DYNE            | N160070 | SONIC NOZZLE   | 250.00              |

G F E DATA BASE REPORT  
Full Listing

PAGE: 59

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| Manufacturer<br>Name | Model   | Description    | Acquisition<br>Cost |
|----------------------|---------|----------------|---------------------|
| HEWLETT PACKARD      | 98034B  | INTERFACE      | 465.85              |
| HEWLETT PACKARD      | 478A    | THER MOUNT     | 155.00              |
| HEWLETT PACKARD      | 5312A   | INTERFACE      | 350.00              |
| NASA                 | 81      | HEATER CONTROL | 1,500.00            |
| KEITHLEY             | 260     | NANOVOLT STD.  | 498.82              |
| FLOW DYNE            | N160070 | SONIC NOZZLE   | 250.00              |



ATTACHMENT 5  
COST PROPOSAL FORMS A THROUGH C

**COST PROPOSAL SUMMARY**

Solicitation 1-39-1270.0267

Proposer \_\_\_\_\_

Initial Contract \_\_\_\_\_

Period -- From: Oct. 1, 1992 To: Sep. 30, 1993

|   | Hours        | Costs        |
|---|--------------|--------------|
| <b>DIRECT LEVEL OF EFFORT LABOR COSTS:</b>                        |              |              |
| Straight Time .....   | _____        | _____        |
| Overtime Excluding Premium .....                                  | _____        | _____        |
| Overtime Premium .....  | _____        | _____        |
| Shift Differential .....  | _____        | _____        |
| Subcontract Direct Level of Effort Labor .....                    | _____        | _____        |
| <b>TOTAL DIRECT LEVEL OF EFFORT LABOR COST .....</b>              | <b>_____</b> | <b>_____</b> |
| <b>DIRECT NON-LEVEL OF EFFORT LABOR COSTS:</b>                    |              |              |
| Straight Time .....   | _____        | _____        |
| Overtime Excluding Premium .....                                  | _____        | _____        |
| Overtime Premium .....  | _____        | _____        |
| <b>TOTAL DIRECT NON-LOE LABOR COST .....</b>                      | <b>_____</b> | <b>_____</b> |
| <b>FRINGES AND PAYROLL TAXES:</b>                                 |              |              |
| FICA .....  |              | _____        |
| FUI .....   |              | _____        |
| SUI .....   |              | _____        |
| Worker's Compensation .....                                       |              | _____        |
| General Liability Insurance .....                                 |              | _____        |
| Medical/Dental Insurance .....                                    |              | _____        |
| Life/Disability Insurance .....                                   |              | _____        |
| Paid Absence .....  |              | _____        |
| Other Fringe (Specify) .....                                      |              | _____        |
| Other Fringe (Specify) .....                                      |              | _____        |
| All Others Fringes (Itemize separately) .....                     |              | _____        |
| <b>TOTAL FRINGES AND PAYROLL TAXES .....</b>                      |              | <b>_____</b> |
| <b>OTHER:</b>   |              |              |
| Costs Other than Labor, and Profit, for Subcontracts in LOE ..... |              | _____        |
| Subcontracts Other than Level of Effort .....                     |              | _____        |
| Costs Subject to ODC Cost Limitation of B.3.B .....               |              | 1,010,000    |
| Buildings and Related Costs .....                                 |              | _____        |
| Capital Equipment Costs/Leased Equipment Costs .....              |              | _____        |
| Allocated Labor Other than G & A .....                            |              | _____        |
| City/County Business License Tax .....                            |              | _____        |
| Costs not shown Elsewhere (Provide Separate Detail) .....         |              | _____        |
| <b>TOTAL OTHER .....</b>  |              | <b>_____</b> |
| G & A .....   |              | _____        |
| FACILITIES CAPITAL COST OF MONEY .....                            |              | _____        |
| <b>TOTAL COST .....</b>   |              | <b>_____</b> |
| AWARD FEE .....   |              | _____        |
| <b>COST PLUS AWARD FEE .....</b>                                  |              | <b>_____</b> |

Solicitation 1-39-1270.0267  
Instrument Support Services

DIRECT LEVEL-OF-EFFORT LABOR COSTS

FORM B1

Proposer \_\_\_\_\_

Initial Contract Oct 1, 1992 Through Sep. 30, 1993

|  | Straight-<br>Time<br>Hours | Over-<br>Time<br>Hours | Straight-<br>Time<br>Rate | Straight-<br>Time<br>Costs | Overtime<br>Costs Excl.<br>Premium | Overtime<br>Premium<br>Costs | Total<br>Costs |
|--|----------------------------|------------------------|---------------------------|----------------------------|------------------------------------|------------------------------|----------------|
| Pressure/Flow Calibration Engineer         |                            |                        |                           |                            |                                    |                              |                |
| Metrology/Motion Calibration Engineer      |                            |                        |                           |                            |                                    |                              |                |
| Electric/Electronic/Temp. Calibr. Engineer |                            |                        |                           |                            |                                    |                              |                |
| Field Application Engineer                 |                            |                        |                           |                            |                                    |                              |                |
| Acoustical Systems Engineer                |                            |                        |                           |                            |                                    |                              |                |
| Digital Systems Maintenance Engineer       |                            |                        |                           |                            |                                    |                              |                |
| Instrument Calibration Aide                |                            |                        |                           |                            |                                    |                              |                |
| Calibration Engineering Technician         |                            |                        |                           |                            |                                    |                              |                |
| Electronic Technician                      |                            |                        |                           |                            |                                    |                              |                |
| Experimental Electronics Mechanic          |                            |                        |                           |                            |                                    |                              |                |
| Camera Repair Mechanic                     |                            |                        |                           |                            |                                    |                              |                |
| Engineering Technician                     |                            |                        |                           |                            |                                    |                              |                |
| Machinist                                  |                            |                        |                           |                            |                                    |                              |                |
| Digital Systems Hardware Engineer          |                            |                        |                           |                            |                                    |                              |                |
| Systems Analyst/Programmer                 |                            |                        |                           |                            |                                    |                              |                |
| Engineering Draftsman                      |                            |                        |                           |                            |                                    |                              |                |
| Instrument Control Clerk                   |                            |                        |                           |                            |                                    |                              |                |
| Production Control Supervisor              |                            |                        |                           |                            |                                    |                              |                |
| Shipping/Receiving Clerk                   |                            |                        |                           |                            |                                    |                              |                |
| Clerk-Typist                               |                            |                        |                           |                            |                                    |                              |                |
| Technical Editor                           |                            |                        |                           |                            |                                    |                              |                |
| Technical Typist                           |                            |                        |                           |                            |                                    |                              |                |
| Data Entry Clerk                           |                            |                        |                           |                            |                                    |                              |                |
| Equipment Handler/Driver                   |                            |                        |                           |                            |                                    |                              |                |
| Laser Optics Engineer                      |                            |                        |                           |                            |                                    |                              |                |
| Other (Specify)                            |                            |                        |                           |                            |                                    |                              |                |
| TOTAL DIRECT LOE HOURS/DOLLARS             |                            |                        |                           |                            |                                    |                              |                |

Solicitation 1-39-1270.0267  
 Proposer \_\_\_\_\_

OPTIONS TO INCREASE THE LEVEL OF EFFORT

|  | Initial<br>Contract<br>Period<br>10/1/92-<br>9/30/93 | 1st Ext.<br>Option<br>Period<br>10/1/93-<br>9/30/94 | 2nd Ext.<br>Option<br>Period<br>10/1/94-<br>9/30/95 | 3rd Ext.<br>Option<br>Period<br>10/1/95-<br>9/30/97 | 4th-9th Ext.<br>Option<br>Period<br>10/1/97-<br>3/31/98 | Total<br>All Periods<br>10/1/92-<br>3/31/98 |
|--|--|---|---|---|---|---|
| TOTAL LEVEL OF EFFORT LABOR HOURS .....                                  | 31,875   | 56,250  | 80,625  | 196,875   | 60,000  | 425,625                                     |
| DIRECT LEVEL OF EFFORT LABOR COSTS .....                                 |  |   |   |   |   |   |
| SUBCONTRACT LEVEL OF EFFORT LABOR COSTS .....                            |  |   |   |   |   |   |
| DIRECT NON-LEVEL OF EFFORT LABOR COSTS .....                             |  |   |   |   |   |   |
| FRINGES AND PAYROLL TAXES .....  |  |   |   |   |   |   |
| OTHER:   |  |   |   |   |   |   |
| Subcontracts Other than Level of Effort .....                            |  |   |   |   |   |   |
| Costs Other than Labor, and Profit, for Subcontracts in LOE .....        | XXXXXX   | XXXXXX  | XXXXXX  | XXXXXX  | XXXXXX  | XXXXXX                                      |
| Costs Subject to ODC Cost Limitation of B.3.B. . . . Estimate Separately |  |   |   |   |   |   |
| Buildings and Related Costs .....  |  |   |   |   |   |   |
| Capital Equipment Costs/Leased Equipment Costs .....                     |  |   |   |   |   |   |
| Allocated Labor Other than G & A .....                                   |  |   |   |   |   |   |
| City/County Business License Tax .....                                   |  |   |   |   |   |   |
| Costs not shown Elsewhere (Provide Separate Detail) .....                |  |   |   |   |   |   |
| TOTAL OTHER .....  |  |   |   |   |   |   |
| G & A .....  |  |   |   |   |   |   |
| FACILITIES CAPITAL COST OF MONEY .....                                   |  |   |   |   |   |   |
| TOTAL COST .....   |  |   |   |   |   |   |
| AWARD FEE .....  |  |   |   |   |   |   |
| COST PLUS AWARD FEE .....  |  |   |   |   |   |   |
| COST PER LOE HOUR .....  |  |   |   |   |   |   |
| AWARD FEE PER LOE HOUR .....   |  |   |   |   |   |   |

ATTACHMENT 6

CERTIFICATE OF CURRENT COST OR PRICING DATA, FORM PROC./P-281



ATTACHMENT 7

CONTRACT PRICING PROPOSAL COVER SHEET, STANDARD FORM 1411,  
JULY 1987 WITH INSTRUCTIONS

|  |  |  |                                 |
|--|--|--|---------------------------------|
| <b>CONTRACT PRICING PROPOSAL COVER SHEET</b>   |  | 1. SOLICITATION/CONTRACT/MODIFICATION NO.        | FORM APPROVED OMB NO. 9000-0013 |
| NOTE: This form is used in contract actions if submission of cost or pricing data is required. (See FAR 15.804-6(b))   |  |  |                                 |
| 2. NAME AND ADDRESS OF OFFEROR (Include ZIP Code)  |  | 3A. NAME AND TITLE OF OFFEROR'S POINT OF CONTACT | 3B. TELEPHONE NO.               |
| 4. TYPE OF CONTRACT ACTION (Check)   |  |  |                                 |
| <input type="checkbox"/> A. NEW CONTRACT   |  | <input type="checkbox"/> D. LETTER CONTRACT      |                                 |
| <input type="checkbox"/> B. CHANGE ORDER   |  | <input type="checkbox"/> E. UNPRICED ORDER       |                                 |
| <input type="checkbox"/> C. PRICE REVISION/REDETERMINATION   |  | <input type="checkbox"/> F. OTHER (Specify)      |                                 |
| 5. TYPE OF CONTRACT (Check)<br><input type="checkbox"/> FFP <input type="checkbox"/> CPFF <input type="checkbox"/> CPIF <input type="checkbox"/> CPAF<br><input type="checkbox"/> FPI <input type="checkbox"/> OTHER (Specify) |  | 6. PROPOSED COST (A+B=C)                         |                                 |
| A. COST  |  | B. PROFIT/FEE                                    | C. TOTAL                        |
| \$   |  | \$   | \$                              |
| 7. PLACE(S) AND PERIOD(S) OF PERFORMANCE   |  |  |                                 |

8. List and reference the identification, quantity and total price proposed for each contract line item. A line item cost breakdown supporting this recap is required unless otherwise specified by the Contracting Officer. (Continue on reverse, and then on plain paper, if necessary. Use same headings.)

| A. LINE ITEM | B. IDENTIFICATION | C. QUANTITY | D. TOTAL PRICE | E. REF. |
|--------------|-------------------|-------------|----------------|---------|
|              |                   |             |                |         |

9. PROVIDE NAME, ADDRESS, AND TELEPHONE NUMBER FOR THE FOLLOWING (If available)

|                                   |                 |
|-----------------------------------|-----------------|
| A. CONTRACT ADMINISTRATION OFFICE | B. AUDIT OFFICE |
|-----------------------------------|-----------------|

|   |  |  |
|---|--|--|
| 10. WILL YOU REQUIRE THE USE OF ANY GOVERNMENT PROPERTY IN THE PERFORMANCE OF THIS WORK? (If "Yes," identify)<br><br><input type="checkbox"/> YES <input type="checkbox"/> NO | 11A. DO YOU REQUIRE GOVERNMENT CONTRACT FINANCING TO PERFORM THIS PROPOSED CONTRACT? (If "Yes," complete Item 11B)<br><br><input type="checkbox"/> YES <input type="checkbox"/> NO | 11B. TYPE OF FINANCING (If one)<br><input type="checkbox"/> ADVANCE PAYMENTS <input type="checkbox"/> PROGRESS PAYMENTS<br><input type="checkbox"/> GUARANTEED LOANS |
|---|--|--|

|   |  |
|---|--|
| 12. HAVE YOU BEEN AWARDED ANY CONTRACTS OR SUBCONTRACTS FOR THE SAME OR SIMILAR ITEMS WITHIN THE PAST 3 YEARS? (If "Yes," identify item(s), customer(s) and contract number(s))<br><br><input type="checkbox"/> YES <input type="checkbox"/> NO | 13. IS THIS PROPOSAL CONSISTENT WITH YOUR ESTABLISHED ESTIMATING AND ACCOUNTING PRACTICES AND PROCEDURES AND FAR PART 31 COST PRINCIPLES? (If "No," explain)<br><br><input type="checkbox"/> YES <input type="checkbox"/> NO |
|---|--|

14. COST ACCOUNTING STANDARDS BOARD (CASB) DATA (Public Law 91-379 as amended and FAR PART 30)

|   |  |
|---|--|
| A. WILL THIS CONTRACT ACTION BE SUBJECT TO CASB REGULATIONS? (If "No," explain in proposal)<br><br><input type="checkbox"/> YES <input type="checkbox"/> NO   | B. HAVE YOU SUBMITTED A CASB DISCLOSURE STATEMENT (CASB DS-1 or 2)? (If "Yes," specify in proposal the office to which submitted and if determined to be adequate)<br><br><input type="checkbox"/> YES <input type="checkbox"/> NO |
| C. HAVE YOU BEEN NOTIFIED THAT YOU ARE OR MAY BE IN NON-COMPLIANCE WITH YOUR DISCLOSURE STATEMENT OR COST ACCOUNTING STANDARDS? (If "Yes," explain in proposal)<br><br><input type="checkbox"/> YES <input type="checkbox"/> NO | D. IS ANY ASPECT OF THIS PROPOSAL INCONSISTENT WITH YOUR DISCLOSED PRACTICES OR APPLICABLE COST ACCOUNTING STANDARDS? (If "Yes," explain in proposal)<br><br><input type="checkbox"/> YES <input type="checkbox"/> NO              |

This proposal is submitted in response to the RFP, contract, modification, etc. in Item 1 and reflects our best estimates and/or actual costs as of this date and conforms with the instructions in FAR 15.804-6(b) (2), Table 15-2. By submitting this proposal, the offeror, if selected for negotiation, grants the contracting officer or an authorized representative the right to examine, at any time before award, those books, records, documents and other types of factual information, regardless of form or whether such supporting information is specifically referenced or included in the proposal as the basis for pricing, that will permit an adequate evaluation of the proposed price.

|                           |                        |
|---------------------------|------------------------|
| 15. NAME AND TITLE (Type) | 16. NAME OF FIRM       |
| 17. SIGNATURE             | 18. DATE OF SUBMISSION |



## TABLE 15-2 INSTRUCTIONS FOR SUBMISSION OF A CONTRACT PRICING PROPOSAL\*

1. SF 1411 provides a vehicle for the offeror to submit to the Government a pricing proposal of estimated and/or incurred costs by contract line item with supporting information, adequately cross-referenced, suitable for detailed analysis. A cost-element breakdown, using the applicable format prescribed in 7A, B, or C below, shall be attached for each proposed line item and must reflect any specific requirements established by the contracting officer. Supporting breakdowns must be furnished for each cost element, consistent with offeror's cost accounting system. When more than one contract line item is proposed, summary total amounts covering all line items must be furnished for each cost element. If agreement has been reached with Government representatives on use of forward pricing rates/factors, identify the agreement, include a copy, and describe its nature. Depending on offeror's system, breakdowns shall be provided for the following basic elements of cost, as applicable:

**Materials**--Provide a consolidated priced summary of individual material quantities included in the various tasks, orders, or contract line items being proposed and the basis for pricing (vendor quotes, invoice prices, etc.). Include raw materials, parts, components, assemblies, and services to be produced or performed by others. For all items proposed, identify the item and show the source, quantity, and price.

**Competitive Methods**--For those acquisitions (e.g., subcontracts, purchase orders, material orders, etc.) over \$500,000 priced on a competitive basis, also provide data showing degree of competition, and the basis for establishing the source and reasonableness of price. For interorganizational transfers priced at other than cost of the comparable competitive commercial work of the division, subsidiary, or affiliate of the contractor, explain the pricing method (see 31.205-26(e)).

**Established Catalog or Market Prices/Prices Set by Law or Regulation**--When an exemption from the requirement to submit cost or pricing data is claimed, whether the item was produced by others or by the offeror, provide justification for the exemption as required by 15.804-3(e).

**Noncompetitive Methods**--For those acquisitions (e.g., subcontracts, purchase orders, material orders, etc.) over \$500,000 priced on a noncompetitive basis, also provide data showing the basis for establishing source and reasonableness of price. For standard commercial items fabricated by the offeror that are generally stocked in inventory, provide a separate cost breakdown if priced based on cost. For interorganizational transfers priced at cost, provide a separate breakdown of cost by elements. As required by 15.806-2(a), provide a copy of cost or pricing data submitted by the prospective source in support of each subcontract, or purchase order that is either (i) \$1,000,000 or more, or (ii) both more than \$500,000 and more than 10 percent of the prime contractor's proposed price. The contracting officer may require submission of cost or pricing data in support of proposals in lower amounts. Submit the results of the analysis of the prospective source's proposal as required by 15.806. When the submission of a prospective source's cost or pricing data is required as described above, it shall be included as part of the offeror's initial pricing proposal.

**Direct Labor**--Provide a time-phased (e.g., monthly, quarterly, etc.) breakdown of labor hours, rates, and cost by appropriate category, and furnish bases for estimates.

**Indirect Costs**--Indicate how offeror has computed and applied offeror's indirect costs, including cost breakdowns, and showing trends and budgetary data, to provide a basis for evaluating the reasonableness of proposed rates. Indicate the rates used and provide an appropriate explanation.

**Other Costs**--List all other costs not otherwise included in the categories described above (e.g., special tooling, travel, computer and consultant services, preservation, packaging and packing, spoilage and rework, and Federal excise tax on furnished articles) and provide bases for pricing.

**Royalties**--If more than \$250, provide the following information on a separate page for each separate royalty or license fee: name and address of licensor; date of license agreement; patent numbers, patent application serial numbers, or other basis on which the royalty is payable; brief description (including any part or model numbers of each contract item or component on which the royalty is payable); percentage or dollar rate of royalty per unit; unit price of contract item; number of units; and total dollar amount of royalties. In addition, if specifically requested by the contracting officer, provide a copy of the current license agreement and identification of applicable claims of specific patents. (See FAR 27.204 and 31.205-37).

**Facilities Capital Cost of Money**--When the offeror elects to claim facilities capital cost of money as an allowable cost, the offeror must submit Form CASB-CMB and show the calculation of the proposed amount (see FAR 31.205-10).

2. As part of the specific information required, the offeror must submit with offeror's proposal, and clearly identify as such, cost or pricing data (that is, data that are verifiable and factual and otherwise as defined at FAR 15.801). In addition, submit with offeror's proposal any information reasonably required to explain offeror's estimating process, including--

a. The judgmental factors applied and the mathematical or other methods used in the estimate, including those used in projecting from known data; and

b. The nature and amount of any contingencies included in the proposed price.

3. Whenever the offeror has incurred costs for work performed before submission of proposal, those costs must be identified in the offeror's cost/price proposal.

4. There is a clear distinction between submitting cost or pricing data and merely making available books, records, and other documents without identification. The requirement for submission of cost or pricing data is met when all accurate cost or pricing data reasonably available to the offeror have been submitted, either actually or by specific identification, to the contracting officer or an authorized representative. As later information comes into the offeror's possession, it should be promptly submitted to the contracting officer. The requirement for submission of cost or pricing data continues up to the time of final agreement on price.

5. In submitting offeror's proposal, offeror must include an index, appropriately referenced, of all the cost or pricing data and information accompanying or identified in the proposal. In addition, any future additions and/or revisions, up to the date of agreement on price, must be annotated on a supplemental index.

\*Federal Acquisition Regulation, paragraph 15.804-6(b).

6. By submitting offeror's proposal, the offeror, if selected for negotiation, grants the contracting officer or an authorized representative the right to examine, at any time before award, those books, records, documents, and other types of factual information, regardless of form or whether such supporting information is specifically referenced or included in the proposal as the basis for pricing, that will permit an adequate evaluation of the proposed price.

7. As soon as practicable after final agreement on price, but before the award resulting from the proposal, the offeror shall, under the conditions stated in FAR 15.804-4, submit a Certificate of Current Cost or Pricing Data.

8. HEADINGS FOR SUBMISSION OF LINE-ITEM SUMMARIES:

A. New Contracts (including Letter contracts).

| COST ELEMENTS | PROPOSED CONTRACT ESTIMATE-TOTAL COST | PROPOSED CONTRACT ESTIMATE-UNIT COST | REFERENCE |
|---------------|---------------------------------------|--------------------------------------|-----------|
| (1)           | (2)                                   | (3)                                  | (4)       |

Under Column (1)--Enter appropriate cost elements.

Under Column (2)--Enter those necessary and reasonable costs that in offeror's judgment will properly be incurred in efficient contract performance. When any of the costs in this column have already been incurred (e.g., under a letter contract or unpriced order), describe them on an attached supporting schedule. When preproduction or startup costs are significant, or when specifically requested to do so by the contracting officer, provide a full identification and explanation of them.

Under Column (3)--Optional, unless required by the contracting officer.

Under Column (4)--Identify the attachment in which the information supporting the specific cost element may be found. Attach separate pages as necessary.

B. Change Orders Modifications, and Claims.

| COST ELEMENTS | ESTIMATED COST OF ALL WORK DELETED | COST OF DELETED WORK ALREADY PERFORMED | NET COST TO BE DELETED | COST OF WORK ADDED | NET COST OF CHANGE | REFERENCE |
|---------------|------------------------------------|--|------------------------|--------------------|--------------------|-----------|
| (1)           | (2)                                | (3)                                    | (4)                    | (5)                | (6)                | (7)       |

Under Column (1)--Enter appropriate cost elements.

Under Column (2)--Include (i) current estimates of what the cost would have been to complete deleted work not yet performed, and (ii) the cost of deleted work already performed.

Under Column (3)--Include the incurred cost of deleted work already performed, actually computed if possible, or estimated in the contractor's accounting records. Attach a detailed inventory of work, materials, parts, components, and hardware already purchased, manufactured, or performed and deleted by the change, indicating the cost and proposed disposition of each line item. Also, if offeror desires to retain these items or any portion of them, indicate the amount offered for them.

Under Column (4)--Enter the net cost to be deleted which is the estimated cost of all deleted work less the cost of deleted work already performed. Column (2) less Column (3) = Column (4).

Under Column (5)--Enter the offeror's estimate for cost of work added by the change. When nonrecurring costs are significant, or when specifically requested to do so by the contracting officer, provide a full identification and explanation of them. When any of the costs in this column have already been incurred, describe them on an attached supporting schedule.

Under Column (6)--Enter the net cost of change which is the cost of work added, less the net cost to be deleted. When this result is negative, place the amount in parentheses. Column (4) less Column (5) = Column (6).

Under Column (7)--Identify the attachment in which the information supporting the specific cost element may be found. Attach separate pages as necessary.

C. Price Revision/Redetermination.

| CUTOFF DATE | NUMBER OF UNITS COMPLETED | NUMBER OF UNITS TO BE COMPLETED | CONTRACT AMOUNT | REDETERMINATION PROPOSAL AMOUNT | DIFFERENCE |
|-------------|---------------------------|---------------------------------|-----------------|---------------------------------|------------|
| (1)         | (2)                       | (3)                             | (4)             | (5)                             | (6)        |

| COST ELEMENTS | INCURRED COST- PREPRODUCTION | INCURRED COST- COMPLETED UNITS | INCURRED COST- WORK IN PROGRESS | TOTAL INCURRED COST | ESTIMATED COST TO COMPLETE | ESTIMATED TOTAL COST | REFERENCE |
|---------------|------------------------------|--------------------------------|---------------------------------|---------------------|----------------------------|----------------------|-----------|
| (7)           | (8)                          | (9)                            | (10)                            | (11)                | (12)                       | (13)                 | (14)      |

Under Column (1)--Enter the cutoff date required by the contract if applicable.

Under Column (2)--Enter the number of units completed during the period for which experienced costs of production are being submitted.

Under Column (3)--Enter the number of units remaining to be completed under the contract.

Under Column (4)--Enter the cumulative contract amount.

Under Column (5)--Enter the offeror's redetermination proposal amount.

Under Column (6)--Enter the difference between the contract amount and the redetermination proposal amount. When this result is negative, place the amount in parenthesis. Column (4) less Column (5) = Column (6).

Under Column (7)--Enter appropriate cost elements. When residual inventory exists, the final costs established under fixed-price-incentive and fixed-price-redeterminable arrangements should be net of the fair market value of such inventory. In support of subcontract costs, submit a listing of all subcontracts subject to repricing action, annotated as to their status.

Under Column (8)--Enter all costs incurred under the contract before starting production and other nonrecurring costs (usually referred to as startup costs) from offeror's books and records as of the cutoff date. These include such costs as preproduction engineering, special plant rearrangement, training program, and any identifiable nonrecurring costs such as initial rework, spoilage, pilot runs, etc. In the event the amounts are not segregated in or otherwise available from offeror's records, enter in this column offeror's best estimates. Explain the basis for each estimate and how the costs are charged on offeror's accounting records (e.g., included in production costs as direct engineering labor, charged to manufacturing overhead, etc.). Also show how the costs would be allocated to the units at their various stages of contract completion.

Under Columns (9) and (10)--Enter in Column (9) the production costs from offeror's books and records (exclusive of preproduction costs reported in Column (8)) of the units completed as of the cutoff date. Enter in Column (10) the costs of work in process as determined from offeror's records or inventories at the cutoff date. When the amounts for work in process are not available in contractor's records but reliable estimates for them can be made, enter the estimated amounts in Column (10) and enter in Column (9) the differences between the total incurred costs (exclusive of preproduction costs) as of the cutoff date and these estimates. Explain the basis for the estimates, including identification of any provision for experienced or anticipated allowances, such as shrinkage, rework, design changes, etc. Furnish experienced unit or lot costs (or labor hours) from inception of contract to the cutoff date, improvement curves, and any other available production cost history pertaining to the item(s) to which offeror's proposal relates.

Under Column (11)--Enter total incurred costs (Total of Column (8), (9), and (10)).

Under Column (12)--Enter those necessary and reasonable costs that in contractor's judgment will properly be incurred in completion of the remaining work to be performed under the contract with respect to the item(s) to which contractor's proposal relates.

Under Column (13)--Enter total estimated cost (Total of Column (11) and (12)).

Under Column (14)--Identify the attachment in which the information supporting the specific cost element may be found. Attach separate pages as necessary.

ATTACHMENT 8

QUARTERLY LISTING OF CONTRACTOR - ACQUIRED PROPERTY,  
AD FORM PROC. 300



ATTACHMENT 9

INDEX OF REFERENCE DOCUMENTATION CONTAINED IN BIDDER'S LIBRARY

**INDEX OF REFERENCE DOCUMENTATION  
CONTAINED IN BIDDER'S LIBRARY  
(4 LANGLEY BLVD., BLDG. 1230, ROOM 202)**

**Acquisition Regulations**

- NHB 5103.6                      Source Evaluation Board Handbook (Includes Streamlined Acquisition Handbook)
- NHB 9501.2                      Procedures for Contractor Reporting of Correlated Costs and Cost Performance Data (533M's and 533Q's)

**Safety Regulations**

- LHB 1710.10                      LaRC Red Tag System
- LHB 1710.12                      Potentially Hazardous Materials

**Other Reference Documents**

- LHB 5300.1                      Program Assurance Manual
- LMI 5300.1                      Systems Safety, Quality, Reliability Program
- NHB 5300.4(1C)                      Reliability and Quality Assurance Publication (Inspection Systems Provisions for Aeronautical and Space Systems Materials, Components, and Services)
- ISA                                  Standards and Practices for Instrumentation
- NAVY                                Metrology Requirements List (METRL)
- NHB 5300.4(3A-1)                      Requirements for Soldered Electrical Connections
- NASA Software Documentation Standards
- Listing of Government-Furnished Materials
- ADP Equipment Listing

General Instrumentation Equipment Listing:

- Loan Pool Equipment Listing
- Loan Pool Catalog

Decontrolled Equipment > \$500 < \$1000

Work Orders Issued (for the period March 16 through April 16, 1992)

LaRC Stores Stock Catalog



ATTACHMENT 10

INSTRUMENT RESEARCH DIVISION INSTRUCTION 91-1  
(PROCEDURES FOR RECEIPT AND INSPECTION FUNCTIONS  
AT CONTRACTOR-OPERATED FACILITY)

**INSTRUMENT RESEARCH DIVISION INSTRUCTION 91-1****Receipt and Inspection Functions at Contractor-Operated Facilities (Replaces LPN 84-6)**

**PURPOSE:** This instruction outlines the procedures to facilitate the receipt and inspection of Langley Research Center (LaRC) purchased instruments at Contractor Inspection Facilities.

**I. SCOPE**

This document applies to contractor-operated facilities regarding Receipt and Inspection procedures for **instruments and related components** procured by LaRC contracts and purchase orders which specify delivery to a contractor's facility. **Receipt and Inspection functions at contractor facilities will be limited to materials and equipment which the contractor has the technical capability to properly receive and/or inspect.**

The contractor has authority to ship only items which have properly completed and approved work order and shipping memorandums (LF 165). The contractor is not to be used as an alternate shipping agent for the Government circumventing Transportation and Warehousing Section (TWS) responsibilities.

**II. TECHNICAL MONITORSHIP, ASSISTANCE, AND CONTROL**

- A. The NASA Technical Representative of the Contracting Officer (TRCO) will assign a monitor to the contractor's receiving and inspection activities. This monitor will maintain the same technical relationship as if the instruments were received under normal LaRC procedures. The monitor will sign all Receipt and Inspection Reports, after preparation by the contractor, which will constitute **receipt** by the Government. The monitor may obtain advice and assistance, as required, from (1) the Contract Specialist assigned the responsibility for administering the contract, (2) the Property Officer, (3) the Instrument Control Unit (ICU), (4) the Logistics Management Branch (LMB), and the (5) Acquisition Division.
- B. The Instrument Control Unit (ICU) will determine when contractor inspection capabilities will be used. All purchase requests for instruments (and related components) will be routed by Logistics Management Branch (LMB) through the ICU. When it is determined by the technical monitor that a contractor will perform receipt and inspection functions, the

inspection contractor's "Ship To:" block will be checked on the Purchase Request (LF 125, Exhibit "A"). If receipt and inspection is to be accomplished at LaRC by the usual procedures, the "Ship To: NASA, LaRC" block will be checked. In cases where the correct destination **has not** been shown on the Procurement Document and delivery has been made to LaRC, the action to be taken is explained in detail in Part IV.J.

- C. All solicitations, orders, and contracts, based on Purchase Requests which have been marked for contractor receipt and inspection will contain the following provision advising the supplier furnishing the item(s) that a contractor will act for the Government in receipt and inspection of the item(s):

"Receiving and inspection of the materials will be performed by (contractor's name) acting for the Government. Mark all deliveries with Government Contract/Order Number."

### III. GENERAL OUTLINE OF CONTRACTOR'S DUTIES

The Contractor-operated receipt and inspection point will perform the following. (See Part IV for detailed outlines.) All orders will be processed through Shipping and Receiving and delivered to the appropriate lab on a same-day-next-day schedule (24 hours). Lab personnel will be utilized to minimize backlogs and maintain schedules.

- A. Receive and inspect (including required acceptance testing) instrument and related components which have been specified for delivery to his facility.
- B. Accept deliveries which meet contract/order specifications. Prepare and distribute Receipt and Inspection Report (R&I LaRC Form 131) (Exhibit "B"), or changes thereto, and Receipt and Inspection Report Cancellation or Correction, LF 32 (Exhibit "C") if required. (Ref. IV.B, for Preparation and IV.C, for distribution.)
- C. Complete applicable portion of Work Order and Shipping Memorandum, LF 165 (Exhibit "D") which identifies the incoming shipment and all contents. The monitor shall complete the LF 165 (Exhibit "D") and indicate which contractor group will perform the acceptance tests and assign job priority (Ref. IV.H).
- D. Reject all deliveries, when items do not conform to contract/order specifications. This includes incomplete orders (partial shipments). (Ref. IV.F)

- E. Attach the assigned Equipment Control Number (ECN) tag to inventoriable equipment (Ref. IV.E). When instruments require special handling, contact TWS.
- F. Deliver all instruments, after acceptance, to the ICU with the required paperwork (Ref. IV.I).
- G. File required forms in the contract/order file.
- H. Ship items directly to user's (with concurrence of the monitor).

#### IV. DETAILED PROCEDURES

##### A. DOCUMENTATION

1. The R&I is used to report the receipt of supplies or services, record property accountability, and provide a basis for payment of supplies and services procured under NASA contract/order.
2. The Rejection Report, LF 50 (Exhibit "E"), is a multipurpose form used to report contract/order discrepancies noted before the preparation of the R&I. Note: Purchase request forms (Rev. Oct, 1989) unless noted by Acquisition Division, do not permit partial shipments and will be rejected and returned to the vendor. (LF 125, Exhibit "A," Vendor's Copy.)
3. The Receipt and Inspection Report Cancellation and Correction, LF 32 (Exhibit "C"), commonly referred to as an "AN," is used for making changes to an R&I, which has been forwarded to PMB.
4. Work Order and Shipping Memorandum, LF 165 (Exhibit "D"), identifies the incoming instrument(s) and accessories which require testing.
5. Instrument/Controlled Property Delivery Ticket, LaRC Form 162 (Exhibit "F"), prepared by the contractor, serves as a Delivery Receipt to the ICU when the instrument is delivered to the user.
6. Delay Payment Memorandum, IRD 90 (Exhibit "J") prepared by the contractor, identifies item(s) which require withholding payment. This memorandum will be forwarded to NASA's Financial Management Division for any order not complete within 10 days of receipt. (Ref. IV.3.C)

B. RECEIPT AND INSPECTION (LF 131)

An R&I will be prepared upon receipt of property and retained, along with contract file, at the receiving point until the equipment has been accepted. The R&I and contract folder will then be routed as per IV.C. The R&I must contain, as a **minimum**, the following information.

1. Contract/order number
2. Date received
3. Date prepared
4. Government Bill of Lading (GBL) Number, when the order specifies FOB Shipping Point, if available
5. Job order number
6. Mode of transportation (plus weight and charges if available)
7. Discount, if applicable
8. Contract/order item number
9. Item nomenclature
10. Quantity received of each item
11. Unit/total cost for each item (recognizing acceptance and/or modification price)
12. Object class
13. Item(s) due (back ordered) for partial shipment.

C. LANGLEY RECEIPT AND INSPECTION FORM 131 DISTRIBUTION

1. The FMD (Copy 1) and procurement (Copy 2) together with all copies of packing lists, invoices, freight bill, etc., will be forwarded to LMB, MSD for review and distribution.
2. The Originator Copy is forwarded to the LaRC user after the item(s) has passed acceptance tests.
3. If shipments are received without necessary documentation or the documentation (packing lists, etc.) shows items which have not been received, the contractor shall contact the supplier by phone and submit cancellation or correction LF 32 as per paragraph F.3.b. If the supplier does not respond

satisfactorily with 10 workdays, the contractor will contact the contract specialist for assistance. If there are questions concerning the shipment, such as model number, type of cable, options, etc., the contractor will contact the supplier by phone for clarification.

#### D. RECEIPT ACKNOWLEDGEMENT

1. The shipping/receiving contract monitor or alternate will sign all R&Is after preparation by the contractor. This will constitute receipt by the Government.
2. The IRD Division Chief shall designate, in writing, those employees authorized to sign related documents for LaRC. Copies of the designation will be forwarded to the Contract Specialist assigned to the Contract and the Accounting Branch, FMD.

#### E. CONTROLLED PROPERTY

Controlled property is in Object Class 3101 through 3120 and will be identified with the Government Equipment Control Number (ECN) which has been assigned. The ECN tag will be affixed to the equipment in the front upper left-hand corner with the edge of the tag parallel to the edges of the item (if practical) or horizontal for equipment not having straight edges. **ECN tags shall not be affixed to removable doors or frames.** Each ECN tag supplied to the contractor will be accounted for. Therefore, when a NASA controlled item of equipment is discontinued for any reason (i.e., substitute item returned, unit exchange, etc.) an effort will be made to recover the equipment control number tag(s). In addition to the information required on the top of the R&I, the Federal Stock Code, ECN, Serial Number, Custodian, Custodian Code, Unit Cost, Total Cost, and Object Class Code will be reported when a new class of equipment is received.

When items are received which are to be added to an existing piece of equipment, the Purchase Request will be coded in the normal manner in the Inventory Specification Number block. In addition to the Federal Stock Code, the Logistics Management Branch (LMB) will enter (in red) "DO NOT INVENTORY." The contractor will not affix an ECN tag but will forward the R&I to LMB in the same manner as for controlled property. He will also show the ECN on the R&I that is indicated on the bottom of the Purchase Request.

## F. DISCREPANCIES

1. Unauthorized partial shipments will be processed as defined in paragraph 1.G. If other order discrepancies are found prior to preparation of the R&I, (i.e., shipping damages) a Rejection Report (LF 50, Exhibit "E") shall be prepared with the following information.
  - a. Order or contract number
  - b. R&I Data Received and Order number, identifying any acceptable portion of shipment, if applicable
  - c. Shipper's number (waybill number)
  - d. Appropriate information on discrepancy
  - e. Appropriate information under the headings "TO SHIPPING" and "TO CONSIGNEE" concerning action to be taken (with concurrence of the monitor).
  - f. Date forwarded
  - g. Partial shipments received without authorization that permits partial delivery will be rejected (in concurrence with the Shipping/Receiving contract monitor). The contractor shall contact the supplier, by phone, within three workdays of rejection to ascertain method of shipment and any required authorization(s). If the supplier cannot furnish necessary return authorization at that time, they will be informed that if authorization is not received within five workdays, the item will be returned the best way to original shipping point. All items returned shall be accompanied by a rejection memo (Exhibit "K") and a procurement notice P-17 (show cause for delinquent delivery, Exhibit "L") will be initiated and forward to the cognizant contracting officer once the PR/PO delivery date expires. Item(s) will be shipped within five workdays of contact.
2. The contractor shall distribute the Rejection Report (Exhibit "E") or the rejection memo (Exhibit "K") as follows:
  - a. Original and two copies to Contract Files. If rejected material is picked up at contractor's facility by company truck, the driver will be

required to acknowledge receipt of material by signing a copy for the contract file.

- b. A copy filed in the contract file. If a copy of the carrier's receipt is not immediately available, the contractor will note action taken.
  - c. One copy to the Accounting Branch.
  - d. One copy in the contractor's file.
3. Action required subsequent to preparation and distribution of the R&I.
- a. If the property received is visually acceptable, an R&I is completed. If during acceptance testing of the item(s) it does not meet specifications, the Inspection Lab will note deficiencies on the LF 165 and notify its receiving function. The blue and pink copies of the R&I will be marked "VOID" and placed in the contract file. Contract files received at the contractor facility fall into two categories; Large Order Contracts i.e. NAS1-xxxx and Small Purchase Orders (PR/PO) i.e. L-xxxxx. The processing procedure for discrepancies will be as follows:
    - (1) Small Purchase Orders (PR/PO) L-xxxxx  
The contractor will contact the supplier, by phone, within **three workdays** of rejection to ascertain if the item is to be returned or problem corrected on site. The Contract Specialist will not normally handle shipments of this type. If item is to be returned, method of shipment and any required authorization(s) will be determined during this contact. (In cases where contractor has previously been given blanket return authorization by a supplier, this step will be omitted and item will be shipped within three workdays of rejection.) If supplier cannot furnish necessary return authorization at this time, they will be informed that if authorization is not received within five workdays, the item will be returned best way to original shipping point. All items returned shall be accompanied by rejection memo (Exhibit "H") and a procurement notice P-17 (show cause for delinquent delivery, Exhibit "L") will be initiated and forwarded to the cognizant contracting officer once



the PR/PO delivery date expires. Item will be shipped within five workdays of contact.

(2) Large Order Contracts NAS1-xxxxx  
When informal, unofficial discussion to resolve discrepancies are complete the contractor will generate a contact report (Exhibit "I"). All items which fail acceptance will be documented as to their discrepancies on a contact report and forwarded to the shipping/receiving contract monitor, contract specialist, and included in the contract folder. A Government contract specialist will contact the supplier for all official negotiation. It is the Contract Specialist's responsibility to provide documentation, authorization, and/or instructions to the shipping/receiving contract monitor before contract processing can be completed. In unique situations these requirements may be waived, but only with concurrence of the shipping/receiving contract monitor.

- b. The contractor shall prepare the Receipt and Inspection Report cancellation and Correction Form (LF 32), to make changes and corrections to the R&I (LF 131). The contractor will note all deficiencies on the LF 165 work order and shipping memorandum. The LF 32 is prepared in duplicate and identifies the R&I being corrected. The original is routed to the Accounting Branch through LMB. The preparer files the copy on top of the R&I to which it pertains. An LF 32 (AN) is not prepared on shipments returned under warranty when the supplier has been paid.
- c. In circumstances which delay the acceptance testing beyond the original requested completion date, (in concurrence with technical monitor) the Inspection Lab will initiate a delay payment memorandum (Exhibit "J") and forward to cognizant technical monitor.

#### 4. DAMAGED SHIPMENTS

- a. If the container indicates that the shipment may have been damaged or subjected to harsh treatment, the Freight Bill or Carrier's Receipt shall be annotated describing the condition, and the carrier's representative will be requested to collaborate the condition by signature on documentation.

- b. If the damage appears to be substantial, the shipment will be refused or a request made for an inspection by the carrier's representative. In the latter case, a joint inspection will be performed as the shipment is being unpacked. The supplier is responsible for correction of errors in shipment and damage settlements with the carrier for all procurements with "FOB destination" terms. The contractor will advise the supplier of the damage and arrange corrective action with the concurrence of the shipping/receiving contract monitor.
- c. An LF 50 shall be prepared and copies provided for the contract/order file, and Accounting Branch. The Acquisition Division shall be furnished an action taken copy upon disposition, if other than an R&I.

#### G. TRANSPORTATION CHARGES

1. The Contractor may pay transportation charges under a contractual arrangement provided that:
    - a. The transportation cost does not exceed \$200 for any one shipment, and the contract manager (or designated alternate) approves the payment. A notation of such approval shall be made on the commercial bill or the R&I report.
    - b. If transportation charges exceed \$200 the contractor shall contact the LMB, MSD, for a GBL.
  2. If the carrier will not accept a GBL, the shipping charges will be paid by Contractor and an appropriate entry made on the R&I.
  3. If the carrier refuses to collect from the supplier, or otherwise demands payment, the shipping charges will be paid by the contractor. Appropriate entries shall be made on the R&I and distribution of the R&I will be made in the prescribed manner (refer to section).
- H. The contractor will complete a Work Order and Shipping memorandum (LF 165) which identifies the incoming shipment and indicates the group which will perform the acceptance test. The "Contractor" copy will be retained for the contractor's records and the R&I filed, which will be forwarded after the instrument has completed acceptance. All other copies will be forwarded to the ICU with the instrument.

- I. After satisfactory inspection, all items will be delivered by the contractor to the ICU, Building 1230, where delivery will be acknowledged on the "Contractor's Copy" of the Work Order and Shipping Memorandum Form. An LF 162 (Exhibit "F") will be completed as per procedures prescribed by LaRC.
- J. In cases where the correct destination (contractor) **has not** been shown on the procurement document and delivery has been made to the Langley Research Center, Building 1206, the Logistics Management Branch will forward the material received (except in the case of on-site delivery as stated in the contract), along with contract folder, to the inspecting contractor advising the Acquisition Operations Branch concurrently that the folder should be charged to the inspection contractor. Modifications to orders or contracts will not be required in the above cases. Other circumstances which may occur will be handled accordingly:
1. If an item is picked up at the company by an employee. The R&I will be written and tagged by LMB.
  2. If an item is delivered directly to the user and it is a contractor designated order, then the contractor will process and tag the equipment.
  3. If TWS, Building 1206, releases equipment before receiving the order/contract from contract files, and it is a contractor order, it becomes their responsibility to process the R&I and tag. If the user requires acceptance testing by the contractor, a Work Order (LF 165) will be submitted by the user.
  4. There will be a few exceptions which will require a determination on a case-by-case basis. These situations will be resolved between the shipping/receiving contract monitor and LMB responsible person.
- K. The contractor is responsible for the pick-up and/or return of all contract/order folders from the Acquisition Division file room. The contractor is responsible for the security of all contract files while in the contractor's possession. Files will be protected and stored in such a manner as to prevent loss, damage, or **unauthorized disclosure**. **Official contract files will remain in the inspecting contractor's custody for the minimum time consistent with need.**

- L. The contractor shall designate in writing those persons authorized to have access to the contract files. Copies of the designation will be forwarded to the Contract Specialist assigned to the contract, the Accounting Branch, FMD, and the Acquisition Division. This designation shall be kept current.
- M. The contractor shall maintain a daily log of inbound shipments. These forms will be forwarded to LMB in a timely manner. When Government-owned instruments are returned to the supplier for repair or replacement under warranty provisions, the contractor will be responsible for contacting the supplier to determine method of shipment, preparation of the shipping request (the shipping request (IRD N-62, Exhibit "G") will be approved by the shipping/receiving contract monitor and copies forwarded to FMD, MSD, and enclosed with the contract file to AD), and forwarding the instrument to the supplier. Redelivery of the repaired/replaced government property will be specified for "Ship to Inspection Contractor," as in part II.B. When Government purchase orders are required for nonwarranty instrument services, the contractor will work with the assigned procurement agent to obtain the contract file and purchase authorization information necessary to complete the process as defined above for repairs or replacements of Government-owned instruments.



NASA Langley Research Center  
PURCHASE ORDER (PO)

1. PAGE  
OF

|                            |  |                  |   |                  |  |
|----------------------------|--|------------------|---|------------------|--|
| SHIP TO:                   | <input type="checkbox"/> NASA Langley Research Center<br>TWS, BLDG. 1208<br>Hampton, VA 23065-5225 | MAIL INVOICE TO: | NASA Langley Research Center<br>M/S 175/Comm. Acctg. Section<br>Order No. L<br>Hampton, VA 23065-5225 | DATE OF ORDER    | ORDER NUMBER<br>L  |
|                            | <input type="checkbox"/> Wyle Laboratories<br>3200 Magruder Blvd.<br>Hampton, VA 23066             |                  | MARK FOR:<br>Order L  | DELIVERY REQD BY | ↑<br>This Purchase Order No. must appear on all invoices, packages, and papers relating to credit. Failure to cite no. may result in rejection of shipment and will delay payment. |
| S<br>E<br>L<br>E<br>C<br>T | FOB POINT  |                  | DISCOUNT TERMS  |                  |  |
|                            | SHIP VIA   |                  |   |                  |  |

| PO ITEM | 7. ARTICLES OR SERVICES<br>(Show name of item, description, and specifications.) | E. QTY | E. UNIT | UNIT PRICE | AMOUNT |
|---------|--|--------|---------|------------|--------|
|         |  |        |         |            |        |
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(Continue on NASA Langley Form 125 or plain bond paper.)

|               |                                   |   |       |  |
|---------------|-----------------------------------|---|-------|--|
| TYPE OF ORDER | <input type="checkbox"/> DELIVERY | This delivery order is subject to instructions herein and to the terms and conditions of Contract No. | TOTAL |  |
|               | <input type="checkbox"/> PURCHASE | Reference your _____ on the terms specified on the attached sheets, including delivery as indicated.  |       |  |

|   |                                 |
|---|---------------------------------|
| Certified for national defense under 90SA Reg. 2 and/or DMS Reg. 1 RATING DO- | UNITED STATES OF AMERICA        |
|   | BY _____<br>Contracting Officer |

**SALES TAXES** → **DO NOT BILL SALES TAX**  
NASA is a Federal Government Agency and is not subject to sales taxes.  
TAX EXEMPTION NO. 54-1344524

**ACCEPTANCE**

THE CONTRACTOR HEREBY ACCEPTS THE OFFER REPRESENTED BY THE NUMBERED PURCHASE ORDER, SUBJECT TO ALL OF THE TERMS AND CONDITIONS SET FORTH, AND AGREES TO PERFORM THE SAME. ANY EXCEPTION(S) TAKEN WILL CANCEL THIS OFFER UNLESS CONFIRMED IN WRITING BY THE CONTRACTING OFFICER DESIGNATED ABOVE. UNLESS PROVIDED FOR HEREIN, NO PARTIAL SHIPMENTS WILL BE ACCEPTED, AND NO PARTIAL PAYMENTS WILL BE MADE.

RETURN ONE COPY TO: NASA Langley Research Center, M/S 138/Contracting Officer, Hampton, VA 23065-5225

|                                    |                        |
|------------------------------------|------------------------|
| CONTRACTOR'S NAME (Print or Type)  | CONTRACTOR'S SIGNATURE |
| CONTRACTOR'S TITLE (Print or Type) | DATE SIGNED            |

RECEIPT AND INSPECTION REPORT (R & I)  
NONSTOCKED ITEMS

PAGE \_\_\_\_\_ OF \_\_\_\_\_

|                  |         |       |          |                      |  |  |
|------------------|---------|-------|----------|----------------------|--|--|
| F<br>I<br>R<br>M | FROM    |       |          | ORDER/CONTRACT NO.   |  |  |
|                  | ADDRESS |       |          | PURCHASE REQUEST NO. |  |  |
|                  | CITY    | STATE | ZIP CODE |                      |  |  |

| PO<br>ITEM | ARTICLES OR SERVICES | QTY<br>OR'D | UNIT | UNIT<br>PRICE | AMOUNT | QTY<br>REC'D |
|------------|----------------------|-------------|------|---------------|--------|--------------|
|            |                      |             |      |               |        |              |
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|           |                     |
|-----------|---------------------|
| ITEMS DUE | DELIVERY TICKET NO. |
|-----------|---------------------|

|   |        |
|---|--------|
| VIA   | WEIGHT |
| <input type="checkbox"/> TRUCK<br><input type="checkbox"/> PARCEL POST<br><input type="checkbox"/> UNITED PARCEL SERVICE<br><input type="checkbox"/> PAID<br><input type="checkbox"/> COLLECT<br><input type="checkbox"/> AIR<br><input type="checkbox"/> CONTRACTOR<br><input type="checkbox"/> NASA TRUCK<br><input type="checkbox"/> OTHER _____ |        |

| TRANS. COST/DATE APPROVED | GBL NO.       | LINE | OBJECT CLASS | JOB ORDER | AMOUNT |
|---------------------------|---------------|------|--------------|-----------|--------|
| RECEIVED BY               | DATE RECEIVED |      |              |           |        |

CERTIFICATION OF RECEIPT: I Certify that the supplies/services listed in the "Quantity Received" column were received.

SIGNATURE OF AUTHORIZED GOVERNMENT REPRESENTATIVE \_\_\_\_\_ DATE \_\_\_\_\_

INSPECTED BY \_\_\_\_\_ DATE INSPECTED \_\_\_\_\_ ACCEPTED BY \_\_\_\_\_ DATE ACCEPTED \_\_\_\_\_

REQUESTED BY \_\_\_\_\_ MAIL STOP \_\_\_\_\_ EXTENSION \_\_\_\_\_ FEDERAL SUPPLY CLASS \_\_\_\_\_

DELIVER TO (Consignee) \_\_\_\_\_ MAIL STOP \_\_\_\_\_ BLDG. \_\_\_\_\_ ROOM \_\_\_\_\_ EXTENSION \_\_\_\_\_ INV. PROP.  CUST. CODE \_\_\_\_\_

IMPORTANT NOTICE - INSPECT PROMPTLY

DELAY IN SUBMITTING THE R&I COULD RESULT IN THE PAYMENT OF INTEREST PENALTIES. SEE THE PROMPT PAYMENT ACT (PUBLIC LAW 91-177) If any of the items on this report are unsatisfactory, state the reason and return this report within five (5) working days to the Commercial Accounting Section, M.S. 175; unless otherwise stated in the contract. Return rejected instrumentation items to the Instrument Control Unit, ICD, B-1230, Room 140, M.S. 233, with a completed Form 100; and return all other rejected items with a copy of the R & I to Shipping, B-1206, M.S. 373. Note on the delivery ticket, your name, the item number from the receiving copy, and the purchase order or control number.

|                      |           |      |
|----------------------|-----------|------|
| UNSATISFACTORY ITEMS | SIGNATURE | DATE |
|----------------------|-----------|------|

RECEIPT AND INSPECTION REPORT  
CANCELLATION OR CORRECTION

|    |   |  |          |      |
|----|---|--|----------|------|
| TO | 1 | 377/EQUIPMENT MANAGEMENT SECTION, LMB, MSD | Initials | Date |
|    | 2 | 175/COMMERCIAL ACCOUNTING SECTION, AB, FMD | Initials | Date |

Type \_\_\_\_\_

SECTION I — INCREASE

| Job Order No. |     | Program/Project No. | P.C. No. | Funding (PYFSMA) | Order No. |            |              |
|---------------|-----|---------------------|----------|------------------|-----------|------------|--------------|
| Item No.      | ECN | Description         |          |                  | Qty.      | Total Cost | Object Class |
|               |     |                     |          |                  |           |            |              |
|               |     |                     |          |                  |           |            |              |
|               |     |                     |          |                  |           |            |              |
|               |     |                     |          |                  |           |            |              |
|               |     |                     |          |                  |           |            |              |
|               |     |                     |          |                  |           |            |              |
|               |     |                     |          |                  |           |            |              |

SECTION II — DECREASE

| Job Order No. |     | Program/Project No. | P.C. No. | Funding (PYFSMA) | Order No. |            |              |
|---------------|-----|---------------------|----------|------------------|-----------|------------|--------------|
| Item No.      | ECN | Description         |          |                  | Qty.      | Total Cost | Object Class |
|               |     |                     |          |                  |           |            |              |
|               |     |                     |          |                  |           |            |              |
|               |     |                     |          |                  |           |            |              |
|               |     |                     |          |                  |           |            |              |
|               |     |                     |          |                  |           |            |              |
|               |     |                     |          |                  |           |            |              |
|               |     |                     |          |                  |           |            |              |
|               |     |                     |          |                  |           |            |              |

Reference Receipt No. \_\_\_\_\_

Remarks \_\_\_\_\_

Signature \_\_\_\_\_ Section \_\_\_\_\_ Date \_\_\_\_\_



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
Langley Research Center, Hampton, VA 23665-5225  
**WORK ORDER AND SHIPPING MEMORANDUM**

WORK ORDER NO.

228120

**REQUESTER:** Fill in all information down to heavy black line and retain USER copy. Furnish service manuals with instrument. You may call ext. 44845 for information regarding status of this instrument. The Equipment Control No. (ECN), Metrology Control No. (MCN), or Serial No. must be given to check status. Send Work Order and instrument to Mail Stop 233/Instrument Control Office, Building 1230, Room 139.

**NOTE:** Work Order not properly completed will result in Work Order and instrument being returned to user unprocessed. Like Instruments may be entered on supplemental sheet (see last sheet in this set).

**THIS FORM WILL BE MICROFILMED - ONLY USE BLACK BALL POINT PEN AND PRESS FIRMLY.**

To Be Completed By User

| INSTRUMENT | MANUFACTURER | MODEL | SERIAL NO. | ECN / MCN |
|------------|--------------|-------|------------|-----------|
|            |              |       |            |           |

**ACCESSORIES:**  Power Cord  Cables  Probes  Manual  Cover/Case  AC Adapter  Batteries  
 Disks  Toner/Ribbon  Mouse  Software  Accessory Kit  Interface  Test Leads  Other (specify)

| USER'S PAYROLL NAME | BUILDING | ROOM | EXTENSION |
|---------------------|----------|------|-----------|
|                     |          |      |           |

| MAIL STOP | JOB ORDER NO. | DATE SENT | DATE REQUIRED (Do not use ASAP) |
|-----------|---------------|-----------|---------------------------------|
|           |               |           |                                 |

**CHECK SERVICE REQUIRED:**  Acceptance Test (A)  Calibration (C)  Functional Check (F)  Preventive Maintenance (G)  
 Warranty Repair (K)  Modify (H)  Repair (I)  Other (J) \_\_\_\_\_

REMARKS: (Symptoms, specifics, etc.)

Instrument Support Section - Technical Personnel Use Only

| DATE REQ. | ACTION REQ. | PERF. ORG. | MEAS. DISC. | JOB ORDER | INITIATE DATE | T.M. APPROVAL |
|-----------|-------------|------------|-------------|-----------|---------------|---------------|
|           |             |            |             |           |               |               |

| RECALL ID. | CAL INT. | REMARKS |
|------------|----------|---------|
|            |          |         |

| JOB PRIOR. | ACT. REQ. | ACT. TXN. | COND. REC. | REP. HRS. | CAL HRS. | SER. HRS. | PARTS COST | SER/REP DATE | CAL DATE |
|------------|-----------|-----------|------------|-----------|----------|-----------|------------|--------------|----------|
|            |           |           |            |           |          |           |            |              |          |

| SER. REP. TECH. | CAL TECH. | OUTSIDE SERV. COST | NMIS ENTRY CODE | STD. 1 | STD. 2 | STD. 3 |
|-----------------|-----------|--------------------|-----------------|--------|--------|--------|
|                 |           |                    | R-C R C S OS    |        |        |        |

| DATE | SERVICE DETAILS | PARTS COST | APPR. |
|------|-----------------|------------|-------|
|      |                 |            |       |
|      |                 |            |       |
|      |                 |            |       |
|      |                 |            |       |
|      |                 |            |       |
|      |                 |            |       |
|      |                 |            |       |
|      |                 |            |       |
|      |                 |            |       |
|      |                 |            |       |

| ACQ. COST | LARC ORDER NO. | P.O. CODE | AUTO CODE | NMIS |
|-----------|----------------|-----------|-----------|------|
|           |                |           |           |      |

|   |   |
|---|---|
| <p><b>SHIP TO:</b><br/> <input type="checkbox"/> WYLE <input type="checkbox"/> MM&amp;T <input type="checkbox"/> GE<br/> <input type="checkbox"/> WORK ORDER ONLY<br/> <input type="checkbox"/> Other _____<br/>                 Rec'd. by _____ Date _____<br/>                 Organization _____</p> | <p><b>RETURN TO:</b><br/> <input type="checkbox"/> NASA Langley Research Center, Bldg. 1230<br/> <input type="checkbox"/> WORK ORDER ONLY<br/> <input type="checkbox"/> Other _____<br/>                 Rec'd. by _____ Date _____<br/>                 Organization _____</p> |
|---|---|

SERVICE COPY

Exhibit "D"

| REJECTION REPORT                                 |  |   |   |  |
|--|--|---|---|--|
| ORDER/CONTRACT NO.                               | SHIPPER'S NO.  | <input type="checkbox"/> UPS            | <input type="checkbox"/> PARCEL POST  |  |
|  |  | <input type="checkbox"/> COMMON CARRIER | <input type="checkbox"/> OTHER  |  |
| 1  | TO: 138/PURCHASE BRANCH, AD  |   |   |  |
|  | MATERIALS BEING HELD   |   |   |  |
|  | DATE RECEIVED  | RECEIVED FROM                           |   |  |
|  | <input type="checkbox"/> Overage <input type="checkbox"/> Not As Ordered <input type="checkbox"/> Not Ordered <input type="checkbox"/> Damaged                                     |   |   |  |
|  | BRIEF DESCRIPTION  |   |   |  |
|  | SIGNATURE OF LOGISTICS MANAGEMENT BRANCH OFFICIAL  |   | DATE  |  |
| 2  | TO: 373/TRANSPORTATION & WAREHOUSING SECTION, LMB, MSD   |   |   |  |
|  | ACCEPT MATERIAL (Check one)  |   |   |  |
|  | <input type="checkbox"/> As Overage <input type="checkbox"/> Per Modification <input type="checkbox"/> As Received   |   |   |  |
|  | RETURN MATERIAL (Check one)  |   |   |  |
|  | <input type="checkbox"/> Transportation Collect <input type="checkbox"/> UPS and Deduct Charges <input type="checkbox"/> VIA Co. Truck-Shipper Notified                            |   |   |  |
| RETURN MATERIAL TO SHIPPER.<br>LABEL AS FOLLOWS: |  | DATE FORWARDED                          |   |  |
| _____<br>ATTN:                                   |  | _____<br>_____<br>_____                 |   |  |
| 3  | TO: CONSIGNEE  |   |   |  |
|  | <input type="checkbox"/> Credit our order with returned material.<br><input type="checkbox"/> Forward satisfactory replacement.<br><input type="checkbox"/> Error in packing slip: |   | → From: NASA Langley Research Center<br>Mall Stop 373<br>Hampton, VA 23665-5225 |  |
|  | <input type="checkbox"/> Ship balance.<br><input type="checkbox"/> Bill quantity received.   |   |   |  |
|  | SIGNATURE OF PURCHASE BRANCH OFFICIAL  |   |   |  |
|  |  | DATE                                    |   |  |

|   |                |                |                    |               |            |
|---|----------------|----------------|--------------------|---------------|------------|
| TO (USER)   |                | DATE           |                    | ECN/SER NO.   |            |
| BUILDING NO.  | ROOM NO.       | PHONE          | MAIL STOP          | USER NO.      |            |
| FROM  |                | LAB NO.        | W. O. NO.          | J. O. NO.     |            |
| MATERIAL (Description, Qty., Make, etc.)  |                |                |                    |               |            |
|   |                |                |                    |               | NO. PIECES |
| <input type="checkbox"/> SURVEY   | CONDITION CODE | REPAIR COST \$ | T.M. APPROVAL      |               |            |
| <input type="checkbox"/> REPAIR/CALIBRATE   |                |                |                    | T.M. APPROVAL |            |
| NEW MATERIAL RECEIPT  |                |                | ORDER/CONTRACT NO. | T.M. APPROVAL |            |
| ACCEPTANCE TEST: <input type="checkbox"/> COMPLETE <input type="checkbox"/> DELAY <input type="checkbox"/> NOT REQUIRED |                |                |                    |               |            |
| DELIVERY APPROVAL   |                | DRIVER         | DATE               |               |            |
| RECEIVED BY (Print Payroll Number)  |                | SIGNATURE      | DATE               |               |            |

U.S. GPO: 1986-626-856  
63576

NASA Langley Form 162 (January 1984)

107358

COPY 1 SHIPPER'S COPY

-PRINT LEGIBLY USING BALL POINT PEN OR TYPEWRITER-

**SHIPPING/TRANSFER DOCUMENT** Mark all deliveries with Government Contract Order Number

FROM: NASA Langley Research Center  
 Attn: Wyle Laboratories  
 3200 Magruder Blvd.  
 Hampton, VA 23666-1498

SHIP TO

SHIP  Collect  Prepaid  Handcarried  
 JOB ORDER NO. AUTHORIZING SHIPMENT

REFERENCE NO.

DATE

SHIPMENT CONTROL NO.

ORIGINATOR

ORGANIZATION TELEPHONE NO.  
 WYLE (804) 865-0000 EXT.

APPROVALS  
 APPROVING OFFICIAL  
 OTHER

DOES SHIPMENT CONTAIN  
 (Check all applicable blocks)

YES NO  
 LARC Property    
 Controlled Equipment    
 Classified Property    
 If classified, specify:  
 Confidential    
 Secret    
 Hazardous Property    
 (Complete and attach Langley Form 44 or 44A and attach MSDS)

PROPERTY WILL BE  
 Traded In  
 Returned Under Warranty  
 Repaired  
 Rejected  
 A Returned Lease  
 Loaned  
 A Returned Loan  
 Incorporated Into End Item  
 Expended During Use  
 Other (Specify)

ATTN: NAME

RMA

RECIPIENT'S COMMERCIAL PHONE NO.  
 ( )

TRANSFER OF ACCOUNTABILITY  
 To Another NASA Center  
 To Another Government Agency  
 To a Contractor/Grantee

ITEM NO. NSN, NOUN NAME, MANUFACTURER, MODEL, & SERIAL NO.

EQUIPMENT CONTROL NO.

QUANTITY SHIPPED

UNIT OF ISSUE

UNIT PRICE

TOTAL PRICE

NO. OF PIECES WEIGHT TYPE OF CONTAINER GBL NO. DATE SHIPPED MODE OF SHIPMENT TAGS REMOVED  YES  NO

TO BE COMPLETED BY TRANSPORTATION OFFICE

PAGE TOTAL  
 GRAND TOTAL

CONTRACTOR DOCUMENT USED TO NOTIFY VENDOR(S) THAT AN  
ITEM(S) HAS BEEN REJECTED AS PER PARAGRAPH 3.A.1 "ACTION  
REQUIRED SUBSEQUENT TO PREPARATION AND DISTRIBUTION OF  
THE R&I."

EXHIBIT "H"

CONTRACTOR CONTACT REPORT USED TO DOCUMENT  
CORRESPONDENCE BETWEEN VENDOR(S) AND CONTRACTOR AS  
PER PARAGRAPH 3.A.2 "ACTION REQUIRED SUBSEQUENT TO  
PREPARATION AND DISTRIBUTION OF THE R&I."

EXHIBIT "I"

DELAY PAYMENT MEMORANDUM

Memo To: Commerical Accounts Section, FMD, M/S 175.

From: IRD Technical Monitor \_\_\_\_\_ M/S \_\_\_\_\_

Subject: Confirmation of telephone call made on  
(Date: \_\_\_\_\_) for the purpose of withholding payment, for  
the reasons stated, on the referenced items.

Reference: Order/Contract No. \_\_\_\_\_

ECN No(s). (or other) \_\_\_\_\_

| _____<br>(Nomenclature) | _____<br>(Mfg.) | _____<br>(Model) |
|-------------------------|-----------------|------------------|
| _____                   | _____           | _____            |

Remarks: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**CONTRACTOR DOCUMENT USED TO NOTIFY VENDOR(S) THAT AN  
ITEM(S) HAS BEEN REJECTED AS PER PARAGRAPH F.1.G  
'DISCREPANCIES'**

**EXHIBIT 'K'**



to Affn of 138

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

SHOW CAUSE FOR DELINQUENT DELIVERY

Subject: NASA Purchase Order No. L- \_\_\_\_\_, Copy Attached

Date of Order: \_\_\_\_\_ Delivery Date: \_\_\_\_\_

Since you have failed to perform Order No. L- \_\_\_\_\_ within the time required by its terms, the Government may terminate this order for default. However, in order for the Government to make a final decision on this issue, it must determine if your failure to perform has resulted from causes beyond your control and without fault or negligence on your part. Therefore, you may present, in writing, any facts explaining your failure to perform. Your letter must be provided to \_\_\_\_\_, (804) 864-\_\_\_\_\_, within 10 days after you receive this notice. Your failure to provide an explanation within this time may be interpreted as an admission that none exists. You are advised that the rights and obligations of both the Government and the Contractor are stated in the Default clause of this order.

If the Government provides assistance to you on this order or accepts any delinquent goods or services, it will be solely for the purpose of mitigating damages; it is not the Government's intention to condone delinquency or to waive any of the Government's rights under this order.

Contracting Officer

ATTACHMENT 11

LANGLEY HANDBOOK (LHB) 5330.9, LANGLEY RESEARCH  
CENTER (LaRC) METROLOGY PROGRAM (OCTOBER 1986)

LHB 5330.9  
OCTOBER 1986

**NASA**  
Langley Research Center

LANGLEY RESEARCH CENTER (LaRC) METROLOGY PROGRAM

National Aeronautics and Space Administration

## PREFACE

This handbook establishes the Langley Research Center (LaRC) Metrology Program to ensure the quality of instruments used in precision measurements. This program uses controlled procedures and standards to ensure measurement traceability for instrumentation for LaRC's research and development programs, facility operations, and fabrication activities. Measurement areas are defined for which instrument calibration is required. Reporting requirements for instruments overdue for mandatory calibration are defined.

This handbook will be maintained by the Pressure and Flow Measurement Section, Instrument Application Branch, Instrument Research Division in consultation with representatives from organizations engaged in instrument calibration services.



William D. Mace  
Director for Electronics



Paul F. Holloway  
Deputy Director

### DISTRIBUTION:

236/Head, Pressure and Flow Measurement Section,  
IRD (50 copies)  
Property Custodians  
SDL 065 - Directors, Offices Reporting to Directors,  
and Division Chiefs  
SDL 130 - Reliability and Quality Assurance Manual  
Distribution List, LaRC  
233/Head, Instrument Control Office, IRD (2 copies)  
238/William E. Quinn, Force and Strain Instrumentation  
Section, IRD (2 copies)  
267/Head, NTF Operations Branch, TAD (2 copies)  
166A/Head, Fluid Systems Section, OSD (2 copies)  
387/Head, Quality Assurance and Inspection Office, FD  
(2 copies)  
171/Willie E. Wright, Jr., Laboratory and Plant  
Electrical Section, OSD (2 copies)  
238/William R. Phelps, TRCO/Modern Machine and Tool Company  
(2 copies)  
390/Larry L. Harvey, Sr., TRCO/RCA Services Co. (2 copies)  
236/Charles C. Laney, Jr., TRCO/Wyle Laboratories (Instrument  
Support) (3 copies)  
123/Directives Office, Institutional Support Branch,  
MSD (10 copies)

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## Chapter 1

## 1.0 INTRODUCTION

## 1.1 Purpose

This handbook describes the Langley Research Center (LaRC) Metrology Program established to ensure the quality of instruments used in precision measurements at LaRC. It outlines the procedure for calibration and control for laboratory standards, precision measurement instruments, and test equipment that is used to support LaRC's research and development programs, facility operations, and fabrication activities. NMI 5330.9, "Metrology and Calibration," requires every NASA field installation to have a ". . . centralized uniform calibration system that utilizes controlled standards to assure that measurements are traceable to National standards . . ." The primary purpose of this program is to ensure the accuracy of instruments used for measurements where substantiated data accuracy is required.

## 1.2 Scope

Defined are responsibilities of LaRC organizations in developing, implementing, and controlling the LaRC Metrology Program. Established are policy, requirements for standards traceability, instrument labeling, a recall system for mandatory calibration of instruments, calibration procedures, and documentation requirements.

## 1.3 Applicability

The provisions of this handbook are applicable to: (1) all LaRC organizations engaged in precision measurements that require instrument calibration services and (2) unless otherwise specified by contractual requirements, LaRC contractors engaged in metrology and calibration activities.

## 2.0 DEFINITIONS

- 2.1 Calibration - Comparison between two instruments or devices, one of which is a standard of known accuracy, to detect, correlate, report, and/or adjust any deviation in the accuracy of the instrument being compared.
- 2.2 Calibrated Equipment - Equipment whose precision has been verified by an approved and authorized calibration laboratory.
- 2.3 Calibration Interval - An established interval of time between calibrations of instruments where the interval is determined and adjusted periodically, by tolerance data and usage.
- 2.4 Calibration Laboratory - An isolated area which is equipped and authorized to perform calibrations and inspections of precision measuring and test equipment.
- 2.5 Calibration Procedures - Detailed written instructions for performing calibrations; may also include software programs for automatic calibration systems.
- 2.6 Calibration Record - A document for a specific instrument consisting of indications/outputs of the standard and the instrument, labor expended, parts cost, calibration interval, maintenance data, a statement of calibration errors, clerical data, and standards used in the calibration.
- 2.7 Certification - The process used to determine the performance of the higher class of instruments used in the calibration and verification process. The higher class of instruments consists of Reference Standards, Transfer Standards, and Working Standards. This process requires a formal document stating the actual performance of the standard and must include test data acquired, a statement defining the measurement uncertainty of the calibration process employed, and identification of all instruments used in the test.
- 2.8 Check Calibration - A test performed on-site, usually prior to an experiment or tunnel test, to verify the system performance and end-to-end system precision.
- 2.9 Control Chart - A graphic technique to demonstrate the existence of statistical control of a measurement process, and to monitor that controlled process as one basis for decision making.
- 2.10 Controlled Equipment - All capital equipment, with an acquisition cost of \$500 or more, that has an estimated life of 1 year or more, and will not be consumed or expended in an experiment. Also includes selected items of equipment designated and identified as sensitive by the Logistics Management Branch, Management Support Division.

- 2.25 Operational Check - A test performed on an instrument to determine that it operates and performs its intended functions. No conformance to accuracy specification is implied. No data record is maintained other than the service label which is dated and affixed to the instrument.
- 2.26 Property Custodian - An individual assigned property management responsibilities for an organization's controlled equipment.
- 2.27 Recall System - A systematic operation to ensure that Reference, Transfer, Working Standards, and, as applicable, instruments are recalled from the users at prescribed intervals.
- 2.28 Standards:
- 2.28.1 National - Standards maintained by the National Bureau of Standards (NBS). National standards constitute the highest level of accuracy and legal basis for a measurement system in the United States.
  - 2.28.2 Reference - Standards one-step-removed from and calibrated against National Standards. Reference standards constitute the highest level of accuracy within the NASA installation.
  - 2.28.3 Transfer - Standards used to transfer accuracies from reference standards to working standards.
  - 2.28.4 Working - Standards used in the calibration and/or certification of inspection, measuring, and test equipment.
- 2.29 Traceability - The process by which the uncertainty in the calibration of an instrument can be traced through a series of calibrations to a natural physical constant or nationally recognized standards.
- 2.30 Uncertainty Ratio - The ratio of the measurement uncertainty of the test instrument to the uncertainty of the standard. The uncertainty ratio for a calibration should be at least 4:1. However, state-of-the-art limitations in standards may make this ratio unachievable, thus requiring special calibration and data analysis techniques.



### 3.0 METROLOGY AND CALIBRATION SYSTEM RESPONSIBILITIES

- 3.1 LaRC Directors for - Comply with the calibration requirements of LMI 5330.9, "Metrology and Calibration," and this handbook within their areas of responsibility.
- 3.2 Chief, Instrument Research Division - Establish and operate a systematic recall system for all Reference, Transfer, and Working Standards and other appropriate instrumentation owned and used by this Center.
- 3.3 Property Custodians and Users -
  - 3.3.1 Ensure that all instruments, devices, and artifacts, controlled and noncontrolled, used in their organizations that fall into the categories listed in Chapter 6, "LaRC Calibration Recall Program," are calibrated according to the provisions of this handbook and are properly maintained.
  - 3.3.2 Ensure that standards used for in-place calibration are entered into the LaRC Calibration Recall Program.
  - 3.3.3 Ensure that precision measurement and test equipment are entered into the LaRC Calibration Recall Program as dictated by its use.
  - 3.3.4 Ensure the deletion of standards and precision measurement and test equipment from the LaRC Calibration Recall Program with the concurrences of the Property Custodian and the Chief, Instrument Research Division or the Chief's designee.
- 3.4 Contractors - Establish and operate a recall system for their Reference, Transfer, and Working standards, and other instrumentation used to support this Center's research, facility operations, and fabrication activities, whether Government Furnished Equipment (GFE) or contractor owned.
- 3.5 Head, Pressure and Flow Measurement Section -
  - 3.5.1 Develop policies and procedures that assure a well defined, consistent, and cost effective metrology system that meets the research and operational requirements of this Center.
  - 3.5.2 Coordinate policy and procedures with the organizations responsible for the operations.
  - 3.5.3 Develop and maintain calibration standards and calibration program traceability to National Standards for research measurement instrumentation.
  - 3.5.4 Calibrate and repair research measurement instrumentation.

#### 4.0 CALIBRATION PROCEDURES

- 4.1 Calibration, inspection, and service of standards, devices, artifacts and precision measurement and test equipment will be performed in accordance with manufacturer's recommended procedures whenever possible. Other sources for calibration procedures are, but not limited to Government - Industry Data Exchange Program, Navy Metrology Engineering Center, Instrument Society of America, National Conference of Standards Laboratories, and other NASA Centers.
- 4.2 Whenever a procedure is not available, a procedure will be developed to ensure the calibrations are performed in a uniform, controlled manner. These procedures may be either written instructions or software programs developed for automatic calibration systems.

## 5.0 CLASSIFICATION OF STANDARDS

5.1 Purpose - The LaRC Metrology Program utilizes calibration standards in a number of measurement disciplines to provide traceability of the Center's research and operational measurements to National Standards. This traceability may be obtained through: (1) direct calibration with the National Bureau of Standards; (2) a calibration through a manufacturer or outside calibration laboratory which demonstrates measurement traceability to National Standards; (3) artifacts and reference materials supplied by the National Bureau of Standards; and (4) an established, recognized procedure. All LaRC measurement standards, whether Government owned or Government furnished equipment to a contractor will be classified and labeled according to their usage. All LaRC Standards will be entered into the NMIS, identified by the appropriate NMIS Recall Identification Code, and labeled according to their usage.

### 5.2 Measurement Standards Classifications:

5.2.1 LaRC Reference Standard - Standards one-step-removed from and calibrated against National Standards. Reference Standards constitute the highest level of accuracy within the LaRC Metrology Program and provide the first step of the Center's measurement traceability. A NASA Reference Standard Label will be affixed to the standard.

5.2.2 LaRC Transfer Standard - Standards used to transfer the accuracy and measurement traceability from Reference Standards to Working Standards. A NASA Transfer Standard Label will be affixed to the standard.

5.2.3 LaRC Working Standard - Standards used in the calibration and/or certification of precision measurement and test equipment for research, facility operations, and inspection activities. A NASA Working Standard Label will be affixed to the standard.

### 5.3 Documentation

5.3.1 Records are to be maintained to demonstrate the uncertainty and calibration/repair history of all standards. These records may include, as appropriate, the purchase request and specifications, manufacturer's calibration data, National Bureau of Standards calibration data, LaRC calibration or inspection data, calibration interval, calibration and repair hours, outside service cost, and repair or service history. These records are to be maintained for a period of time sufficient to demonstrate the uncertainty of the standard and, as appropriate, a measure of any drift characteristics for predicting calibration intervals, uncertainty as a function of time, or replacement.

5.3.2 Calibration control charts are to be maintained on all Reference Standards, as appropriate, showing the measurement uncertainty levels as a function of time to determine state of statistical control and prediction of error trends.

5.3.2.1 A copy of the control chart and updated charts for each standard will be provided to the Head, Pressure and Flow Measurement Section.

#### 5.4 Contractor Documentation

5.4.1 Contractors engaged in instrument calibration and maintenance in support of LaRC's research and operational programs are to meet documentation requirements unless otherwise required by their contract.

## Chapter 6

## 6.0 LaRC CALIBRATION RECALL PROGRAM

- 6.1 The LaRC Calibration Recall Program provides for controlled, periodic calibration or service for standards and selected instruments, devices, and artifacts. The selection is dictated by the use of that particular instrument, device, or artifact.
- 6.2 It is mandatory that instruments, devices, and artifacts used in the following processes are to be calibrated and entered into the LaRC Calibration Recall Program:
  - 6.2.1 Instruments, devices, and artifacts used to calibrate, repair, or service instruments, devices, artifacts, and machines.
  - 6.2.2 Instruments, devices, and artifacts used in new instrument acceptance testing or manufactured article inspection testing.
  - 6.2.3 Instruments, devices, and artifacts used in a measurement process where accuracy is essential for the safety of personnel.
- 6.3 Other instruments, devices, and artifacts, according to their usage as specified in LMI 5330.9, are to be calibrated and may be entered into the LaRC Calibration Recall Program.
  - 6.3.1 These specific use categories are:
    - 6.3.1.1 Instruments, devices, and artifacts used in the inspection of flight and/or qualification hardware when a calibration accuracy is critical to mission success and data are accuracy sensitive.
    - 6.3.1.2 Instruments, devices, and artifacts used in research and development testing or special applications where the specification/end products and research data are accuracy sensitive.
    - 6.3.1.3 Instruments used in telecommunication, transmission, and test equipment where exact signal interfaces and circuit confirmations are essential.
    - 6.3.1.4 Instruments, devices, and artifacts used for other applications where it is cost effective and essential for measurement quality assurance.
- 6.4 Responsibility
  - 6.4.1 The Property Custodian or user is responsible for identifying instruments, devices, and artifacts which are either required or optionally selected to be entered into the LaRC Calibration Recall Program.

- 6.4.1.1 Items are entered into the LaRC Calibration Recall Program, by written request, to the Metrology Control Center, Instrument Control Office, Instrument Research Division, mail stop 233, extension 2162.
- 6.4.1.2 Items may be deleted from the LaRC Calibration Recall Program by submitting a written request to the Chief, Instrument Research Division or the Chief's designee through the cognizant Property Custodian, explaining the change in use from that described in paragraphs 6.2 and 6.3.

## 6.5 Operation

- 6.5.1 The Metrology Control Center is to initiate and distribute instrument recall notices identifying instruments contained in NMIS requiring mandatory calibration or service during the next 30 days, and those which are overdue for calibration or service. The notices will identify the instrument by ECN or MCN, item name, location, and date calibration due. The notices are to be distributed by the fifth day of each month.
- 6.5.2 The Metrology Control Center is to notify the appropriate officials of items which have not been submitted for calibration as required. Delinquent notifications are to be distributed according to the following schedule:
  - 6.5.2.1 Report listing all instruments, devices, and artifacts overdue in excess of 30 days to the responsible Property Custodian.
  - 6.5.2.2 Report listing all instruments, devices, and artifacts overdue in excess of 60 days to the cognizant Division Chief and the Head, Pressure and Flow Measurement Section.
  - 6.5.2.3 Report listing all instruments, devices, and artifacts overdue in excess of 90 days to the cognizant Director for and the Head, Pressure and Flow Measurement Section.

## 7.0 CALIBRATION INTERVALS

### 7.1 Policy

7.1.1 Standards, devices, artifacts, and precision measurement and test equipment contained in the LaRC Calibration Recall Program are to be recalled for calibration at predetermined periodic intervals.

### 7.2 Calibration Interval Establishment

7.2.1 Calibration intervals may be established from several sources. These sources are, but not limited to, the manufacturer, the Navy Metrology Requirements List, LHB 5300.1, "Reliability and Quality Assurance Manual," and calibration laboratory experience. For the latter, calibration interval establishment is to include available data on reliability of the item, stability of design, number and performance history of like items tested, usage, environment, and application.

### 7.3 Calibration Interval Adjustment

#### 7.3.1 Longer Intervals

7.3.1.1 The lengthening of calibration intervals beyond those established by paragraph 7.2.1 is to be accomplished on an item-by-item basis only when sufficient performance data is available to ensure that measurement uncertainty and performance will not be degraded during the extended interval.

7.3.1.2 The laboratory performing the calibration will be responsible for determining the magnitude of the increase in interval. For calibrations performed by an LaRC contractor operated laboratory, interval adjustment requires the approval of the appropriate technical monitor if different from paragraph 7.2.1.

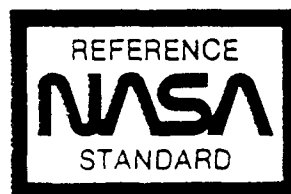
7.3.2 Shorter Intervals - Shorter intervals may be established under the following criteria:

7.3.2.1 The user requires a shorter interval to assure that the measurement uncertainty of the specific item is maintained for the specific application.

7.3.2.2 Calibration data and performance history indicates that a shorter interval is required to increase the probability that the measurement uncertainty and performance will be maintained.

## 8.0 CALIBRATION SYSTEM LABELS

- 8.1 **Purpose** - The LaRC Metrology Program utilizes a system of labels to identify the calibration status of each instrument, device, and artifact, and to classify those used as standards. This system consists of Agency-wide labels and labels developed to satisfy requirements unique to the LaRC Metrology Program.
- 8.2 **Applicability** - All LaRC organizations and their Support Service Contractors engaged in the calibration and repair of instruments, devices, and artifacts will utilize this system of labels.
- 8.3 **New Labels** - Additional labels necessary to support the research and operational activities of this Center will be submitted to and approved by the LaRC Metrology Working Group (described in Chapter 9).
- 8.4 **Label Supply** - The Head, Pressure and Flow Measurement Section, or the Head's designee is responsible for maintaining an adequate supply of calibration system labels.
- 8.5 **Exceptions**
- 8.5.1 LaRC organizations and Support Service Contractors that service items not entered in NMIS are not required to utilize this system of labels.
- 8.5.2 Check calibrations performed by LaRC facility personnel or contractors do not require the application of labels to the instrument tested.
- 8.6 **Labels** - All instruments, devices, and artifacts serviced are to be labeled with the appropriate calibration label(s).
- 8.6.1 **Reference Standard** - The NASA Metrology label identifies those instruments, devices, or artifacts which represent the highest level of accuracy and are used to provide measurement traceability to National Standards.



Red lettering on yellow background in sizes 1" x 1.5" and 0.5" x 0.75".

- 8.6.2 **Transfer Standard** - The NASA Metrology label identifies those instruments, devices, or artifacts which are used to transfer the measurement accuracy from Reference Standards to Working Standards.





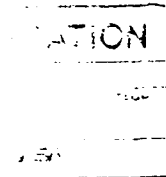
Blue lettering on yellow background in sizes 1" x 1.5" and 0.5" x 0.75".

- 8.6.3 Working Standard - The NASA Metrology label identifies those instruments, devices, or artifacts used to calibrate, test, or inspect other items.



Black lettering on yellow background in sizes 1" x 1.5" and 0.5" x 0.75".

- 8.7 Calibration - The NASA Metrology label identifies by ECN, MCN, or serial number the instrument, device, or artifact calibrated, the date calibrated, and the calibration interval. This label is used when the instrument was compared with a calibrated standard(s) or instrument(s) and determined to perform within specifications over all ranges/parameters/functions.



Blue lettering on a silver background in sizes 0.9" x 1.5" and 0.5" x 0.9".

- 8.8 Limited Use Calibration - The NASA Metrology label identifies the instrument, device, or artifact for which a complete calibration has not been performed or one which does not meet specifications but is still usable. The label identifies the limitation for use, the ECN, MCN, or serial number, the date calibrated, and the calibration interval.

Green or orange lettering on silver background in sizes 1" x 1.5" and 0.6" x 0.9".

- 8.9 **Serviced** - The LaRC Metrology label identifies: (1) instruments, devices, or artifacts which have had maintenance or repair and do not require calibration; or (2) when maintenance or repair is performed and the instrument calibration is not affected. In these instances, the service and the calibration labels will be affixed to the instrument; however, the next calibration date will not be affected.

Blue lettering on silver background in sizes 0.9" x 1.5" and 0.5" x 0.9".

- 8.10 **NASA-LRC** - The LaRC Metrology label identifies pressure gages calibrated by the Operations Support Division by year gage was calibrated and lists maximum pressure, date tested, and technician.

|                 |       |
|-----------------|-------|
| <b>NASA-LRC</b> |       |
| Max. P          | _____ |
| Test Date       | _____ |
| Tested by       | _____ |

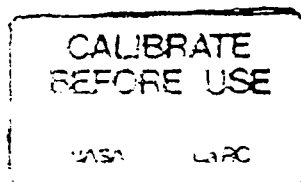
Black lettering on a silver background in size 0.75" x 0.75".

- 8.11 **Modified** - The LaRC Metrology label identifies instruments, devices, or artifacts which have been modified from the original performance specifications, design, or operation. The label identifies the document or source defining the modification.

|                 |       |
|-----------------|-------|
| <b>MODIFIED</b> |       |
| Refer to:       | _____ |
| _____           | _____ |
| NASA            | LaRC  |

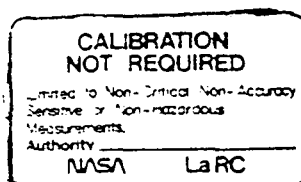
Red lettering on a silver background in size 0.9" x 1.5".

- 8.12 **Calibrate Before Use** - The LaRC Metrology label identifies instruments, devices, or artifacts which: (1) must be calibrated before using; (2) are not included in the mandatory LaRC Calibration Recall Program and are out-of-calibration and not expected to be used for a period of time; or (3) are included in the mandatory LaRC Calibration Recall Program and are put in a hold status. For the latter two criteria, the label is applied directly over the calibration label.



Orange lettering on a silver background in size 0.9" x 1.5".

- 8.13 Calibration Not Required - The NASA Metrology label identifies instruments, devices, or artifacts which, because of their specific use, do not require calibration and are limited to noncritical, nonaccuracy sensitive, or nonhazardous measurements.

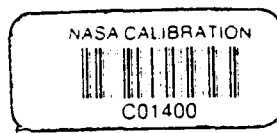


Red lettering on a silver background in sizes 0.9" x 1.5" and 0.5" x 0.9".

- 8.14 Calibration Recall Instrument - The LaRC Metrology label identifies instruments, devices, or artifacts which are included in the LaRC Calibration Recall Program.

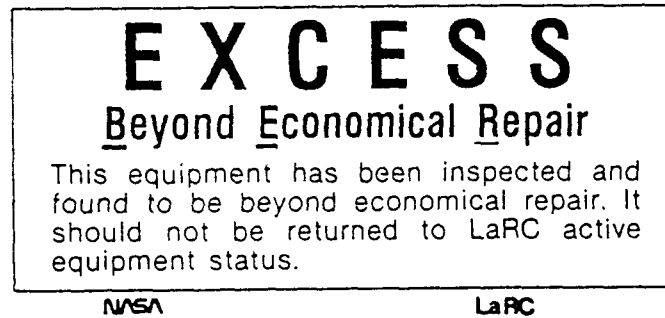
Green lettering on a silver background in size 0.5" x 0.9".

- 8.15 Metrology Control Number - The NASA Metrology label identifies instruments, devices, or artifacts not having an Equipment Control Number, but requiring a unique identification for the LaRC Metrology Program tracking within the NMIS. This label is bar coded in a 3-of-9 format and shows the control number.



Black lettering on a white background in size 0.6" x 1.4".

- 8.16 **Excess** - The LaRC Metrology label identifies an instrument, device, or artifact that is Beyond Economical Repair (BER), should not be returned to an active status, and is to be recommended for an excess action.



Red lettering on white background in sizes 4" x 2" and 2" x 1".

## 9.0 LaRC METROLOGY WORKING GROUP

9.1 The LaRC Metrology Working Group is established and will be the primary forum for developing, coordinating, and assuring a uniform metrology program among the LaRC organizations providing calibration services to this Center.

### 9.2 Charter

9.2.1 Authority and Scope - This charter assigns the responsibilities in accordance with LMI 5330.9 for metrology and calibration. The LaRC Metrology Working Group is to operate within the following guidelines:

9.2.1.1 Membership is to be composed of representatives from civil service and contractor organizations involved in the performance of calibration services at LaRC.

9.2.1.2 The Head, Pressure and Flow Measurement Section will be responsible for: advising members when meetings are to be held, presiding at meetings, and presenting recommendations for consideration by management.

9.2.1.3 Meetings are to be held quarterly with additional meetings scheduled as necessary.

9.2.1.4 Members are to represent their sponsoring organizations in providing a point of contact for coordination and implementation of recommended actions and LaRC Metrology Program requirements.

### 9.2.2 Objectives

9.2.2.1 Provide a forum to assure coordination between related disciplines, personnel, resources, and tasks to resolve calibration problems and issues at LaRC.

9.2.2.2 Provide a forum for the timely identification of calibration requirements generated by new technology, research programs, and facility initiatives.

9.2.2.3 Provide a forum for the exchange of information to assist the calibration service organizations in achieving their objectives.

9.2.2.4 Establish subtask working groups as required to solve specific problems.

9.2.2.5 Provide recommendations for new or revised actions and procedures to resolve problems relating to metrology and calibration.

- 9.2.2.6 Develop periodic reports and recommendations to responsible Center management as required.
- 9.2.2.7 Resolve problems and recommend actions which require the integrated effort of the calibration organizations - civil service or contractor.

ATTACHMENT 12

LANGLEY MANAGEMENT INSTRUCTIONS (LMI) 5330.9,  
METROLOGY AND CALIBRATION DATED JANUARY 10, 1991



National Aeronautics and  
Space Administration

# Langley Research Center MANAGEMENT MANUAL

LMI 5330.9

January 10, 1991

**SUBJECT:** Metrology and Calibration

## SUMMARY

This instruction:

- Incorporates NMI 5330.9, "Metrology and Calibration" (see Attachment) into this Center's Management Manual.
- Sets forth policy and responsibilities.

## POLICY

Langley Research Center (LaRC) will comply with the policy set forth in NMI 5330.9 and in prescribing NASA and Federal regulations.

## RESPONSIBILITIES

| Responsibility                              | Function   |
|---|--|
| Center Management Officials                 | Operate and maintain a Center metrology and calibration system as stated in NMI 5330.9.  |
| Chief, Instrument Research Division (IRD)   | <ul style="list-style-type: none"> <li>• Develop a metrology system including a systematic recall system for LaRC reference, transfer, and working standards and other appropriate instrumentation owned and used by this Center.</li> <li>• Assign an LaRC point of contact for equipment calibration.</li> <li>• Report quarterly on these activities to the Chief, Systems, Safety Quality and Reliability Division.</li> </ul> |
| NASA Property Custodians/<br>User Employees | <ul style="list-style-type: none"> <li>• Ensure that instrumentation used for the purposes defined in NMI 5330.9 are identified and entered into the recall system.</li> <li>• Identify instruments for deletion from the recall system and obtain concurrences of the Property Custodian and the Chief, IRD, or the Chief's designee.</li> </ul>  |
| Contractors                                 | Establish and operate recall system for instrumentation used to support this Center's research activities, whether Government Furnished Equipment (GFE) or contractor owned.   |

## REFERENCES

NHB 4200.1, "NASA Equipment Management Manual"

NHB 5300.4(1B), "Quality Program Provisions for Aeronautical and Space System Contractors"



LMI 5330.9

January 10, 1991

**NASA**National Aeronautics and  
Space Administration

Langley Research Center

**MANAGEMENT  
MANUAL****REFERENCES  
(Continued)**NHB 5300.4(1C), "Inspection System Provisions for  
Aeronautical and Space System Materials, Parts,  
Components and Services"NHB 5300.4(1D-2), "Safety, Reliability, Maintainability  
and Quality Provisions for the Space Shuttle Program"

LHB 5300.1, "Program Assurance Manual"

LHB 5330.9, "Langley Research Center (LaRC) Metrology  
Program"LHB 5330.10, "Metrology and Calibration Control System  
for Fabrication"LMI 4200.3, "Property Management - Research  
Instrumentation"LMI 5300.1, "Systems Safety, Quality and Reliability  
Program"**REVISION**

LMI 5330.9, dated September 5, 1979, T.S. 1020.


Richard H. Petersen  
Director

Attachment



# Management Instruction

NMI 5330.9AEffective Date July 27, 1990Expiration Date July 27, 1993

Responsible Office: QR/Reliability, Maintainability and Quality Assurance Division

Subject: METROLOGY AND CALIBRATION

## 1. PURPOSE

This Instruction establishes the NASA policy for test equipment, system calibration, and all other metrology functions.

## 2. APPLICABILITY

This Instruction applies to NASA Headquarters and field installations.

## 3. DEFINITIONS

For purposes of this Instruction the following definitions apply:

- a. Calibration. A comparison between two instruments or devices, one of which is a standard of known accuracy to detect, correlate, report, and/or adjust any deviation in the accuracy of the instrument being compared.
- b. Calibration Interval (Cycle). An established interval of time between calibrations of standards and test equipment where the interval is determined and adjusted periodically by reviewing tolerance data and usage.
- c. Decal. A small data label affixed to the standards and test equipment to readily determine the calibration status.
- d. Test Equipment. Gages; instruments; tools; fixtures; transducers; and measuring, monitoring, analysis, or diagnostic equipment used to measure static or transient phenomena to determine the characteristics or conformance to specifications of an article, material, system, process, or environment.

- e. Calibration Recall System. A control system which ensures that all standards and test equipment used in measurement processes are recalled for calibration at established intervals.
- f. Metrology. The science and technology of measurement.
- g. Traceability. The ability to relate individual measurement results to nationally accepted standards through a continuous sequence of controlled measurements within established limits of uncertainty.
- h. Standards
  - (1) National Standards. Standards maintained by the National Institute of Standards and Technology (NIST) and standards based on intrinsic or natural phenomena that may not be located at NIST, which constitute the legal basis for a national measurement system.
  - (2) Reference Standards. Standards of the highest accuracy maintained within a NASA field installation typically one echelon below national standards maintained by NIST.
  - (3) Transfer Standards. Standards which are calibrated by reference standards and used to calibrate working standards.
  - (4) Working Standards. Standards used for the calibration and/or certification of test equipment.
  - (5) System Standards. Standards integral to a system which are used to calibrate the system or monitor its uncertainty.

#### 4. POLICY

- a. The metrology and calibration control requirements of NHB's 5300.4(1B), "Quality Program Provisions for Aeronautical and Space System Contractors," 5300.4(1C), "Inspection System Provisions for Aeronautical and Space System Materials, Parts, Components and Services," or 5300.4(1D-2), "Safety, Reliability, Maintainability and Quality Provisions for the Space Shuttle Program," as applicable, will be included in all aeronautical and space contracts when test equipment is used for functions described in subparagraphs c and d.
- b. Each NASA installation will have:
  - (1) A system which provides for the management of standards and test equipment calibration and repair

July 27, 1990

data in a controlled process to ensure measurement traceability to national standards.

- (2) A recall system whereby standards and test equipment will be recalibrated at established intervals. Calibration intervals will be determined by calibration history and usage. Equipment whose accuracy is established at time of use by system standards and/or instruments whose usage is limited to the applications listed in subparagraphs e(1) and (2) may be exempt from this requirement.
  - (3) Calibrated standards and test equipment that will be uniquely identified and labeled, tagged, or coded to indicate calibration status and next calibration due date.
  - (4) Test equipment used as metrology standards identified with a label indicating its classification in the metrology environment.
  - (5) Procedures for test equipment repair and maintenance in conformance with the requirements of NHB 4200.1, "NASA Equipment Management Manual," paragraph 2.209.
- c. All test equipment used to perform measurements associated with the following functions shall be included in a recall system, calibrated at established intervals, and labeled to indicate calibration status and date of next calibration:
- (1) Acceptance testing of new instrumentation.
  - (2) Inspection, maintenance, calibration, and/or qualification of flight hardware.
  - (3) Measurement process where test equipment accuracy is essential for the safety of personnel.
- d. As a minimum, all test equipment used to perform measurements associated with the following functions shall be calibrated, labeled to indicate the calibration status and date of next calibration, and may be included in the calibration recall system:
- (1) Research and/or development, testing, or special applications where the specification/end products and research data are accuracy sensitive.

- (2) Telecommunication, transmission, and test equipment where exact signal interfaces and circuit confirmations are essential.
- e. Instruments used for purposes other than those specified in subparagraphs c and d and that are not included in the recall system will be considered as uncalibrated and shall be limited to:
- (1) Applications where substantiated measurement accuracy is not required.
  - (2) "Indication Only" purposes of nonhazardous, noncritical applications.

## 5. RESPONSIBILITIES

- a. Officials-in-Charge of Headquarters Program Offices are responsible for the implementation of the policies of this Instruction.
- b. The Associate Administrator for Safety and Mission Quality is responsible for providing functional metrology management and leadership in the implementation of the policies of this Instruction which includes:
- (1) Serving as the NASA focal point for agencywide metrology and calibration matters with other Government agencies, industry, and nonprofit organizations.
  - (2) Supporting the NASA Metrology/Calibration Working Group in its efforts to develop and maintain a coordinated and comprehensive agencywide metrology and calibration program.
  - (3) Supporting the timely development of standards and associated measurement techniques when adequate nationally accepted standards do not exist to support NASA program metrology requirements.
  - (4) Monitoring NASA field installation implementation of this Instruction.
- c. The Directors of NASA Field Installations are responsible for providing the necessary supporting efforts to implement this Instruction which includes:
- (1) Having instructions and implementing procedures in compliance with the requirements of this Instruction.
  - (2) Having access to reference standards, which constitute the highest level of accuracy within the

field installation, traceable to national standards.

- (3) Utilizing metrology data banks and coordinating with other NASA field installations for calibration procedures to avoid unnecessary repetition of procedure development effort.
- (4) Utilizing existing proximate calibration resources of the military services, other civil agencies, original manufacturers, and the private sectors when in-house capabilities are not available or are limited.
- (5) Supporting the calibration needs of other NASA installations and Government agencies when existing capacity and capability can provide for this support.
- (6) Having an automated calibration recall and data system which uniquely identifies and labels, tags, or codes measurement standards and calibrated instruments to indicate calibration status and due date of the next calibration, and maintains equipment calibration and repair data.
- (7) Timely development of calibration capabilities to ensure installation ability to support NASA program metrology requirements.
- (8) Implementing the policy set forth in paragraph 4a.
- (9) Providing formal representation to the NASA Metrology/Calibration Working Group workshops and other related activities.

6. CANCELLATION

NMI 5330.9 dated October 18, 1978.



George A. Rodney  
Associate Administrator for Safety  
and Mission Quality

DISTRIBUTION:  
SDL 1

ATTACHMENT 13  
CONTRACTOR-FURNISHED FACILITY REQUIREMENTS

## ATTACHMENT 13

CONTRACTOR-FURNISHED FACILITY REQUIREMENTS

The Government estimates that a facility which meets the following minimum requirements would sufficiently fulfill the needs of this contractual effort:

The facility should have adequate floor space (50,000 sq. ft.) to house Government-Furnished Equipment (GFE), Government-Furnished Materials (GFM), Contractor-Furnished Equipment (CFE), and personnel and should be configured such that required work can be performed in an orderly and efficient manner. The Contractor must furnish and connect all utilities required to properly operate GFE. NOTE: If necessary, relocation of Government-furnished equipment and materials from the incumbent's facility to the successful offeror's facility will be the responsibility of the Government. The facility should include the following:

- a. Compressed Air--Not less than 150 psi with flow rates to 15 cfm, with suitable regulators to comply with OSHA requirements and oil and water separators.
- b. Electric Power--Main service 880 kilowatts, 3 phase.
- c. Access Door--At least one 9- by 12-foot door suitable for truck loading and unloading.
- d. Laboratory Environment--Temperature  $75' \pm 10'$  at less than 60% relative humidity seven days per week.
- e. Secured stock room/spare-repair parts storage room.
- f. Network cabling to provide an ethernet local area network to support function areas.
- g. Suitable office and work areas including the following:
  - (i) Receipt and Inspection--Separate partitioned area with access door for truck loading and unloading; suitable storage shelves for incoming and outgoing instruments; secured area for storing new equipment prior to acceptance test.
  - (ii) Calibration-Benches to accommodate calibration personnel; storage area for standard equipment and delicate transducers and standards; area for accommodating pressure consoles, vacuum calibration standards, flow calibration consoles (gas and liquid), shakers centrifuge, rate table, shock calibrator, and other calibration equipment; water and compressed air; ventilated area for thermal calibration; special laboratory power 60 KVA, 115 V/230 V - 60 Hz single phase, and 115/230 V - 60 Hz three phase. Shall have a separate area for calibration of microphones with isolation of: 30 db (A weighted), 45 db (B weighted), 60 db (C weighted), and 70 db (wideband). Shall have a screen room for calibrations that require RFI elimination.
  - (iii) Repair and Maintenance--Benches to accommodate technicians and equipment' storage shelves and area for GFE and incoming/outgoing equipment; area to accommodate machine shop equipment lathes, milling machine, drill press, etc.;



files for approximately 14,000 service manuals; separate vented cleaning room with point booth and acid cleaning facilities; electric power - 115/230 V - 60 Hz, single phase, and an antenna with lead-ins for VLF and WWV receivers.

(iv) Engineering Application and Digital Systems Support--Suitable office environment to support engineering activities. Secured computer tape storage area for archiving master files. At least 400 square foot area with adequate utilities to support GFE software development minicomputers.

(v) Instrument Vehicle Parking--Adequate parking space for Government-furnished instrumentation vans and other instrumented vehicles; security against loss from theft, vandalism, etc., shall be provided by the Contractor.

ATTACHMENT 14

FAR PROVISION 52.203-8, REQUIREMENT FOR CERTIFICATE OF  
PROCUREMENT INTEGRITY (NOV 1990) ALTERNATE I (SEP 1990)

REQUIREMENT FOR CERTIFICATE OF PROCUREMENT INTEGRITY  
(FAR 52.203-8) (NOV 1990) ALTERNATE I (SEP 1990)

- (a) Definitions. The definitions at FAR 3.104-4 are hereby incorporated in this provision.
- (b) Certifications. As required in paragraph (c) of this provision, the officer or employee responsible for this offer shall execute the following certification:

CERTIFICATE OF PROCUREMENT INTEGRITY

(1) I, \_\_\_\_\_  
[Name of certifier]

am the officer or employee responsible for the preparation of this offer and hereby certify that, to the best of my knowledge and belief, with the exception of any information described in this certificate, I have no information concerning a violation or possible violation of subsections 27(a), (b), (d), or (f) of the Office of Federal Procurement Policy Act, as amended\* (41 U.S.C. 423), (hereinafter referred to as "the Act"), as implemented in the FAR, occurring during the conduct of this procurement

\_\_\_\_\_.  
(solicitation number)

(2) As required by subsection 27(e)(1)(B) of the Act, I further certify that, to the best of my knowledge and belief, each officer, employee, agent, representative, and consultant of \_\_\_\_\_

\_\_\_\_\_ [Name of offeror]

who has participated personally and substantially in the preparation or submission of this offer has certified that he or she is familiar with, and will comply with, the requirements of subsection 27(a) of the Act, as implemented in the FAR, and will report immediately to me any information concerning a violation or possible violation of subsection 27(a), (b), (d), or (f) of the Act, as implemented in the FAR, pertaining to this procurement.

(3) Violations or possible violations: (Continue on plain bond paper if necessary and label Certificate of Procurement Integrity (Continuation Sheet), ENTER NONE IF NONE EXIST) \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

(4) I agree that, if awarded a contract under this solicitation, the certifications required by subsection 27(e)(1)(B) of the Act shall be maintained in accordance with paragraph (f) of this provision.

\_\_\_\_\_  
[Signature of the officer or employee responsible for the offer and date]

\_\_\_\_\_  
[Typed name of the officer or employee responsible for the offer]

\*Subsections 27(a), (b), and (d) are effective on December 1, 1990.  
Subsection 27(f) is effective on June 1, 1991.

THIS CERTIFICATION CONCERNS A MATTER WITHIN THE JURISDICTION OF AN AGENCY OF THE UNITED STATES AND THE MAKING OF A FALSE, FICTITIOUS, OR FRAUDULENT CERTIFICATION MAY RENDER THE MAKER SUBJECT TO PROSECUTION UNDER TITLE 18, UNITED STATES CODE, SECTION 1001.

(End of certification)

(c) For procurements, including contract modifications, in excess of \$100,000 made using procedures other than sealed bidding, the signed certifications shall be submitted by the successful Offeror to the Contracting Officer within the time period specified by the Contracting Officer when requesting the certificates except as provided in subparagraphs (c)(1) through (c)(5) of this clause. In no event shall the certificate be submitted subsequent to award of a contract or execution of a contract modification:

(1) For letter contracts, other unpriced contracts, or unpriced contract modifications, whether or not the unpriced contract or modification contains a maximum or not to exceed price, the signed certifications shall be submitted prior to the award of the letter contract, unpriced contract, or unpriced contract modification, and prior to the definitization of the letter contract or the establishment of the price of the unpriced contract or unpriced contract modification. The second certification shall apply only to the period between award of the letter contract and execution of the document definitizing the letter contract, or award of the unpriced contract or unpriced contract modification and execution of the document establishing the definitive price of such unpriced contract or unpriced contract modification.

(2) For basic ordering agreements, prior to the execution of a priced order; prior to the execution of an unpriced order, whether or not the unpriced order contains a maximum or not to exceed price; and, prior to establishing the price of an unpriced order. The second certificate to be submitted for unpriced orders shall apply only to the period between award of the unpriced order and execution of the document establishing the definitive price for such order.

(3) A certificate is not required for indefinite delivery contracts (see Subpart 16.5) unless the total estimated value of all orders eventually to be placed under the contract is expected to exceed \$100,000.

(4) For contracts and contract modifications which include options, a certificate is required when the aggregate value of the contract or contract modification and all options (see 3.104-4(e)) exceeds \$100,000.

(5) For purposes of contracts entered into under section 8(a) of the SBA, the business entity with whom the SBA contracts, and not the SBA, shall be required to comply with the certification requirements of subsection 27(e). The SBA shall obtain the signed certificate from the business entity and forward the certificate to the Contracting Officer prior to the award of a contract to the SBA.

(6) Failure of an Offeror to submit the signed certificate within the time prescribed by the Contracting Officer shall cause the offer to be rejected.

(d) Pursuant to FAR 3.104-9(d), the Offeror may be requested to execute additional certifications at the request of the Government. Failure of an Offeror to submit the additional certifications shall cause its offer to be rejected.

(e) A certification containing a disclosure of a violation or possible violation will not necessarily result in the withholding of award under this solicitation. However, the Government, after evaluation of the disclosure, may cancel this procurement or take any other appropriate actions in the interests of the Government, such as disqualification of the Offeror.

(f) In making the certification in paragraph (2) of the certificate, the officer or employee of the competing contractor responsible for the offer may rely upon a onetime certification from each individual required to submit a certification to the competing Contractor, supplemented by periodic training. These certifications shall be obtained at the earliest possible date after an individual required to certify begins employment or association with the contractor. If a contractor decides to rely on a certification executed prior to suspension of Section 27 (i.e., prior to December 1, 1989), the contractor shall ensure that an individual who has so certified is notified that Section 27 is reinstated. These certifications shall be maintained by the Contractor for 6 years from the date a certifying employee's employment with the company ends or, for an agent, representative, or consultant, 6 years from the date such individual ceases to act on behalf of the Contractor.

(g) The certifications in paragraphs (b) and (d) of this provision are a material representation of fact upon which reliance will be placed in awarding a contract.