SYSTEMS ANALYSIS AND MISSION SUPPORT (SAMS)

Solicitation No. 1-132-RB.0002

List of Respondees to Source Sought Synopsis

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McLean, VA 22101

Infocom Technology, Inc.
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Paterson, NJ 07505

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Billerica, MA 01821

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Cleveland, OH 44142

Aero Systems Engineering(ASE) , Inc.
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Greenbelt, MD 20770

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2121 Eisenhower Avenue, Suite 2000
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Proton Aerospace
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Lockheed Martin Engineering & Sciences
Langley Program Office
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Hampton, VA VA 23681

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Hamilton Beach/Procter Silex
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Norfolk, VA 23502

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Lancaster, CA 93535

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Phoenix, AZ 85036

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Kirkland, WA 98034

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Fort Worth, TX 76116

Aerospace Innovations, LLC
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Yorktown, VA 23692

Quadrus Corporation
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Atlantic Beach, FL 32233

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Dallas, TX 75261-3018

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Tullahoma, TN 37388

Wiltex, Inc.
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Virginia Beach, VA 23456-4200

Science and Technology Corporation
10 Basil Sawyer Drive
Hampton, VA 23666

Zel Technologies, LLC
55 West Queens Way, Suite 208
Hampton, VA 23669

Micro Craft, Inc.
207 Big Springs Avenue
P. O. Box 370
Tullahoma, TN 37388

Syscom Development, Inc.
1110 Nasa Road, Suite 111
Houston, TX 77058

Science Applications International Corporation (SAIC)
One Enterprise Parkway, Suite 200
Hampton, VA 23666

Micro Analysis and Design, Inc.

Airborne Systems Competency Areas of Expertise

- Flight Dynamics
- Guidance & Control
- Crew Station Design and Integration
- Electromagnetics
- Mission-critical Digital Avionics Systems (including software)
- Aircraft Operations
- Piloted Simulation
- Research Systems Development

Key Personnel Assignments

Airborne Systems Competency

P. Douglas Arbuckle, Director
Luat T. Nguyen, Deputy Director for Controls, Flight Deck, and Flight Crucial Systems
H. Milton Holt, Deputy Director for Electromagnetics, Flight and Simulation Experimentation
Robert V. Gifford, Aviation Manager
Douglas B. Price, Special Assistant
Kathy H. Abbott, FAA National Resource Specialist for Flight Deck Human Factors
Kendall W. Sherman, Service Activity Manager
Vacant, Business Manager
Loutricia S. Johnson, Administrative Officer
L. David Wall, Center R&T Support Contracts Manager
Sandra G. Johnson (Lead)/Jo Ann H. Woodcock/Susan L. Conry, Secretaries

Simulation-to-Flight Office

Charles E. Knox, Manager

TRF Project Office

Richard H. Couch, Manager

Vehicle Dynamics Branch

Dana J. Dunham, Head

Dynamics & Control Branch

Dana J. Dunham, Acting Head
Martin R. Waszak, Acting Assist. Head

Guidance & Control Branch

Daniel D. Moerder, Acting Head

Crew Systems & Operations Branch

Sally C. Johnson, Head

Crew/Vehicle Integration Branch

Kelli F. Willshire, Head

Systems Integration Branch

Plesent W. Goode, Head

Assessment Technology Branch

Raymond S. Calloway, Head

Sensors Research Branch

Harry F. Benz, Head
Bruce M. Kendall, Assistant Head

Electromagnetics Research Branch

Thomas G. Campbell, Head

Aircraft Systems Branch

Tony L. Trexler, Head

Pilots Office

Harry A. Verstynen, Chief Pilot
Robert Rivers, Aviation Safety Officer

Quality Assurance Office

Michael A. Klebitz, Lead

Operations Engineering & Logistics Office

Lucille H. Crittenden, Lead

Airworthiness & Configuration Management

Brenton W. Weathered

Planning & Resources Office

Anita M. Thomas, Lead

Systems Development Branch

Carey S. Buttrill, Head
Vacant, Assistant Head

Approved: Original signed by P. D. Arbuckle
Organizational Unit Manager

Date: 12-17-99

ADVANCED ELECTROMAGNETIC TECHNOLOGY

- Computational Electromagnetic (CEM) Analysis
- High Intensity Radiated Fields (HIRF), EMI/EMC Testing
- Advanced Antenna Design
- Radar Cross Section (RCS) Measurements
- EM Material Characterization

AOE 6: CREW SYSTEMS

Situation Awareness Assessment

Synthetic Vision

Reduced Aircraft Spacing

Human-Centered Design

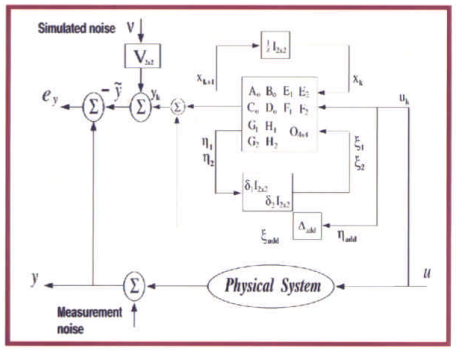
Tactical Weather Avoidance

Strategic Route Planning

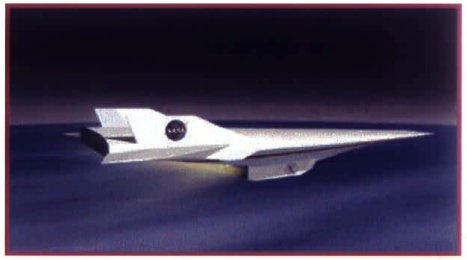
AOE 5: CONTROLS

Frequency / Time Dependency

Robust Theory

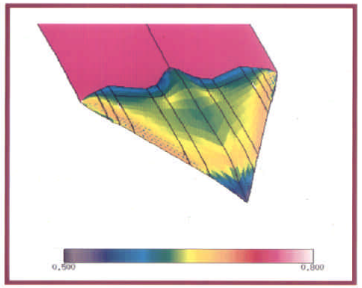


Transatmospheric Flight

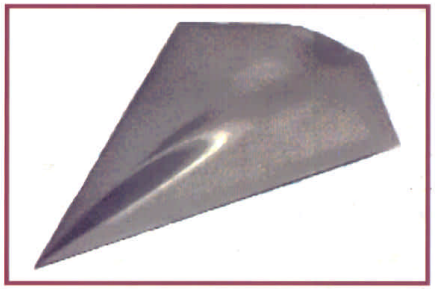


Dynamic Aeroelasticity

Multidisciplinary Integration



Controls Allocation / Reconfiguration



Multidisciplinary Modeling & Analysis

Guidance & Control Theory

Control Law Design

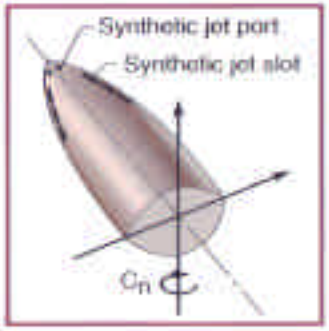
AOE 4: FLIGHT DYNAMICS

Vehicle Stability and Control

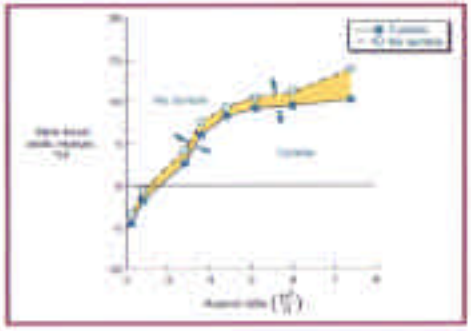
Spin Characteristics

Control Power Requirements

Control Concepts

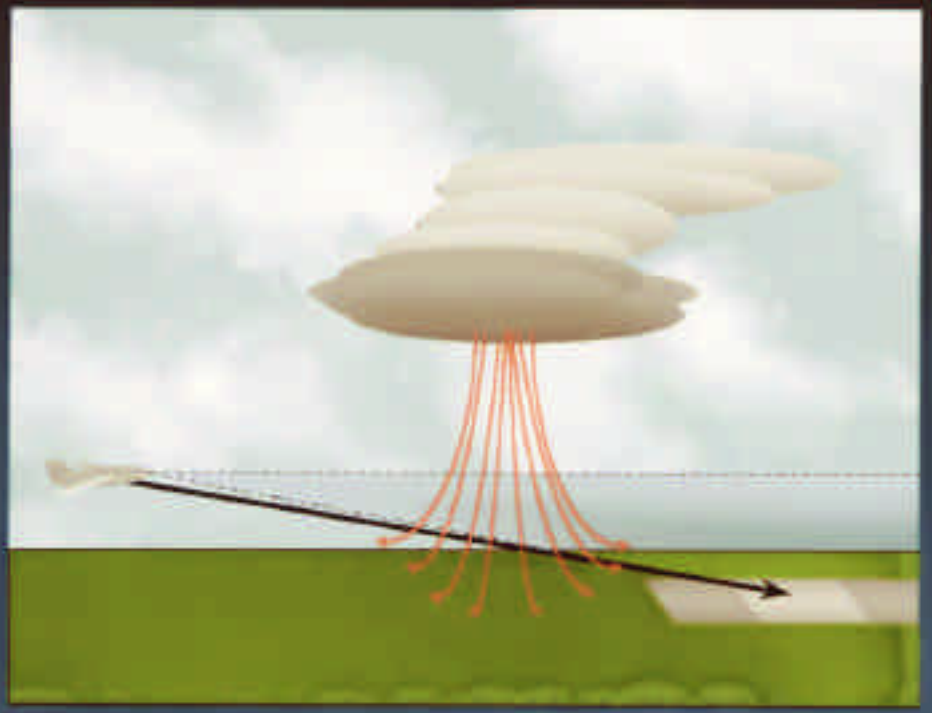


Design Criteria



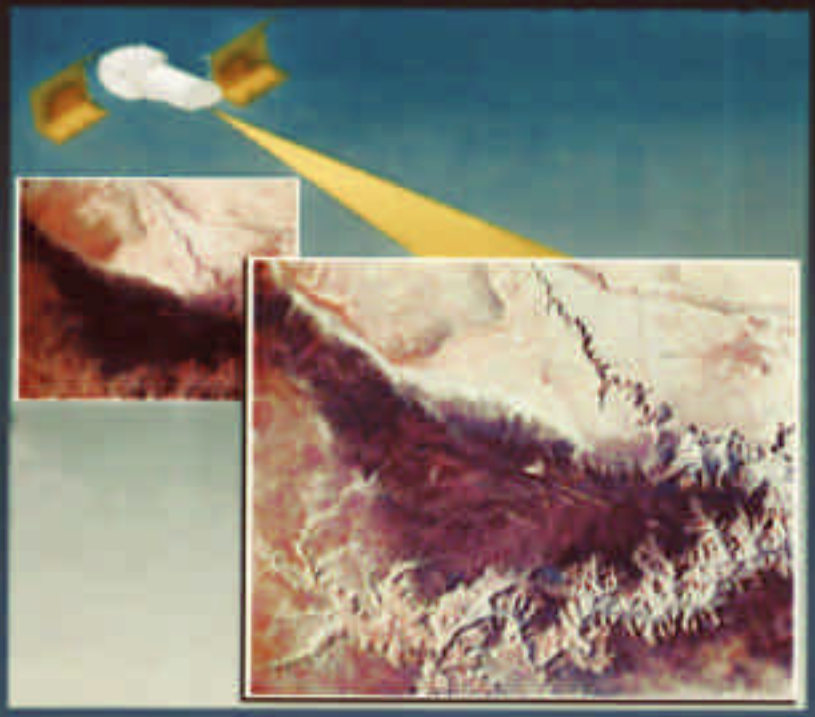
Sensor Systems Research

Aero-Focused Development



- Windshear Radar
- HSR - XVS
- AvS
  - Turbulence
  - EWxR
  - EVS

Space Technology



- Advanced Imaging
- Radiometry
- Semiconductor Lasers for LIDAR
- Retinex

NASA Langley Research Center

Electromagnetics Research & Testing Laboratories

NASA

Scale Model of B-737 in Antenna Chamber

Reverberation Chamber in the High Intensity Radiated Fields Laboratory

Installation of 28 Ft. Reflector in Experimental Test Range

Almond Calibration Test Model in RCS Compact Range

Gigahertz Transverse Electromagnetic Mode (GTEM) Test Cell

Scale Model Automobile in Antenna Test Chamber

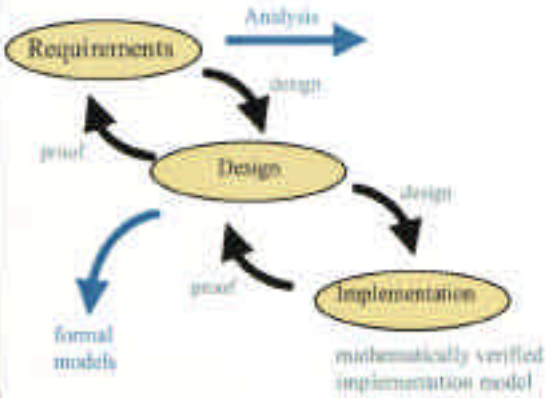
National Aeronautics and Space Administration — Langley Research Center

Develop and demonstrate methodologies for designing and verifying high integrity digital and electromagnetic systems in mission or life critical aerospace applications.

FCC in HIRF Test Chamber

Flight Simulation in Closed-Loop Sys. Lab

Methods to Assess EME Upset on Aviation Electronics



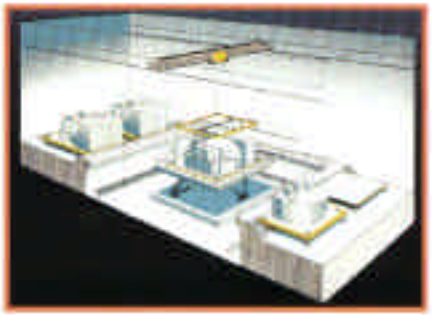
Formal Methods

Health Management & Flight Critical System Design Technologies

Research Aircraft and Research Simulators

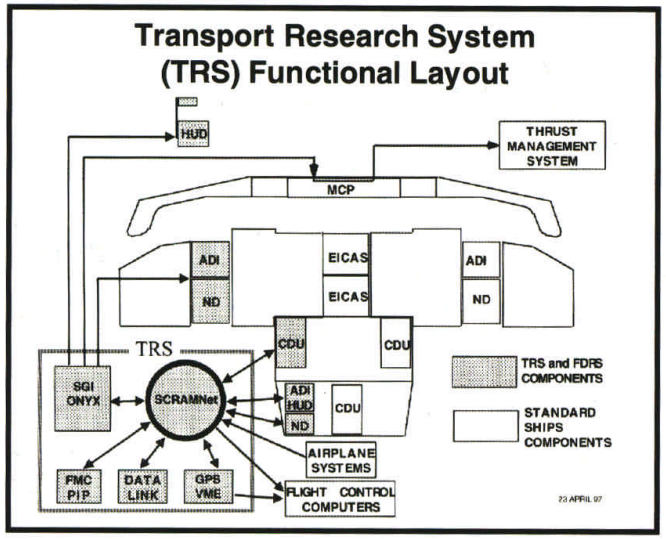
Differential Motion Simulator (DMS)

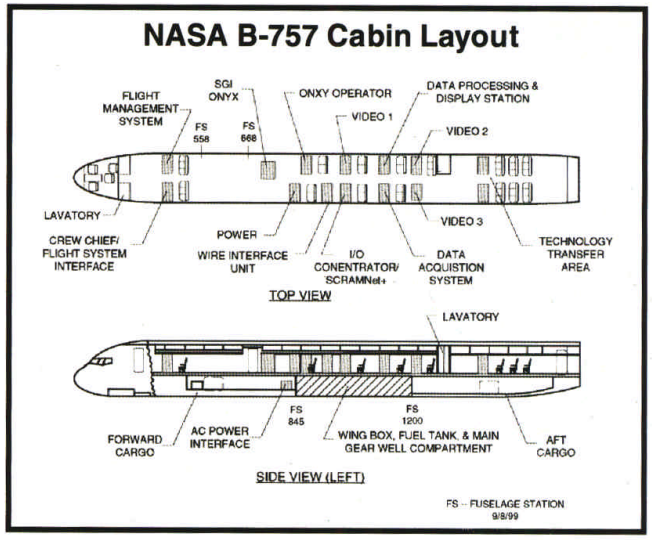
Visual Motion Simulator (VMS)



Cockpit Motion Facility (CMF)

NASA ARIES B-757





SOLICITATION 1-132-RB.0002
SAMS PRE-PROPOSAL CONFERENCE
APRIL 25, 2000

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Randy Locke	DYNACS	216-433-6110
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Sudhirc Mehrotra	Vigyan	757-865-1400
Jim McCaulley	Dyncorp	281-244-9700
Chuck McKinley	SAIC	757-827-4845
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Chuck Whittenberg	MTC	757-838-9152
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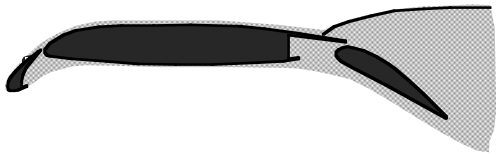
Tom Wilson	Swales Aerospace	301-902-4484
George Wood	Science and Technology Corp.	757-766-5800
Dave Ziobro	CSC	301-794-4000

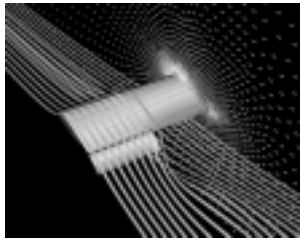
Aerodynamics, Aerothermodynamics, and Acoustics Competency
Areas of Expertise

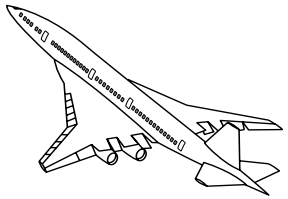
- Development, assessment, and application of aerodynamic and component integration technologies to enable development of advanced subsonic, supersonic, and high performance aircraft
- Development, assessment, and application of acoustic technologies in the development of advanced aerospace systems and to meet environmental requirements
- Development, assessment, and application of aerothermodynamic technologies to enable development of hypersonic aircraft, launch vehicles, and planetary/earth entry systems
- Development, assessment, and application of hypersonic airbreathing propulsion technologies to enable development of hypersonic airbreathing vehicles
- Development, assessment, and application of testing technologies to enable aerospace research through testing and experimentation in ground facilities
- Management and operation of aerodynamic, aerothermodynamic, acoustic, and hypersonic propulsion facilities for testing on a broad class of aerospace vehicles

AA.AE.01 Aerodynamic and Component Integration Technologies

Develop, assess, and apply aerodynamic and component integration technologies to enable development of advanced subsonic, supersonic, and high performance aircraft

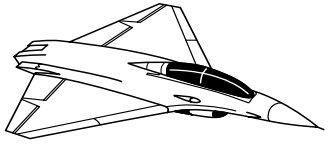






Products

- Vehicle performance, stability, and control
- Aerodynamic design tools and methodologies
- Advanced aerodynamic configurations for fixed wing, rotorcraft, and airbreathing propulsion concepts
- High lift and component integration aerodynamics
- Flow physics understanding and modeling
- Innovative flow control techniques



AA.AE.02 Aerothermodynamic Technologies

Develop, assess, and apply aerothermodynamic technologies to enable development of hypersonic aircraft, launch vehicles, and planetary earth entry systems

Products

- **Concept screening for flyability/survivability**
- **Configuration optimization**
- **Flight environment definition (benchmarking)**
- **Design tools and methodologies**

X-33

X-34

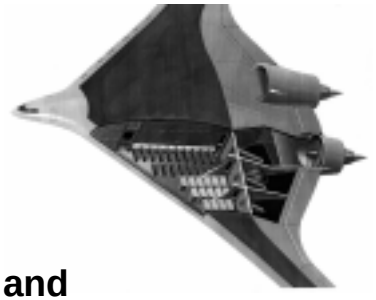
Hyper-X

Planetary

X-38

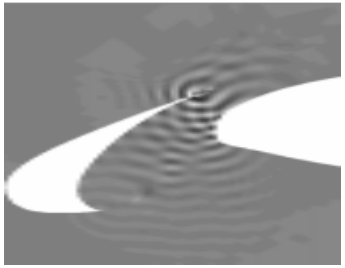
AA.AE.03 Acoustic Technologies

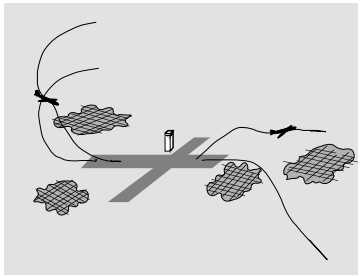
Develop, assess, and apply acoustic technologies in the development of advanced aerospace systems and to meet environmental requirements



Products

- **Computational methods for aeroacoustic design and analysis**
- **Airframe, fan, jet exhaust, and rotor noise control**
- **Active and passive aircraft interior noise control**
- **Advanced acoustic configuations for aerospace vehicles**
- **Sonic fatigue resistant aerospace structures**
- **Aeroacoustic measurements and flow diagnostics**
- **Community and passenger noise impact assessment**





Langley
Aerodyna
and Acoustics Competency

AA.AE.04 Hypersonic Airbreathing Propulsion Technologies

Develop, assess, and apply hypersonic airbreathing propulsion technologies to enable development of hypersonic airbreathing vehicles

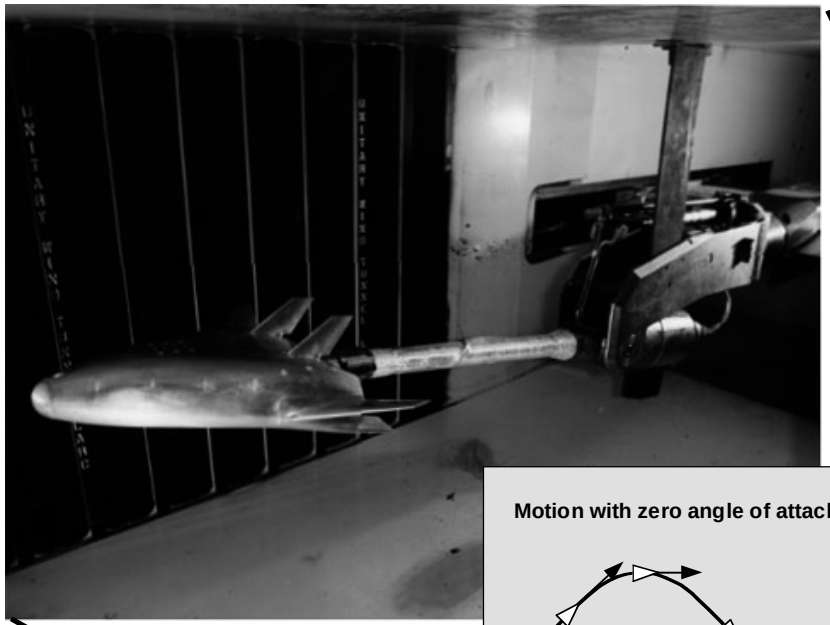
Small-scale parametric scramjet

Products

- **Scramjet engine flowpath design and performance**
- **Design tools and methodologies**
- **Fundamental physics of mixing and combustion**
- **Advanced testing techniques for scramjets**
- **Scramjet test facility development**

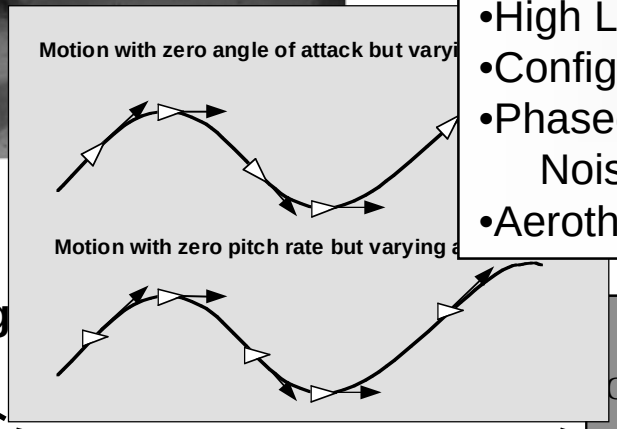
AA.AE.05 Test Capabilities For Industry

Manage, operate, and provide aerodynamic, aerothermodynamic, acoustic, and aero- and hypersonic-propulsion test capabilities for industry research and development on a broad class of aerospace vehicles.



Test Capabilities include:

- Supersonic performance
- Transonic performance testing at Flight Reynolds Number
- Dynamic Stability testing
- Static & Dynamic Ground Effects Testing
- Propulsion/Airframe Integration
- Rotorcraft Testing
- High Lift System Performance
- Configuration Screening
- Phased Microphone Array for Noise Source Identification
- Aerothermal Loads Testing

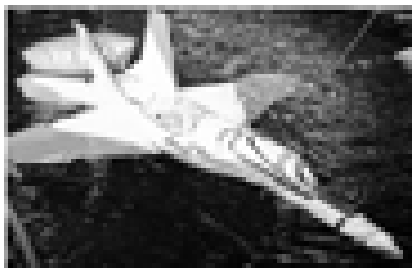


Dynamic Stability testing of X33 model in UPWT

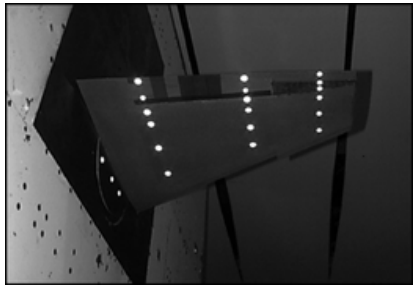
Damping-in-pitch,
$C_{m_q} + C_{m_\alpha}$
Oscillatory longitudinal stability,
$C_{m_\alpha} - k2\ C_{m_\theta}$
Damping-in-yaw,
$C_{n_\rho} - C_n \cos\alpha$
•
•
•

AA.AE.06 Experimental Testing Technologies

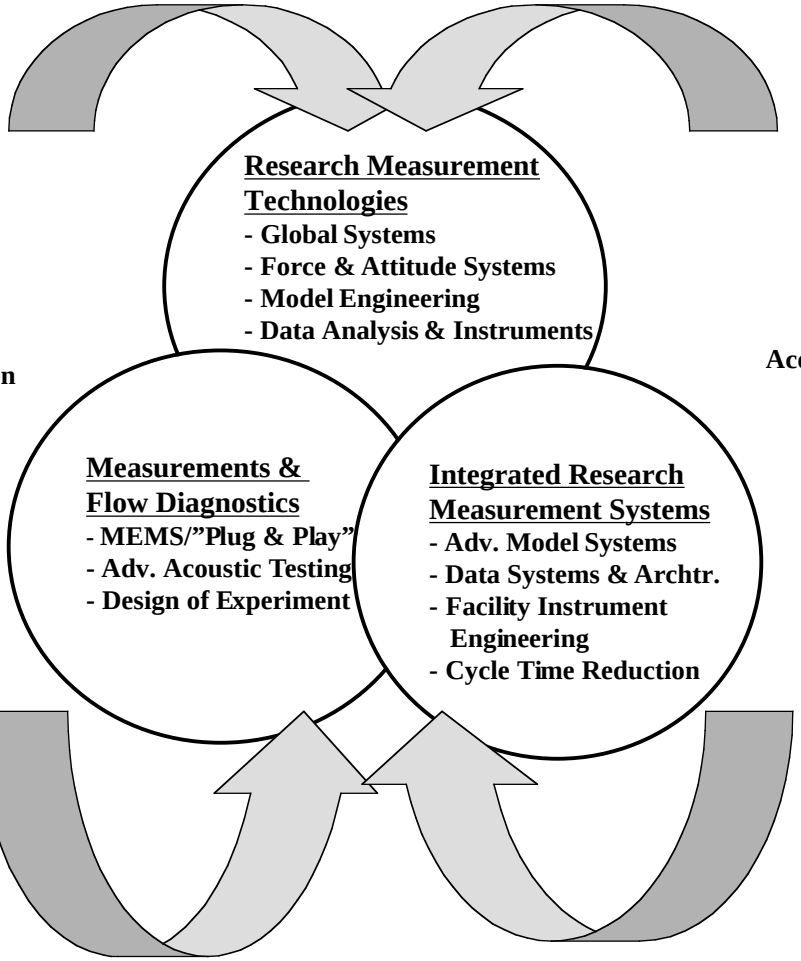
Develop, assess, apply, and integrate experimental testing technologies including test articles, instrumentation, data systems and test techniques to enable aero-space research through testing and experimentation in ground facilities.

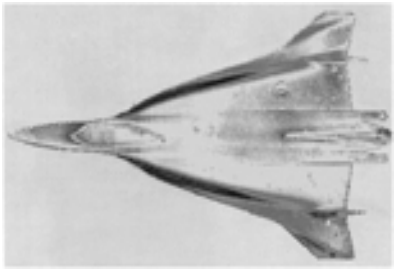


Model Engineering & Instrumentation



Acoustical, Optical, & Chemical Measurements





Aerodynamics Measurements

Data Systems & Instrument Support

Langley Research Center
Aerodynamics, Aerothermodynamics, and Acoustics Competency

Systems Analysis and Mission Support

Preproposal Conference

Solicitation 1-132-RB.0002

NATIONAL AERONAUTICS & SPACE ADMINISTRATION
LANGLEY RESEARCH CENTER

APRIL 25, 2000

SOLICITATION 1-132-RB.0002
SYSTEMS ANALYSIS & MISSION SUPPORT

PREPROPOSAL CONFERENCE

AGENDA

• **INTRODUCTION, SOURCE EVALUATION PROCESS, & PROJECTED SCHEDULE**	**HEDGEPETH**	**9:00 - 9:30**
• **WORK AREA OVERVIEWS:**		
– **AERODYNAMICS, AEROTHERMODYNAMICS & ACOUSTICS COMPETENCY**	**PAULSON**	**9:30 - 9:40**
– **AIRBORNE SYSTEMS COMPETENCY**	**PRICE**	**9:40 - 9:50**
– **STRUCTURES & MATERIALS COMPETENCY**	**SHUART**	**9:50 - 10:00**
– **SYSTEMS ENGINEERING COMPETENCY**	**TAYLOR**	**10:00 - 10:10**
– **AEROSPACE SYSTEMS , CONCEPTS & ANALYSIS**	**WEAVER**	**10:10 - 10:20**
– **SPACE ACCESS AND EXPLORATION PROGRAM OFFICE**	**McCLINTON**	**10:20 - 10:30**
• **BREAK**		**10:30 - 10:45**
• **QUESTION & ANSWERS**	**WEIH**	**10:45 - 11:30**
• **LUNCH**		**11:30 - 1:00**
• **FACILITY TOURS**		**1:00 - 3:00**

(STRUCTURES LAB, COLTS, LANDING LOADS & 14X22 TUNNEL)

Solicitation 1-132-RB.0002
SYSTEMS ANALYSIS AND MISSION SUPPORT

INTRODUCTION

- ALMOST ALL OF THE FACILITIES AND ORGANIZATIONS AT LaRC RECEIVE SERVICES UNDER THIS PROCUREMENT.
- SKILLS REQUIRED RANGE FROM DOCUMENTARIAN TO SENIOR RESEARCH SCIENTISTS.
- RESULTING CONTRACT WILL BE EXPECTED TO FEATURE A HIGH DEGREE OF FLEXIBILITY AND RESPONSIVENESS.
- EFFORTS ARE DEEMED “ESSENTIAL” BY ALL LEVELS OF MANAGEMENT.

SOLICITATION 1 - 132 - RB.0002
SYSTEMS ANALYSIS & MISSION SUPPORT

GENERAL GUIDANCE

- COPIES OF VIEWGRAPHS AND AN ATTENDANCE LIST WILL BE PROVIDED WITH THE FINAL RFP.

- ALL REVISIONS TO THE RFP WILL BE IN WRITING; NOTHING SAID HERE TODAY SHOULD BE CONSTRUED AS REVISION UNLESS SUBSEQUENTLY CONFIRMED IN THE FINAL RFP OR BY WRITTEN AMENDMENT.

- PREVIOUSLY SUBMITTED QUESTIONS WILL BE ADDRESSED DURING THE Q&A PERIOD. WRITTEN QUESTIONS TO BE COLLECTED DURING THE BREAK WILL BE ADDRESSED AT FINAL RFP RELEASE.

- AFTER THE FINAL RFP IS RELEASED, ALL QUESTIONS MUST BE SUBMITTED TO MR. WEIH.

SOLICITATION 1-132-RB.0002
SYSTEMS ANALYSIS AND MISSION SUPPORT

ESTIMATED CONTRACT STATISTICS

DIVISION OF EFFORT

• AIRBORNE SYSTEMS COMPETENCY	26%
• AAAC	18%
• S&M	17%
• S&E	13%
• SPACE ACCESS AND EXPLORATION OFFICE	10%
• AEROSPACE SYSTEMS, CONCEPTS & ANALYSIS	8%
• OTHERS	8%

SOLICITATION 1-132-RB.0002
SAMS PREPOSAL CONFERENCE - APRIL 25, 2000

NAME	COMPANY AFFILIATION	PHONE #

Solicitation 1-132-RB.0002

SYSTEMS ANALYSIS AND MISSION SUPPORT

PROCUREMENT INFORMATION

- ANY COMMUNICATION IN REFERENCE TO THIS DRAFT RFP MUST BE DIRECTED TO TOM WEIH, OR IN HIS ABSENCE, ROSEMARY FROEHLICH - SEE SECTION L.11

- THE RESULTANT CONTRACT WILL BE A SMALL BUSINESS SET-ASIDE UNDER SIC CODE 8731 - 1,500 EMPLOYEES

- THIS FOLLOW-ON PROCUREMENT REPRESENTS A CONSOLIDATION OF TWO LARC CONTRACTS:
  - NAS1-96013 WITH FDC/NYMA FOR SYSTEMS ANALYSIS AND ENGINEERING RESEARCH SUPPORT (SAERS)
  - NAS1-96014 WITH LOCKHEED FOR AEROSPACE RESEARCH AND TECHNOLOGY SERVICES (ARTS)

- PROPOSALS RECEIVED IN RESPONSE TO THE FINAL RFP WILL BE EVALUATED BY A NASA SOURCE EVALUATION BOARD (SEB) IN ACCORDANCE WITH NASA FAR SUPPLEMENT 1815.3. NOTE: THE FINAL RFP WILL BE REVISED TO REFLECT THE CORRECT NASA FAR SUPPLEMENT REFERENCE.

Solicitation 1-132-RB.0002

SYSTEMS ANALYSIS AND MISSION SUPPORT

PROCUREMENT INFORMATION

- IT IS LANGLEY'S INTENTION IS TO AWARD THE CONTRACT WITHOUT DISCUSSIONS IN ACCORDANCE WITH SECTION L.3, INSTRUCTIONS TO OFFERORS - COMPETITIVE ACQUISITION (FAR 52.215-1).

- ALL REFERENCES SUBMITTED IN RESPONSE TO THE INSTRUCTIONS ON PAST PERFORMANCE MAY BE CONTACTED BY NASA. PLEASE INSURE THAT THIS INFORMATION IS COMPLETE AND ACCURATE.

- THIS SOLICITATION INCLUDES WAGE DETERMINATIONS APPLICABLE TO THE "SERVICE CONTRACT ACT".

- COMPUTERIZED COST PROPOSAL - PLEASE READ THE INSTRUCTIONS CAREFULLY AND COMPLY WITH EACH REQUIREMENT (SECTION L.13 DRFP)

- INFORMATION REGARDING AN ELECTRONIC BIDDERS LIBRARY IS CONTAINED IN SECTION L.12. ALL OFFERORS ARE ENCOURAGED TO USE THE INFORMATION CONTAINED IN THE LIBRARY.

Solicitation 1-132-RB.0002
SYSTEMS ANALYSIS AND MISSION SUPPORT

RESPONSIBLE ORGANIZATIONS

Technical

Aerospace Systems, Concepts & Analysis Competency - William Gilbert
Aerodynamics, Aerothermodynamics, and Acoustics Competency - Ajay Kumar
Structures and Materials Competency - Mark Shuart
Airborne Systems Competency - Douglas Arbuckle
Systems Engineering Competency - Sammie Joplin
Other Program Offices and Organizations -

Procurement

Procurement Officer - Kimberly Stone
Contracting Officer - Rosemary Froehlich
Contract Specialist - Tom Weih

Solicitation 1-132-RB.0002
SYSTEMS ANALYSIS AND MISSION SUPPORT

SOURCE EVALUATION BOARD

- Voting Members:
  - Robert K. Hedgepeth (Chair), AAAC
  - Craig S. Cleckner, SEC
  - C. Tom Weih, Office of Procurement
  - Marilyn E. Ogburn, AirSC
  - Stan S. Smeltzer, SMC

- Recorder:
  - Jennifer D. McCardell, AAAC

- Price/Cost Analyst:
  - Jeanne D. Covington, Office of Procurement

- Office of Chief Counsel:
  - Kevin E. Love

SOLICITATION 1-132-RB.0002
SYSTEMS ANALYSIS & MISSION SUPPORT

TENTATIVE SCHEDULE

- COMMENTS DUE — MAY 5, 2000
- FINAL RFP RELEASE — MAY 19, 2000
- PROPOSALS DUE — JUNE 19, 2000
- CONTRACT AWARD — NOV. 1, 2000
- CONTRACT START — JAN. 1, 2001

Questions to the Draft RFP

1-132-RB.0002

Question 1. RFP L.13.B.1.(b) - Can a smaller font such as 8 point be used for graphics and tables?

Answer: 8-point font or higher is acceptable for graphics and tables provided that it is legible. This change will be reflected in the final RFP.

Question 2. Attachment 4 contains an Excel sheet entitled "Rate Chart." This sheet contains no data. Please provide additional instructions for the purpose of the Rate Chart.

Answer: The sheet entitled "Rate Chart" is there to provide a single place to display all rates, factors, and assumptions that are used in the Cost Form formulas. The use of the "Rate Chart" sheet is optional.

Question 3. Would the government provide the current ADP required seats by ODIN seat type?

Answer: ODIN information is currently unavailable. The nature and magnitude of ADP equipment and software that is currently being provided by the Government can be determined by reviewing the contracts and task orders contained in the Bidders Library.

Question 4. ADP Equipment (L.13.F.1.e) - For cost estimating purposes, please provide the quantities and types of ADP equipment and software (both CAD/analysis and PC workstation) that are currently being provided by the Government to the SAERS and ARTS contracts.

Answer: The nature and magnitude of ADP equipment and software that is currently being provided by the Government can be determined by reviewing the contracts and task orders contained in the Bidders Library.

Question 5. Can this equipment be utilized during contract phase-in to minimize work interruption?

Answer: The new Contractor will not perform Task Orders during the phase-in period. Consequently, no ADP equipment will be needed during this period.

Question 6. Should ODIN contractor support/equipment be delayed past November 1, 2000 into the contract effective date, can existing workstation equipment be utilized until ODIN support is available?

Answer: If the new Contractor clearly specifies the use of the ODIN contract to obtain ADP Equipment in their proposal, and if the ODIN contract is delayed beyond January 1, 2001, then existing ADP Equipment will be made available until the ODIN contract is

complete. In all other cases, existing workstation equipment will not be provided under the SAMS contract in accordance with FAR 45.302-1. Your attention is directed to Section L, L.13.F.1.e, which states that the Contractor shall supply and maintain automatic data processing (ADP) equipment and software for their use on this contract. Material, special test equipment, special tooling, or Agency peculiar property will be either charged direct to the contract or provided by the Government on a Task Order Basis.

Question 7. Can the required cost and staffing data for the Representative Task Orders be submitted in the Business Volume (Volume II), or are these data required in the Technical Proposal and subject to the 75 page limit?

Answer: The required cost and staffing data for the Representative Task Orders must be submitted with Technical Proposal – Volume I and will be subject to the 75 page limitation.

Question 8. Section G.1(f)(1) states that provisional fee payments will not be paid. Sections G.1(f)(2), (3), and (4) appear to describe how provisional fee will be handled. Which is correct?

Answer: Considering the award fee pool will not be finalized until the end of each 6-month evaluation period, provisional fee payments will not be made under this contract. However, any proposed methodologies on provisional fee payments submitted on or before May 5, 2000 will be considered by the Government.

Question 9. Section H.3 requires work performance (work hours/hours of work) to be consistent with the Government. Does this extend to Government holidays as well?

Answer: Offerors are referred to Section I, NASA FAR Supplement clause 1852.242-72, Observance of Legal Holidays – Alternate I for information regarding Government Holidays

Question 10. Our interpretation of Section I.6 is that overtime is allowable under the specified circumstances, but that the Government must approve all overtime. Is this correct?

Answer: Overtime is permitted without Government approval in the circumstances stated in paragraph (a)1 through (a)4 of FAR 52.222-2, Payment of Overtime Premiums.

Question 11. Please elaborate on - Volume I, Subfactor 1 Section L instructions to correlate the offeror's and subcontractor's expertise to each of the broad functional areas in the SOW ?

Answer: The instructions contained in Section L.13 of the RFP are provided in sufficient detail for offerors to provide an adequate response to the area in question.

Question 12. Please elaborate on (or better distinguish between) Volume I, Subfactor 2 Section L (3rd paragraph) instructions to describe the capabilities and depth of the offeror's organization (including subcontractors) for efficiently and effectively performing the contract effort?

Answer: The instructions contained in Section L.13 of the RFP are provided in sufficient detail for offerors to provide an adequate response to the area in question.

Question 13. Please elaborate on (or better distinguish between) - Business Volume, Factor 3, Past Performance requirements relative to related performance on other Contracts?

Answer: The instructions contained in Section L.13 of the RFP are provided in sufficient detail for offerors to provide an adequate response to the area in question.

Question 14. Is the letter from the Offeror committing to an ISO-9001 compliance schedule included in the Volume I page limit?

Answer: The letter is not included in the Volume I page limitation. This change will be reflected in the final RFP.

Question 15. Section D of the Draft RFP appears to be missing. Was this section intentionally omitted?

Answer: Section D was intentionally omitted as there are no clauses from that Section applicable to this procurement.

Question 16. Under the two current contracts, on-site office space is made available for Program Management personnel. Does the government intend to make space available for SAMS Program Management?

Answer: The Government intends to make space available for the SAMS Program Management.

Question 17. Will the compensation plan required under Subfactor 2 be counted in the 75 page limitation?

Answer: The compensation plan will be counted in the 75 page limitation.

Question 18. Please consider including hub-zone requirements into the contract.

Answer: In accordance with FAR Part 19, hub-zone requirements are not applicable to procurements set-aside for small businesses.

Question 19. Is there a moratorium on contractor visits/discussion about SAMS? Will the blackout coincide with the RFP release?

Answer: There is not a moratorium on contractor visits/discussion about SAMS; however, considering that the evaluation criteria have been released, it is requested and highly recommended that you pose all visits/discussion to Tom Weih. The official blackout will coincide with the final RFP release.

Question 20. Are the aircraft maintenance requirements still a part of SAMS?

Answer: The aircraft maintenance requirements are not a part of SAMS. These requirements will be fulfilled via another contract vehicle.

Question 21. RFP B.3 Award Fee - We recommend that the Government specify the award fee percentage, within the range of 8-10%, for all offerors to propose rather than have each offeror set their own fee percentage. Since the award fee is the Government's primary means of rewarding or encouraging improvements in performance we believe that it is in the Government's best interest to make sure that the percentage is large enough to warrant substantial attention from the contractor. If an offeror proposes a low award fee percentage their interest in performing to meet award fee evaluation criteria and their corporate interest in the SAMS contract are likely to be less than a contractor whose potential earned award fee is more substantial. Allowing an offeror to propose a low award fee percentage could result in a cost discriminator which would in fact have a negative impact on performance after contract award and defeat the purpose of the source selection process- providing the best contract service possible to SAMS contract users.

Answer: The Government does not plan on specifying an award fee percentage for this competition.

Question 22. RFP C.1 Statement of Work – Paragraph 4.3 Although the paragraph heading is titled Aircraft and Aircraft Systems Maintenance and Operations, the following paragraphs do not specify the requirement for typical aircraft maintenance. Are the aircraft in the Langley fleet going to be maintained under the SAMS effort?

Answer: The aircraft maintenance requirements are not a part of SAMS. These requirements will be fulfilled via another contract vehicle.

Question 23. RFP Statement of Work 9.0, Electronic Task Order System

a.) Is there an existing Electronic Task Order System which was funded by the Government for contractor use? If so, will information be provided regarding its capabilities, interfaces, and hardware/software platform requirements?

b.) Will the Government provide information regarding the interfaces (hardware, software) with which the Electronic Task Order System must be compatible?

Answer: There is not an existing Electronic Task Order System. There are no existing hardware/software platform requirements. Expected interfaces will be PC, MAC, and UNIX based systems.

Question 24. RFP G.1(f)(1) - Provisional award fee payments are normally allowed under NASA contracts. Will the Government reconsider allowing provisional award fee payments under the SAMS contract?. For small businesses it is very important to have regular cost and fee payments to meet fiscal obligations. Subparagraphs (2) through (4) which follow ensure that the Government's interests are well protected.

Answer: Considering the award fee pool will not be finalized until the end of each 6-month evaluation period, provisional fee payments will not be made under this contract. However, any proposed methodologies on provisional fee payments submitted on or before May 5, 2000 will be considered by the Government.

Question 25. RFP G.14 - Are the labor rates provided in the tables to be direct labor rates, loaded through G&A, or loaded through award fee? L13.G. specifies direct labor rates and associated indirect rates.

Answer: The labor rates in G.14 are NOT to be loaded through G&A or award fee. The Indirect rates should be specified separately as shown on the chart.

Question 26. RFP G.14 - Please clarify the difference between Project Planner and Scheduler/Cost Analyst. It is our understanding that Project Planner and Scheduler are often synonymous with each other at Langley.

Answer: The definitions of these support personnel are provided in Exhibit G to the RFP.

Question 27. RFP I.1 .B - Are paragraphs (e) and (f) included in Clause 1852.242-72?

Answer: Paragraphs (e) and (f) are part of Alt II to NASA FAR Supplement Clause 1852.242-72, which deals with the Observance of Legal Holidays. LaRC is still considering the inclusion of Alternate II and the Final RFP will reflect our decision.

Question 28. RFP I.13, Security Classification Requirements (NASA 1852.204-75) (SEP 1989) Our company already posses Top Secret facility and personal clearances. Will we be required to establish our own Top Secret facility clearance at Langley? If not, will the Government provide the Top Secret facility for storage and use of classified materials?

Answer: A Langley unique Top Secret facility clearance is not required. All storage and use of classified materials will be done by NASA Langley.

Question 29. RFP Exhibit A, DD 254 and Exhibit B, Contract Documentation Requirements. The DD 254 specifies Operations Security requirements, but the Exhibit B, the contract documentation requirements, does not specify an OPSEC Plan. Should an OPSEC Plan be added as a contract deliverable?

Answer: An OPSEC Plan is not required. The DD254 will be updated and included in the final RFP.

Question 30. RFP Exhibit B, Contract Documentation Requirements, and Exhibit E, Draft Award Fee Evaluation Plan Exhibit B specifies the Self Assessment Report be delivered 30 calendar days after completion of the evaluation period. Exhibit E specifies the Self Assessment Report be delivered 25 days after the end of the period. Which is correct?

Answer: The self assessment report shall be delivered 25 days after the end of each evaluation period. This change will be reflected in the final RFP.

Question 31. RFP Exhibit E, Draft Award Fee Plan Part III.C (Cost Analysis No. 1) This paragraph seems to have a wording problem. It is stated that if the percentage of tasks having Task Order Actual Costs that fall below 105% of the Task Order Planned Costs falls below 61% of tasks then the Award Fee score will be 0. It would appear that it is desirable for task costs to fall below 105% of the Task Order Planned Cost. Please clarify the wording and intent of this paragraph.

Answer: The last sentence under **Cost Analysis No. 1** which reads: "If the percentage of Tasks falls below 61 than the numerical score will be zero(0) for Cost Analysis 1," will be deleted from the Award Fee plan.

Question 32. RFP L.13.E - Technical Proposal Volume I:

(a) The DRFP does not require resumes for proposed Key Personnel. Is this intentional? If resumes are desired are they to be included in the Volume I 75-page limitation? Will the Government specify the desired contents of the resumes?

(b) Will key personnel resumes be evaluated? If so, please provide the evaluation criteria in Section M of the final RFP.

Answer: The Government does not plan on evaluating resumes or key personnel as part of this procurement.

Question 33. RFP L.13.E.1.b, Subfactor 2 – Management and Staffing - The first paragraph states that contract award is 1 November 2000 and contract effective date is 1 January 2001. To clarify, does this mean a 60 day transition overlapping the incumbent contractors' performance?

Answer: A 60-day transition period is planned; however, the actual work on Task Orders will not begin until January 1, 2000.

Question 34. RFP L.13.E.1.b Subfactor 2 – Management and Staffing - Since our Quality System Manual and associated procedures already address our approaches to contract and task management as well as other administrative functions, and they will be provided as attachments to Volume I, can they be incorporated by reference into our response to this subfactor?

Answer: No, an official response to this subfactor is required within the 75-page limitation.

Question 35. RFP L.13.F.1.3.e and G.12.C - These paragraphs state that offerors are to propose ADP equipment, general purpose equipment, machine tools and vehicles for the entire contract. We are concerned that the requirement to provide ADP and other equipment gives the incumbent contractors an unfair competitive advantage. Since they are allowed to purchase such equipment under their current contracts (as direct or indirect costs) they can reduce their proposed SAMS indirect costs by purchasing large numbers of computers now and then not proposing such costs in their SAMS offers. It is our understanding that at least one of the incumbents is in fact doing this. We strongly recommend the Government provide a fixed cost for all offerors to propose for ADP equipment, tools and other equipment to ensure that the incumbents do not have a competitive cost advantage.

Answer: Since the Government currently provides all equipment under the current contracts, it is unclear how the incumbents can have an unfair competitive advantage in this area. Therefore, the Government will not provide a fixed cost for all offerors to propose ADP equipment, tools and other equipment.

Question 36. Paragraph G.12 .C states that contractor supplied ADP equipment and software shall be compatible with the Langley Organization supported. Please provide a list of current ADP equipment and software being used by SAERS and ARTS contractor personnel. We need specific information on types and quantities of computers, software packages and number of users (for costing site licenses), and any other special ADP hardware required. In order to cost the number of printers and other shared peripherals required we need to know how the staff are distributed across the Center (i.e., how many persons can reasonably share a printer or other peripheral device?)

Answer: The nature and magnitude of ADP equipment and software that is currently being provided by the Government can be determined by reviewing the contracts and task orders contained in the Bidders Library. Additional information regarding the distribution of staff to assist you in preparing cost proposals will be provided in the final RFP.

Question 37. RFP L.13.F.1 The second paragraph states that the SAMS contractor may use the Langley ODIN Contractor services for ADP equipment and software. Since the first paragraph states that we must "clearly identify where these costs are considered in their proposal", please provide the Langley ODIN seat costs for equipment anticipated to be used by the SAMS successful offeror. The ODIN web site did not give sufficient information to meet pricing requirements. In the absence of ODIN cost data we suggest that the Government provide a fixed cost for all offerors to propose for ADP equipment and that appropriate revisions to the cost be allowed after the Code R ODIN award is made.

Answer: The LaRC ODIN seat costs are presently unavailable as a Contractor has not been selected. However, the seat costs from other NASA Centers are publically

available. The Government will not provide a fixed cost for all offerors to propose ADP equipment, tools and other equipment.

Question 38. RFP M.2.A.1 Subfactor 1 – Understanding the Requirements
This paragraph states that "The offeror's correlation of his expertise and that of significant subcontractors or teaming partners in each of the broad functional areas of the Statement of Work will be evaluated." Please clarify what is meant by "correlation of expertise".

Answer: The instructions contained in Section L.13 of the RFP are provided in sufficient detail for offerors to provide an adequate response to the area in question.

Question 39. Rate Chart -The Rate Chart is void in Excel Workbook. Will it be identical to the one in G.14?

Answer: The sheet entitled "Rate Chart" is there to provide a single place to display all rates, factors, and assumptions that are used in the Cost Form formulas. The use of the "Rate Chart" sheet is optional

Question 40. Cost Form C - Since many companies hold their benefits costs as proprietary information, is a note referencing their disclosed cost proposal acceptable to comply with Note 1?

Answer: Reference RFP Section L, paragraph L.13.F.1.c, subcontractors may submit proprietary cost information directly to the Government. Cost Form C, Note 1, requires that subcontracted categories be annotated. Thus, subcontracted and prime costs would then be supported separately.

Question 41. It is not possible to provide fixed numbers for the costs associated with some components of the fringe portion of an overhead pool since there are many variable elements such as:

(1) the company contribution to many 401(k) and "company pension plans" is a function of the employee's contribution.
(2) the amount of paid absence for all positions (Wage Determination included) is a function of service time.
(3) Civic Duty (Military, Jury) time is an overhead component and highly variable.

Is it acceptable to use averages used to establish Forward Pricing Rates Agreements for such variable quantities?

Answer: These elements are a part of your Defense Contract Audit Agency (DCAA) approved indirect rates. They are not expected to be derived separately for each category, but applied to each as an average apportionment of the total rate.

Question 42. Are the formulas requested in Note 2 to be annotated as text on the spreadsheet as well as explained in the text of the Business Proposal?

Answer: Formulas in spreadsheets should be self explanatory when supported by rationale in the text of the Business Proposal.

Question 43. Is an overhead cost element sheet used for justification for a FPRA acceptable to Comply with Note 4 for the "Other" elements since that is a required element of the Business Proposal? Or, should columns be added that sum into the "Other" column?

Answer: An explanation of elements in "Other" is adequate. Additional columns are not a requirement.

Question 44. Should rows for each subcategory classification (I - V) be added so as to provide the detail of Year 1 Payroll Tax and Fringe Benefit costs for each direct labor position?

Answer: The Cost Forms should reflect the weighted composite hourly labor rates and total category hours. Your spreadsheet must show how each rate was derived. There must be sufficient detail for the Government to evaluate the subcategory I-V labor rates, and verify the hours to the RFP.

Question 45. Cost Form B - This format provides for one category level per direct labor classification. Should rows for each subcategory classification (I - V) be added so as to provide the detail of productive hours and direct labor cost for each category classification?

Answer: The Cost Forms should reflect the weighted composite hourly labor rates and total category hours. Your spreadsheet must show how each rate was derived. There must be sufficient detail for the Government to evaluate the subcategory I-V labor rates, and verify the hours to the RFP.

Question 46. RFP L.13.B.2 stipulates that the proposal shall use "not smaller than 12 point type." It is easier to compose, read and evaluate figures and tables prepared using 9-point type. Please indicate the Governments willingness to accept figures and tables prepared using 9-point type?

Answer: 8-point font or higher is acceptable for graphics and tables provided that it is legible. This change will be reflected in the final RFP.

Question 47. The Research Test Pilots referenced in Exhibit G, Direct Labor Classification Descriptions is not mentioned in the SOW.

Answer: The Research Test Pilots may be required in individual Task Orders. The nature of work is defined in Sections 4.3 and 7.0 of the Statement of Work.

Question 49. **Page 13, G.1, AWARD FEE FOR SERVICE CONTRACTS (FAR 1852.216-76) (MAR 1998), (f)(1) and (2) through (4):** Paragraph G.1(f)(1) states that provisional award fee payments will not be made under the contract. However, Paragraphs G.1(f)(2) through (4) describe the process by which provisional award fee payments will be made. Please clarify the Government's intent as it relates to provisional award fee payments.

Answer: Considering the award fee pool will not be finalized until the end of each 6-month evaluation period, provisional fee payments will not be made under this contract. However, any proposed methodologies on provisional fee payments submitted on or before May 5, 2000 will be considered by the Government.

Question 50. **Pages 16, 19, & 89, deal with GFE**, Contractor supplied ADP equipment and software, and ODIN possibilities, but we would appreciate a statement of NASA's expectations. In particular, what will be the status of GFE currently in the possession of the incumbent contractors?

Answer: GFE in the possession of the current Contractors will not be made available under the SAMS procurement unless the conditions stated in Question 6 hold true. The nature and magnitude of ADP equipment and software that is currently being provided by the Government can be determined by reviewing the contracts and task orders contained in the Bidders Library.

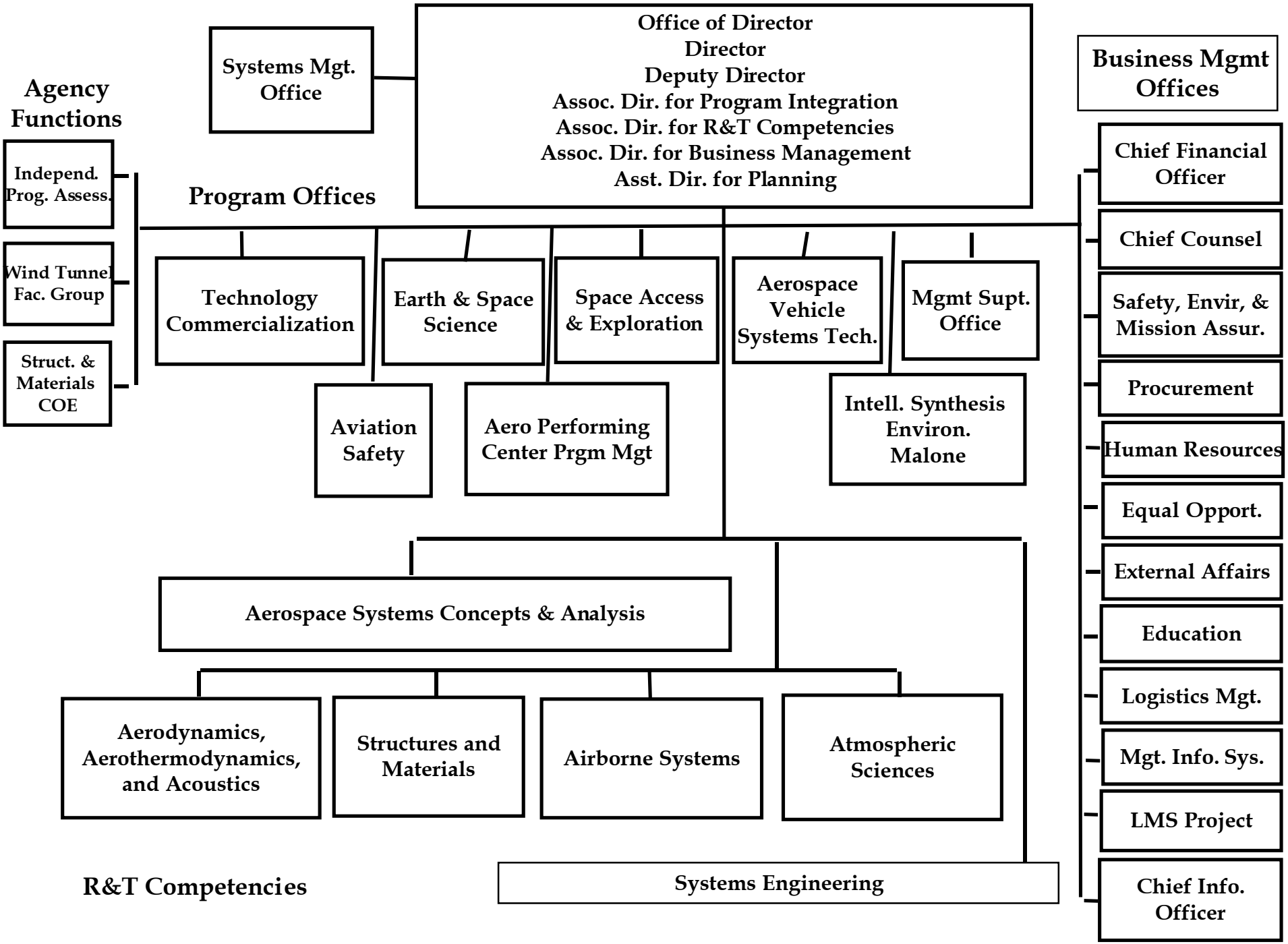
Question 51. **Exhibit E - Award Fee, Under Cost Analysis No. 1 there is the statement "If this percentage of tasks falls below 61 then the numerical score will be zero for Cost Analysis 1." Question:** Of the 25% allotted for cost evaluation how much is for Cost Analysis No 1 and how much is for Cost Analysis No 2?

Answer: Both Cost Analysis defined in the Award Fee Plan will be used as data points to assist the Award Fee Evaluation Board (AFEB) in the evaluation of the Cost Factor. The final score; however, will be determined by an subjective assessment of the Board. The statement in question will be deleted from the Award Fee Plan.

Systems Engineering Competency

Glenn R. Taylor

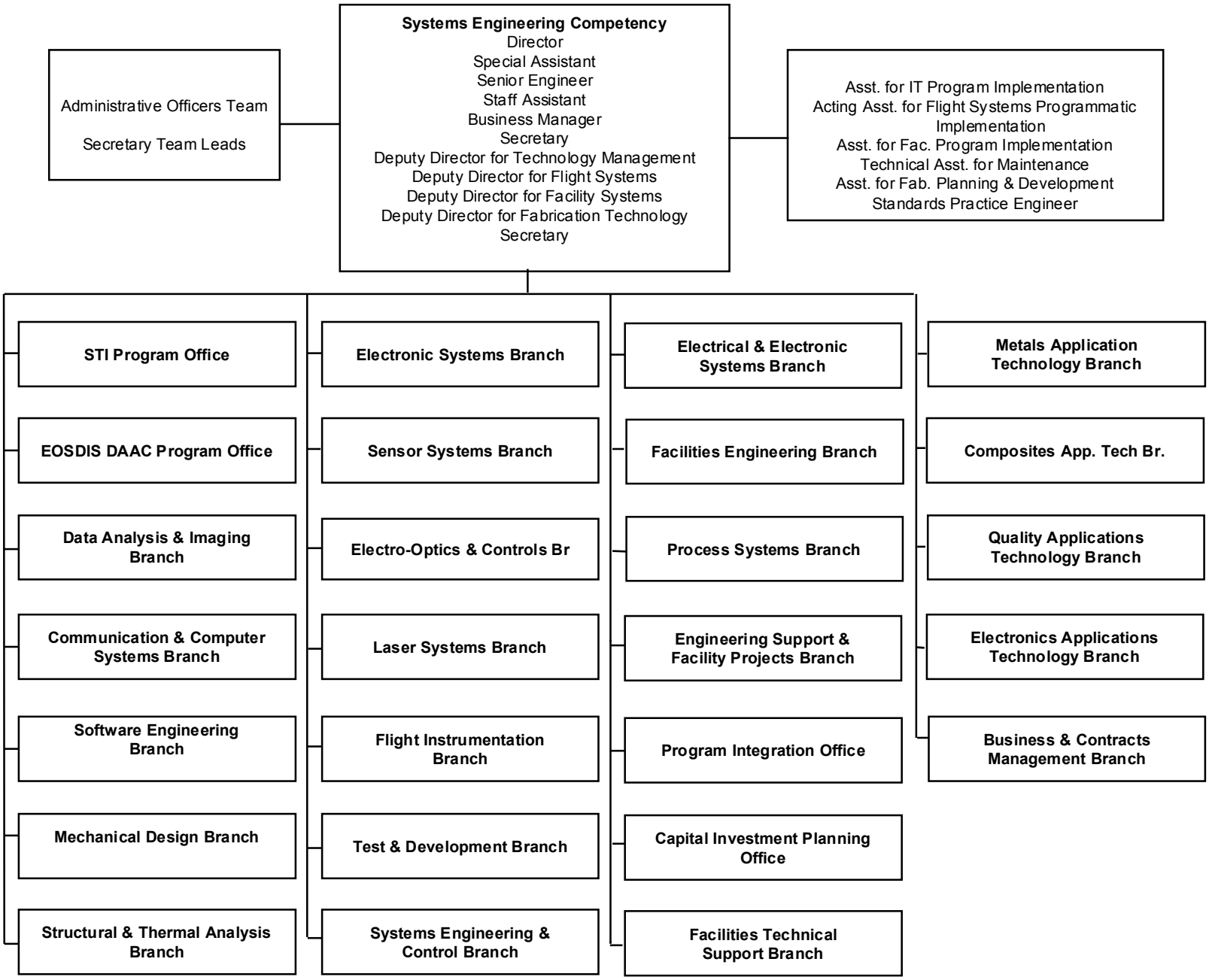
April 25, 2000



Revised 10/99

SEC Areas of Expertise

- Flight Aerospace Systems Development
- Information Technology
- Fabrication Technology Development
- Aeronautical and Space Research Facility Systems


Administrative Officers Team
Secretary Team Leads
Systems Engineering Competency
Director
Special Assistant
Senior Engineer
Staff Assistant
Business Manager
Secretary
Deputy Director for Technology Management
Deputy Director for Flight Systems
Deputy Director for Facility Systems
Deputy Director for Fabrication Technology
Secretary
Asst. for IT Program Implementation
Acting Asst. for Flight Systems Programmatic Implementation
Asst. for Fac. Program Implementation
Technical Asst. for Maintenance
Asst. for Fab. Planning & Development
Standards Practice Engineer
STI Program Office
EOSDIS DAAC Program Office
Data Analysis & Imaging Branch
Communication & Computer Systems Branch
Software Engineering Branch
Mechanical Design Branch
Structural & Thermal Analysis Branch
Electronic Systems Branch
Sensor Systems Branch
Electro-Optics & Controls Br
Laser Systems Branch
Flight Instrumentation Branch
Test & Development Branch
Systems Engineering & Control Branch
Electrical & Electronic Systems Branch
Facilities Engineering Branch
Process Systems Branch
Engineering Support & Facility Projects Branch
Program Integration Office
Capital Investment Planning Office
Facilities Technical Support Branch
Metals Application Technology Branch
Composites App. Tech Br.
Quality Applications Technology Branch
Electronics Applications Technology Branch
Business & Contracts Management Branch

Systems Engineering Competency Program/Project Roles

- **Techology Commercialization Program**
- **Earth & Space Sciences Program Office**
  - NAST-1
  - CERES
  - SAGE III
  - EOS Algorith Dev & Ops
  - Reflected GPS
  - GEOTRACE/GIFTS
  - PICASSO CENA
  - SOLVE
  - EOSDIS DAAC
  - Cross Enterprise Sp Tech
  - Timed SABER
- **Space Access & Exploration Program Office**
  - GEOLAB
  - SEEP
  - Hyper X
  - RLV Focused Technology
  - Mars Surveyor Adv Planning

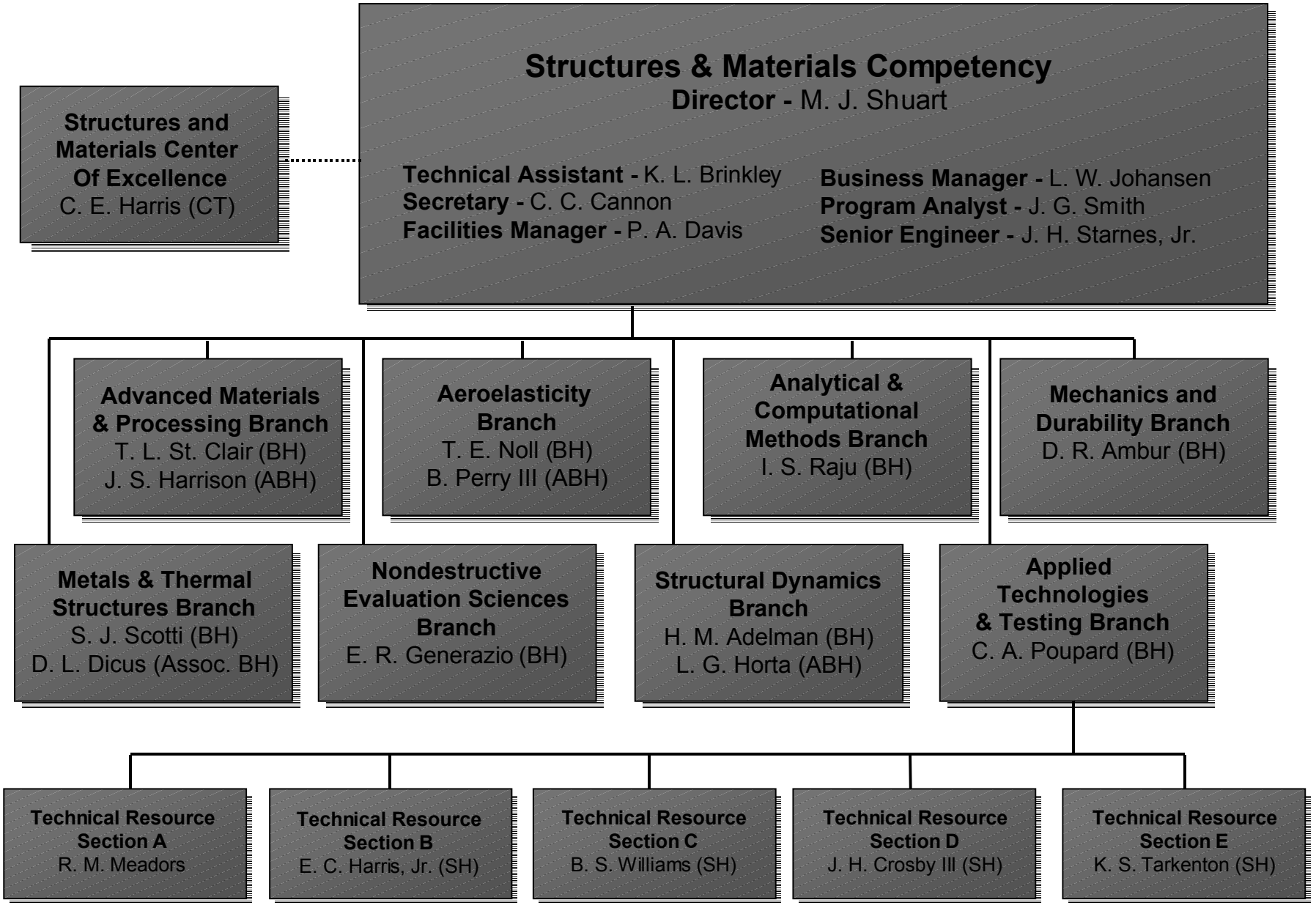
Systems Engineering Competency
Program/Project Roles

- **Aerospace Vehicle Systems Technology Program Office**
  - Aeronautics R&T Base
  - Aerospace Vehicle Systems Technology
- **Aviation Safety Program Office**
  - AFD Cockpit Development
  - Aviation Safety Technology Program
- **Intelligent Synthesis Environment Program Office**
- **Aero Performing Center Program Office**
  - Aviation System Capacity
  - Blended Wing Body
  - Integrated Information
  - R/C Aerodynamics
  - Ultra-Efficient Engine Technology
  - HPCC Computational Aerospace Science
- **Atmospheric Science**
  - Laser Research
  - Advanced Sensors
  - Software Development and Integration

Contract Role

- SAERS Supported SEC Through App. 64 Tasks

- Representative Engineering Efforts Included:
  - Mechanical Design
  - Electronic Design
  - Thermal Design & Analysis
  - Sensor System Design, Development & Operations
  - Software System Development & Test
  - Instrumentation Systems
  - Detector & Laser Development



[Chief Technologist (CT); Branch Head (BH); Assistant Branch Head (ABH); Section Head (SH)]

Areas of Expertise

AoE 1. Develop advanced **materials and processing technologies** to enable the fabrication of low-cost and high-performance structural concepts for aerospace applications.

AoE 2. Conduct research and technology development that accurately and efficiently predict **behavior, durability and damage tolerance,** evaluates **concepts, and validates** performance of advanced materials and structures for aerospace structural applications.

AoE 3. Conduct research and technology development for advanced **sensors, intelligent systems, and ground operations** to ensure structural integrity, reliability, and safety for aerospace vehicles.

AoE 4. Conduct research and technology development to quantify and control **aeroelastic response, unsteady aerodynamic** flow phenomena, **and structural dynamics** behavior for aerospace vehicles

Areas of Expertise (cont.)

AoE 5. Design and conduct innovative structures and materials **experiments** to identify unique phenomena, interrogate new theories, and quantify material and structural behavior **using complex research facilities and equipment safely** .

AoE 6. **Lead, manage**, and provide administrative support to the organization, facilities, and programs.

Structures & Materials Capabilities

From Materials Synthesis to Large Structures Testing

Polymer Synthesis

Materials Characterzation

Structural Concepts Tests

Optical Fiber Draw Tower

Transonic Dynamics Tunnel

Landing Dynamics Test

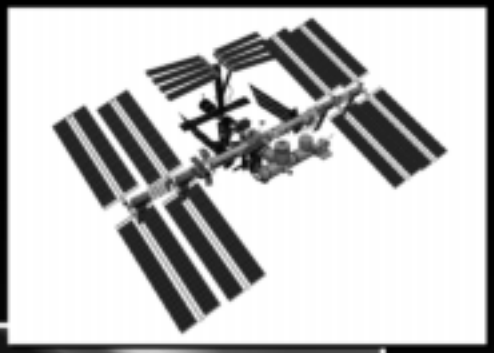
S&M Facilities

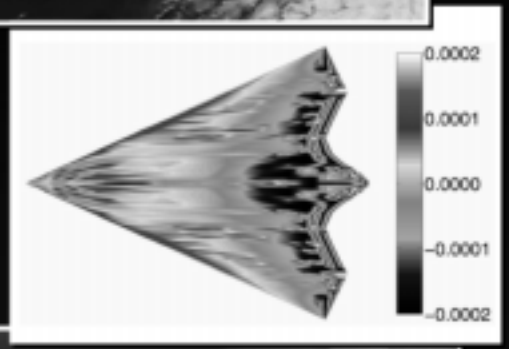
Aerospace Systems, Concepts and Analysis Competency

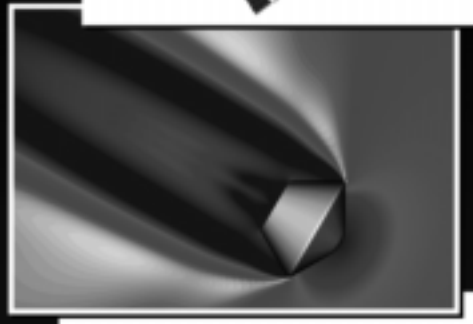
From the Runway to the Planets...

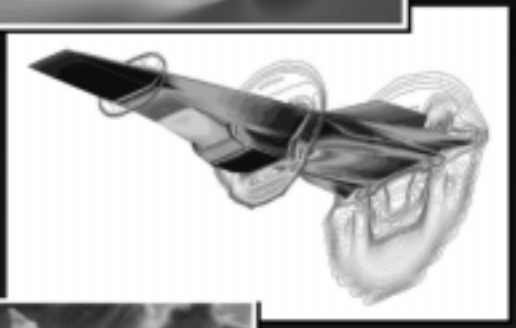
Improving Quality of Life and Enabling Exploration

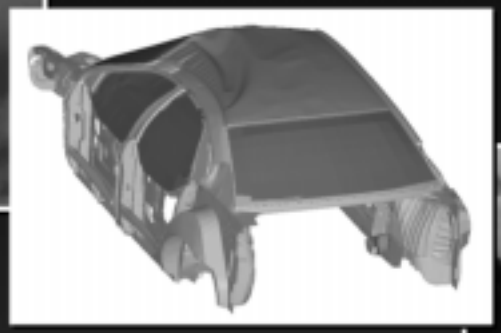
- *Technology Payoff*
- *Lower Cost*
- *Safety*
- *Environment*
- *Performance*









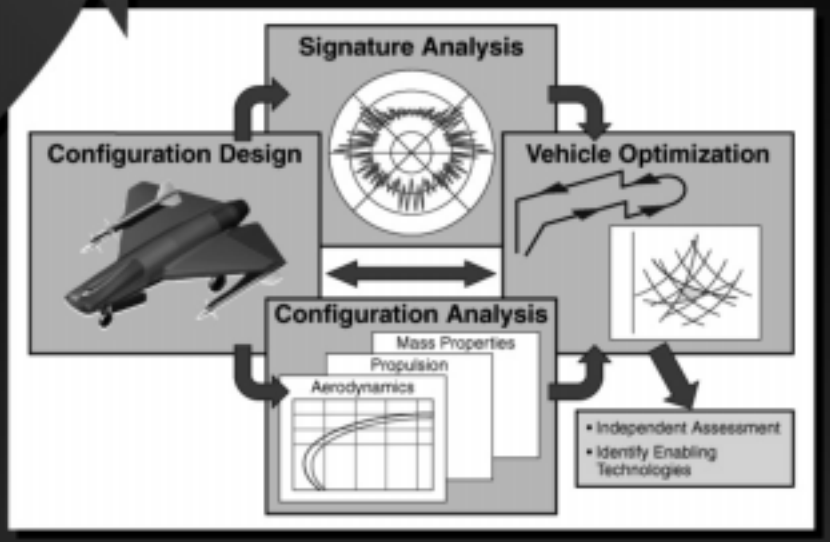


Advancing the State-of-the Art for Survivable Systems

Research and Develop New Technologies
(e.g. unmanned, high-g fighter aircraft)

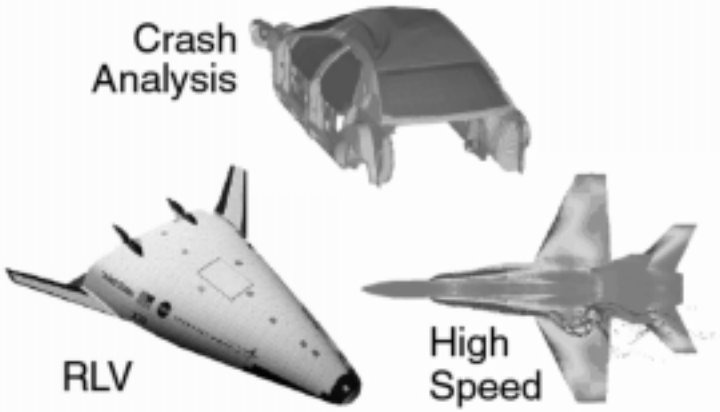
Survivability Challenges
(e.g. air-to-air superiority)

Evaluation of Technologies



Computational Aerosciences

Complex MDO Applications



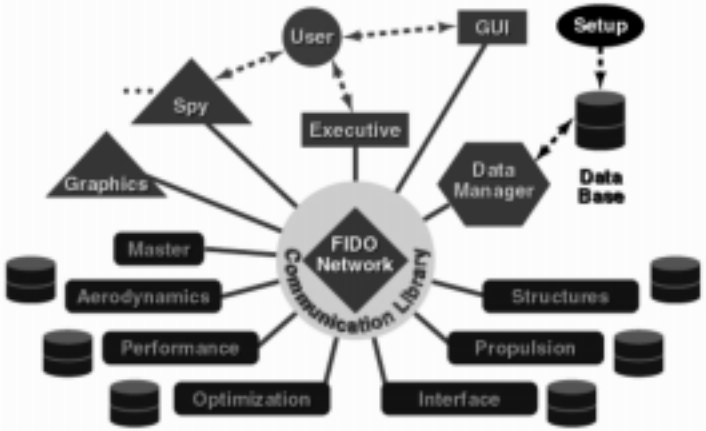
Basic Research/System Software

Learning Technologies

Educational technology to develop future scientists and engineers skilled in high performance computing

Computational Frameworks

FIDO Execution System



Advanced Methods

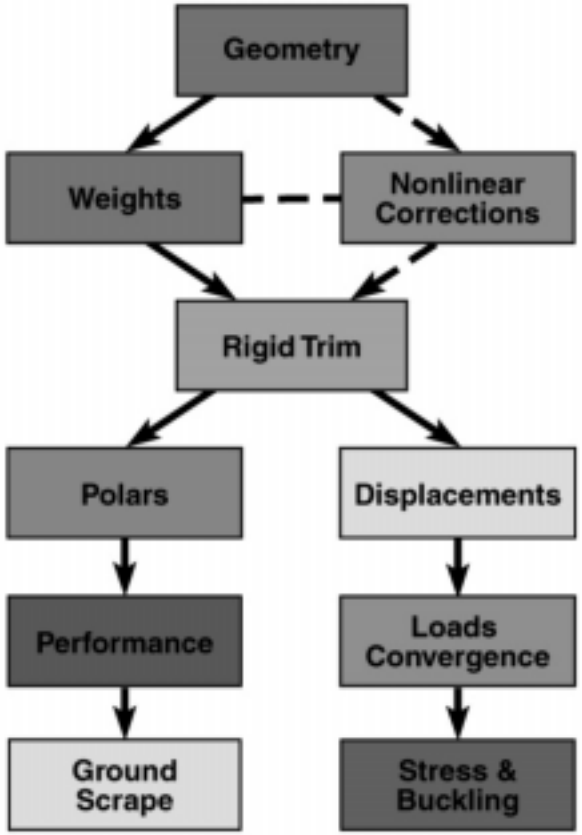
"Compute as fast as engineers can think."

Multidisciplinary Design Optimization

Charter: develop MDO methods to increase design confidence and to cut development time

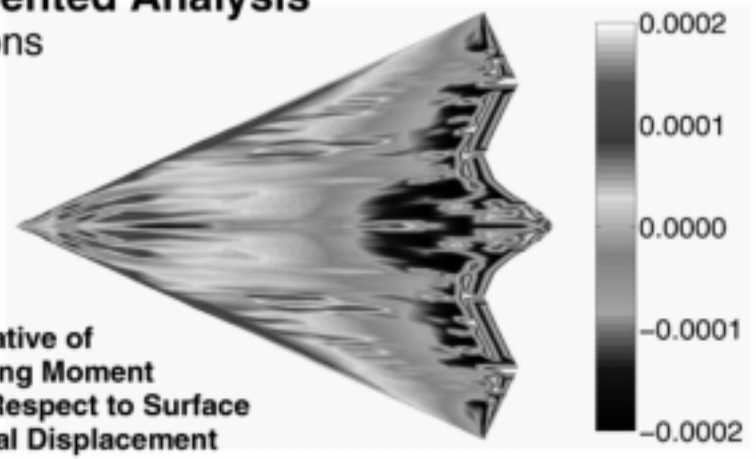
Multidisciplinary Optimization

Integration Methods
Optimization Methods



Design-Oriented Analysis

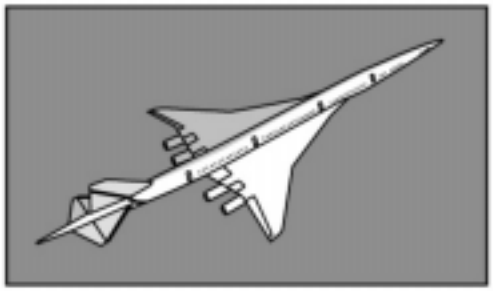
Approximations
Sensitivity



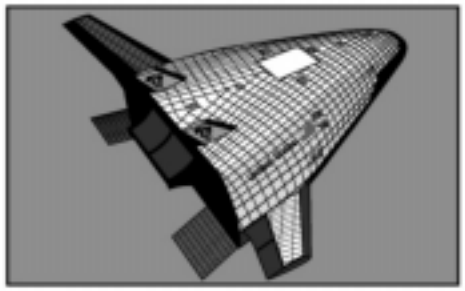
$\partial C_M/\partial z$: Derivative of Pitching Moment with Respect to Surface Normal Displacement

High-Fidelity Applications

Aeronautics

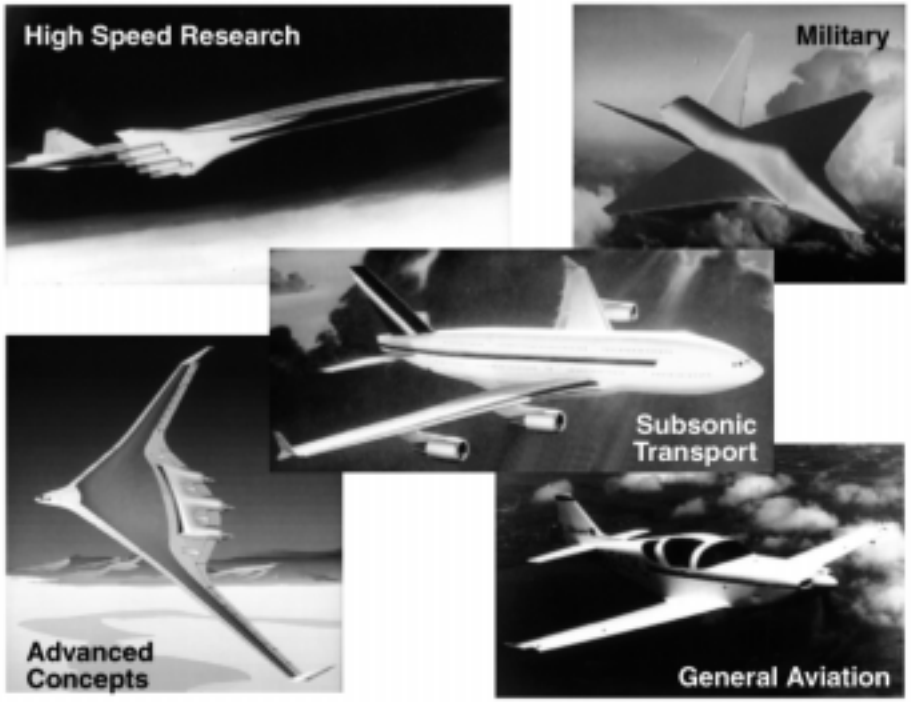


Space



Advanced Civil Airplane & Transportation Systems Analysis

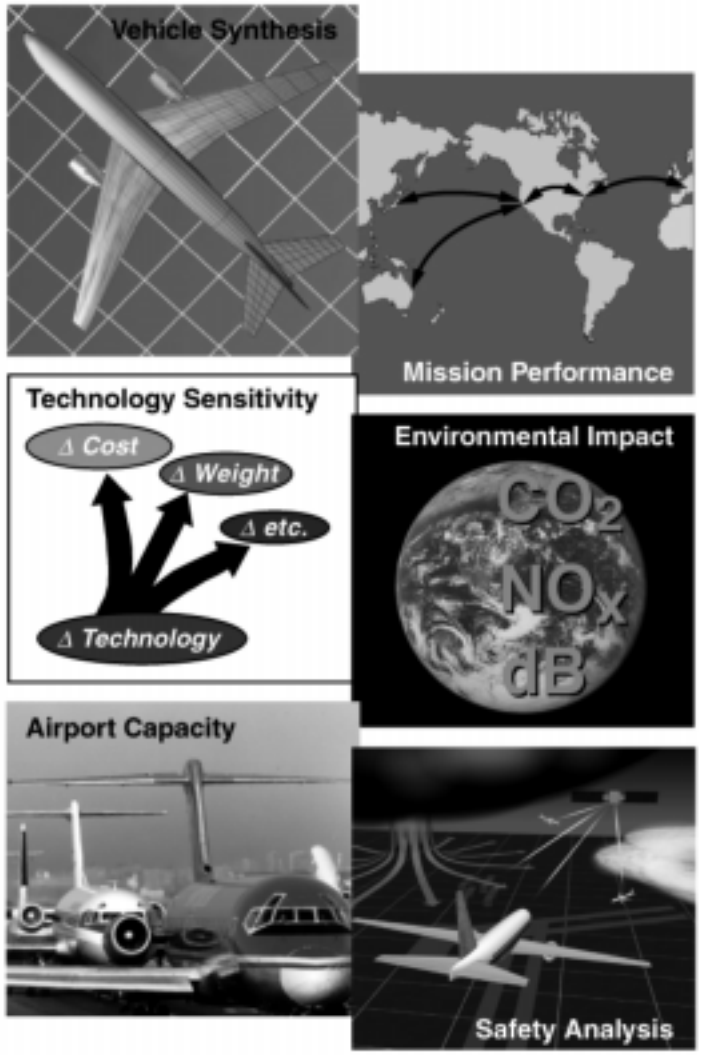
Aircraft Systems Analysis



Aeronautics Systems Analysis Tools

Aircraft Synthesis and Optimization (FLOPS)/(ACSYNT)
Aviation System Analysis Capability (ASAC)
Aircraft Life Cycle Cost Analysis (ALCCA)
NASA Cost Benefit Analysis (NACBA) Tool

Transportation Systems Analysis



Space Mission Analysis

Advanced
Systems
Software
Development

GRACE

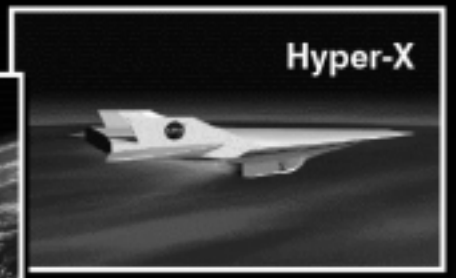
GPS Ocean
Bounce

International
Space Station
Evolution and HEDS
Systems Analysis

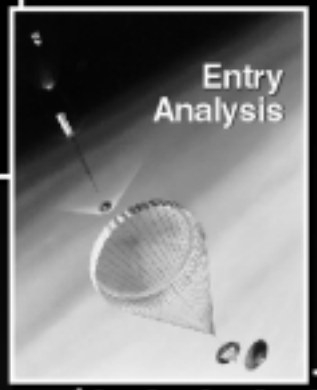
RLV Crew &
Logistics Carriers
for the ISS

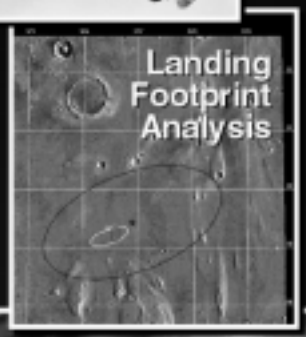
Vehicle Analysis

Space Transportation



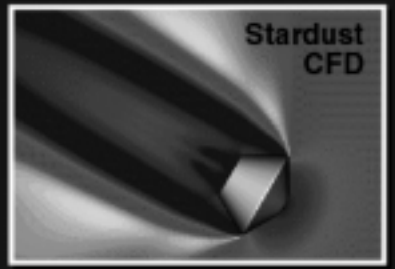
Planetary Exploration





- *Define and assess advanced system concepts*
- *Assess technologies/identify technology requirements*
- *Design, validate, and assess flight systems*
- *Develop analysis tools and methods*

Analysis Capability Development



HYPERSONIC AIRBREATHING SYSTEMS

presented by

Charles R. McClinton
Technology Manager
Hyper-X Program Office

to the

Systems Analysis and Mission Support
(SAMS)
Pre-Proposal Conference
April 25, 2000
NASA Langley Research Center

HYPERSONIC AIRBREATHING SYSTEMS

Objective:
Develop world-class hypersonic technology

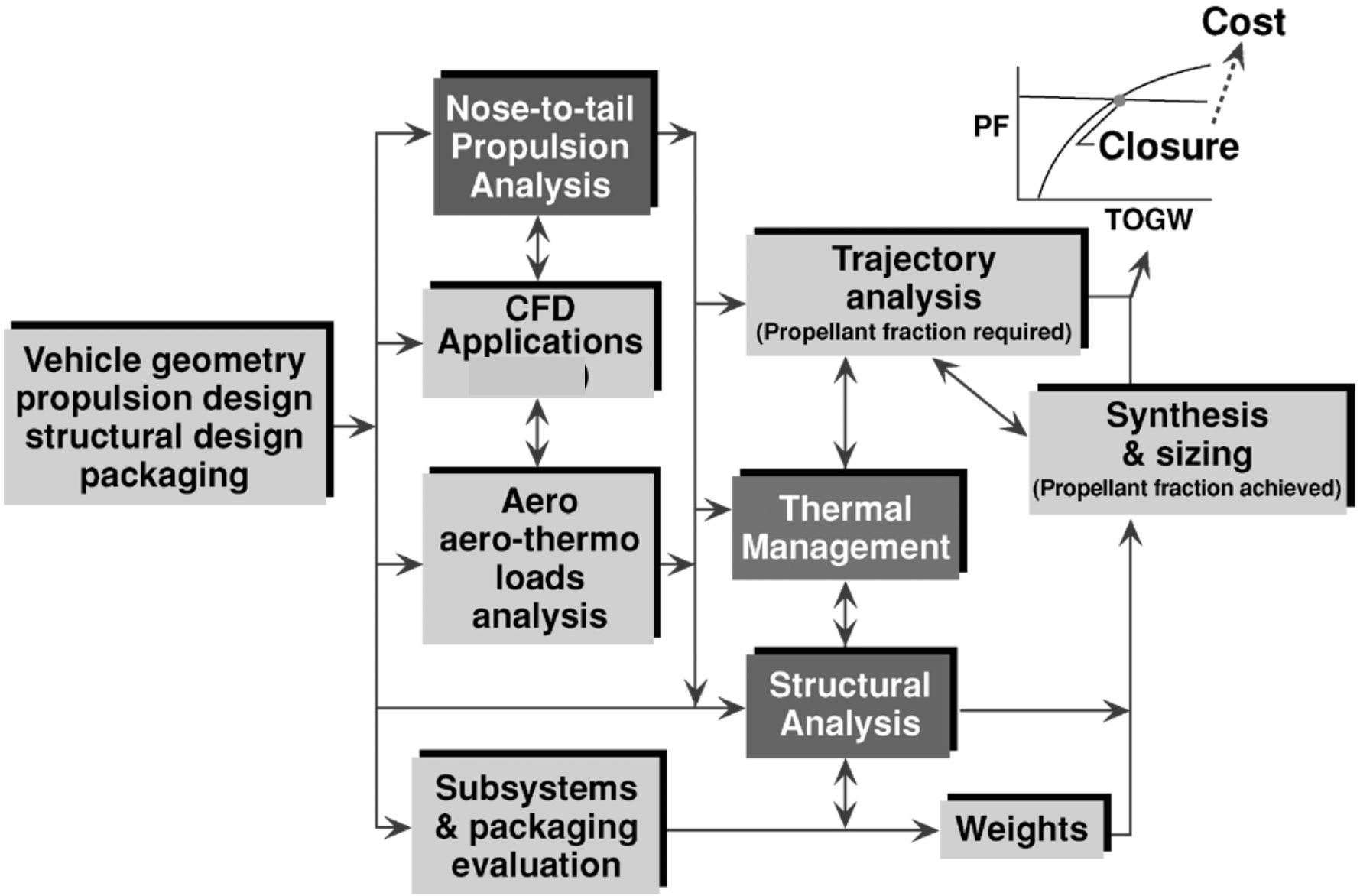
- Integrated hypersonic airbreathing systems analysis, design and evaluation
- Scramjet flowpath and engine analysis and design
- Method development and validation
- CFD applications

HYPERSONIC AIRBREATHING SYSTEMS

Focus

- **Hyper-X (LaRC)**
  - X-43 design
  - Flight test risk reduction
  - Methods validation
  - Follow on flight test vehicle design
- **Spaceliner (MSFC)**
  - Vision vehicle design
  - RBCC (Rocket based combined cycle) and
  - TBCC (turbine based c_ c_) engine technology
  - Flight test vehicle(s) conceptual design

VEHICLE DESIGN / ANALYSIS PROCESS



VISION VEHICLE FIDELITY

Color Code	Propulsion	Aero	Structure Weight	Vehicle Performance	Synthesis & Packaging
Blue	Flight Data	Flight Data	Flight Vehicle	Flight Vehicle Performance	Flight Vehicle
Light Blue	Wind Tunnel Data	Wind Tunnel Data	Components Fab/Test	6-DOF Hardware Simulation	Mock-up, CAD Multi-Eqn. Non-linear
Green	CFD Certified	CFD Certified	FEM Certified	3-DOF/ 6 DOF Trimmed	CAD Multi-Eqn. Non-linear
Light Green	Cycle Certified	Engineering Methods Certified	Unit Loads Certified	3-DOF Trimmed	CAD Multi-Eqn Non-Linear
Yellow	CFD Uncertified	CFD Uncertified	FEM Uncertified	3-DOF untrimmed	Single Eqn., Non-linear
Light Yellow	Cycle Uncertified	Engineering Methods Uncertified	Unit Loads Uncertified	Energy State	Single Eqn. Linear
Red	Ideal Cycle	L/D, Cd Estimated	Design Tables	Rocket Equation	Estimated

HYPER-X PROGRAM GOAL AND OBJECTIVES

Goal

– Demonstrate and validate the technology, experimental techniques, and computational methods and tools for design and performance predictions of a hypersonic aircraft with an airframe-integrated dual-mode scramjet

Objectives

– First ever free-flight demonstration of an airframe-integrated scramjet

– Verification of computational predictions, analysis and ground test methodologies

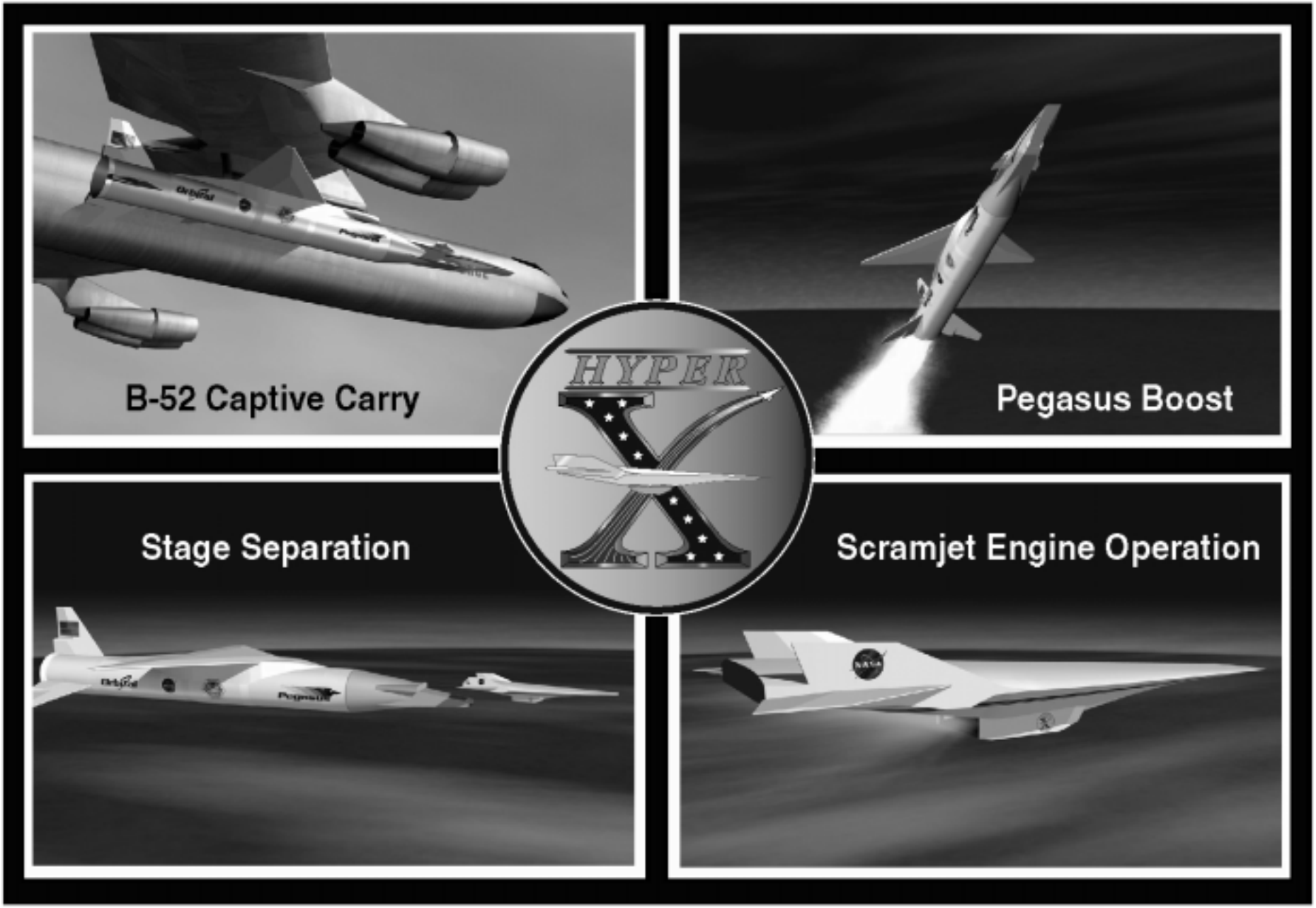
– Scaling of design concepts to future operational air-breathing hypersonic cruise and space access vehicles

Approach: Two-phase, flight-focused program

– Phase I: airframe-integrated, dual-mode scramjet
  - Three 12-foot, autonomous, expendable test vehicles
  - Two Mach-7 flights, one Mach-10 flight

– Phase II builds on Phase I results: a larger-scale, reusable X-plane
  - Airframe-integrated, combined-cycle propulsion
  - Flight envelope expansion from takeoff through hypersonic speeds

HYPER-X RESEARCH VEHICLE KEY MISSION EVENTS



I/HXRV MSSN EVNTS/McClinton

HYPER-X: Design[1]

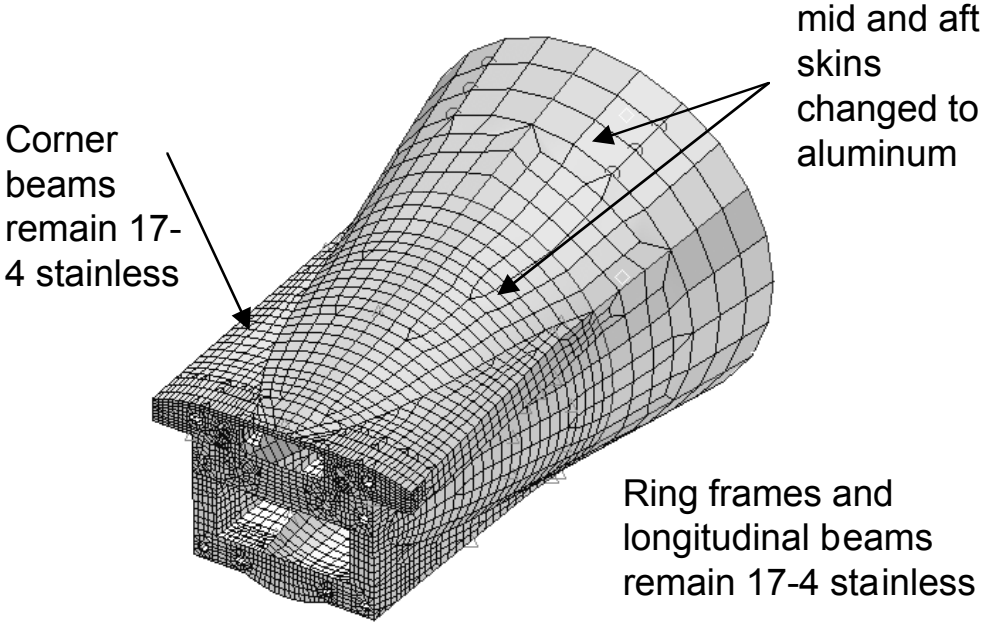
SAERS Contractor Deliverables

- Engine preliminary structural design
- Aerodynamic and aerothermal database
- Aero loads
- NASTRAN and PATRAN models
- Stage separation models
- Trajectories
- CFD analysis

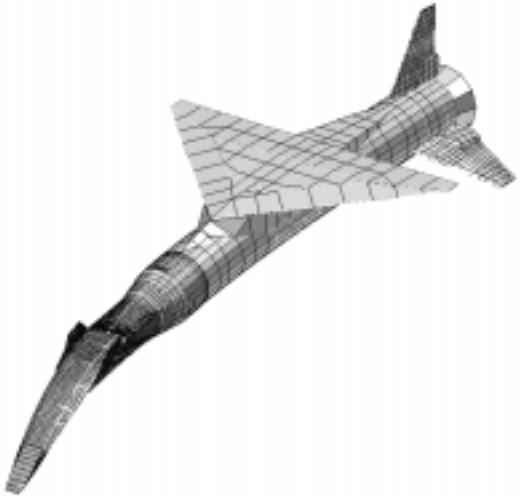
[1] Expect Mach 10 vehicle design completion in CY00

MACH 10 ADAPTER WEIGHT REDUCTION STUDY

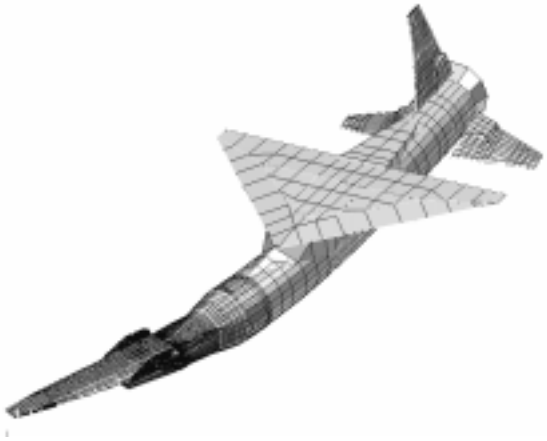
Modifications to Mid and Aft Section Skins



HXLV First Pitch Bending Mode



HXLV First Yaw Bending Mode



: HXLV Bending Frequencies for Finite Element Models

Model	Pitch Bending Frequency (Hz.)	Yaw Bending Frequency (Hz.)
Mach 7 HXLV	8.375	9.33
Mach 10 HXLV Model 1	8.74	9.73
Mach 10 HXLV Model 2	8.47	9.31

Model 1: system updates and geometry changes; no material changes (78 lb. weight reduction)

Model 2: system, geometry, and material changes (407 lb. weight reduction)

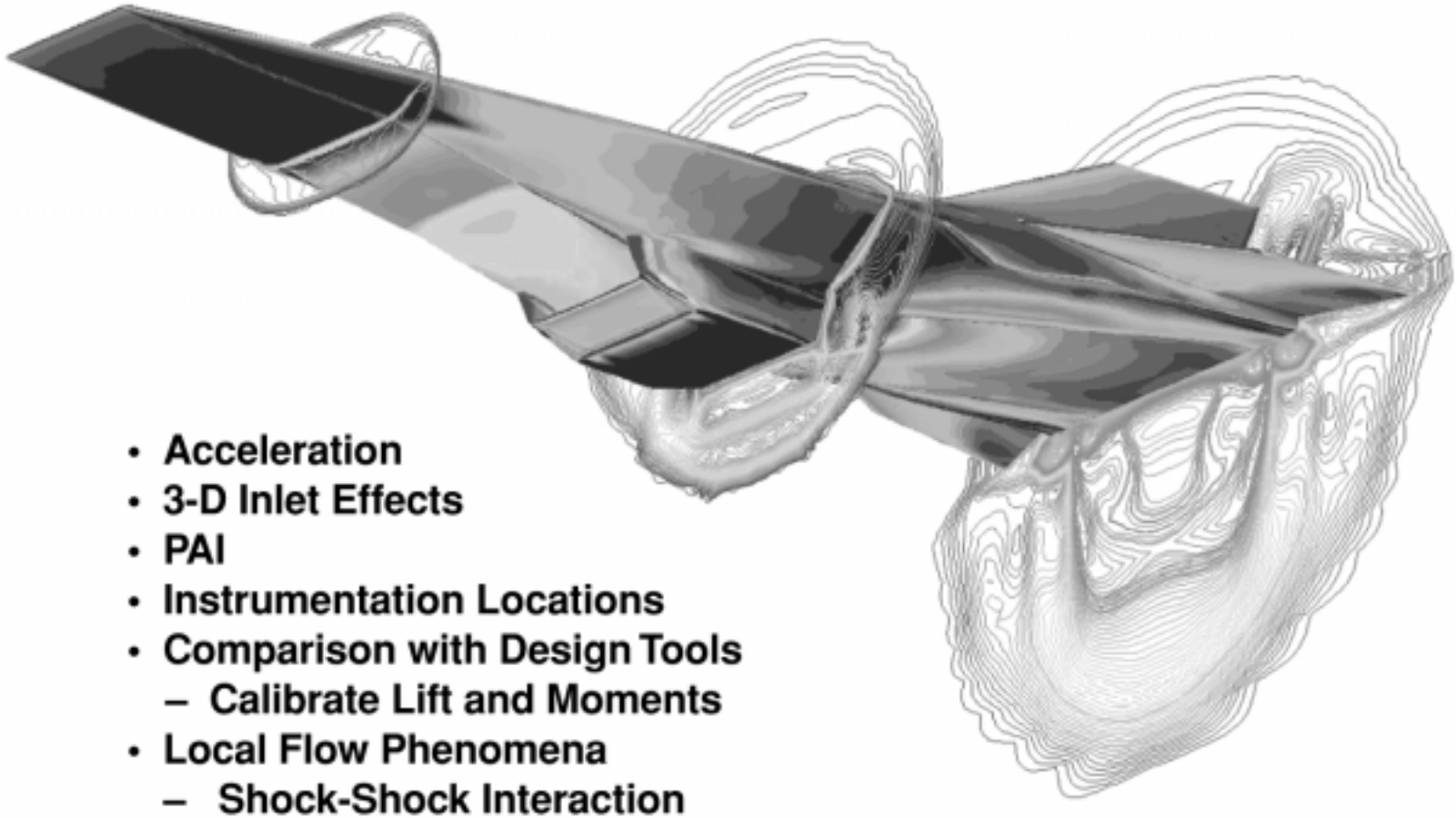
HYPER-X: Risk Reduction[1]

- **Wind tunnel data analysis/flight scaling**
  - Propulsion tests
  - Aero/aerothermal tests
  - Structural
- **Structural analysis**
- **Trajectory (Monte Carlo) analysis**
- **Detailed CFD analysis**
  - 3-D, finite rate chemical kinetics
  - Internal and external flows

[1] Mach 7 and 10 risk reduction continuing in FY 01-02.

OVERALL PERFORMANCE AND FLOW DETAILS BY GASP FNS ANALYSIS

Hyper-X Mach 7 Powered CFD Solution



- Acceleration
- 3-D Inlet Effects
- PAI
- Instrumentation Locations
- Comparison with Design Tools
  - Calibrate Lift and Moments
- Local Flow Phenomena
  - Shock-Shock Interaction
  - Base Pressure, Drag, Heating

HYPER-X: Methods Validation with Flight Data[1]

- Scramjet performance
- Structural and thermal
- Aerodynamic and aerothermal
- Aerodynamic loads
- Trajectory and stage separation simulation

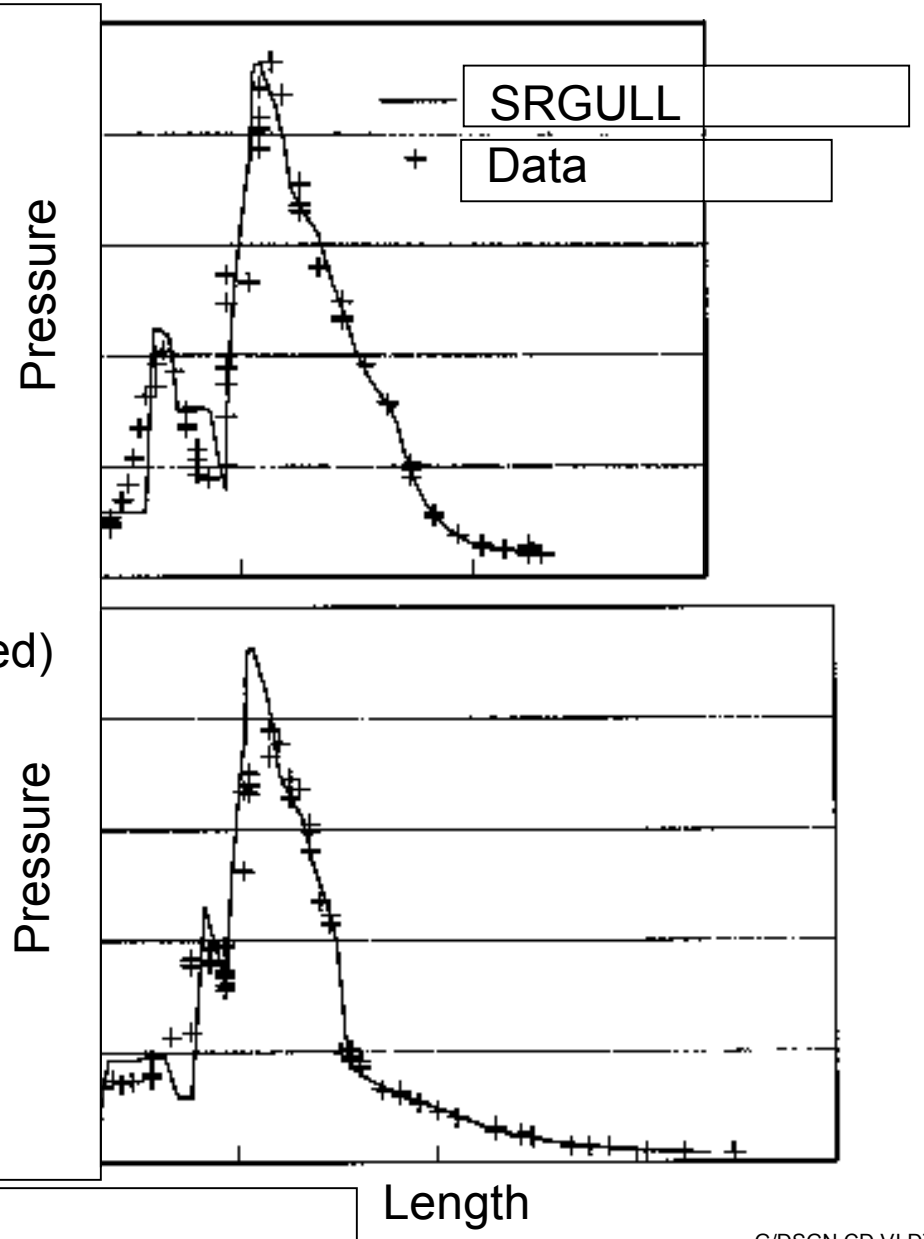
[1] Methods validation continuing in FY 01-02.

HXFE / VFS IN THE 8-FT. HTT

DESIGN CODE VALIDATION TO HYPER-X MACH 7 ENGINE DATA

- Mach 7 high power condition
- Predicted forces validated
  - Thrust
  - Lift
  - Pitching moment

  (Yaw moments being developed)
- Predicted loads validated
  - Pressure
  - Heat transfer



HYPER-X: Follow on Flight Test Vehicle Design and Technology[1]

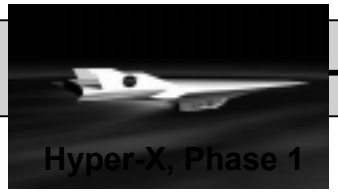
- Efficient flight test vehicle design
- Hypervelocity scramjet technology
- Turbine-based combination engine design
- Alternate propulsion cycles
- Weakly ionized gas effects
- Improved design methods
- Etc.

[1] Continuing in FY 01-02.

HYPERSONIC TECHNOLOGY DEVELOPMENT PLAN

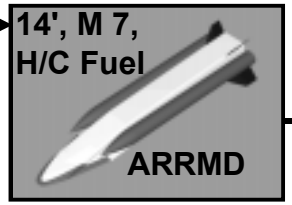
FY 96 FY 02 FY 07 FY 14

AFRL HyTech Program: H/C scramjets engines
(endothermic fuels, structures, systems)



30'; Reusable, M 4 - 7

14', M 7,
H/C Fuel



DAR PA/USAF

12'; M<<1

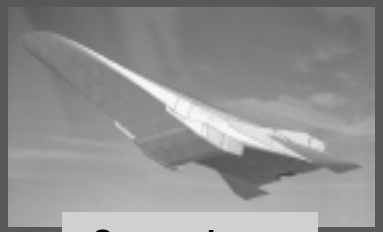
HyFLYTE RPV

X-33 Gr/Epox
X-37 Gr/Poly
LaRC IMI

45'; Reusable, M 0 – 7

Hyper-X, Phase 2

Airplanes



Spaceplanes

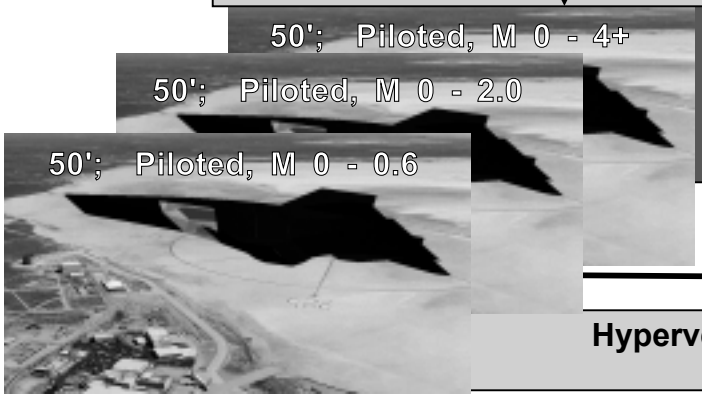
Prototype Vehicles

Revolutionary Turbine Based Engine (RTBE)
(GRC, LaRC, USN, MSFC, DFRC)

Generation 2

Generation 3

Turboramjet Scramjet Combination Engine



HLD

Hypervelocity scramjet, structures, WIG, boundary layer transition, etc.
(U.S. Army, NASA LaRC)

E C N NEW	E C N OLD	DESCRIPTION MANUFACTURER	SERIAL NO MODEL NO	ACQ DOC ACQ DATE	BLDG ROOM	ACQ COST
1259402		MOCK-UP, WING GLOVE NATIONAL AERONAUTICS AND SPACE	NONE (VERIFIED) NONE (VERIFIED)	MISC-AMES 94/01/03	582 TUNN	27,488
1742563		COMPUTER, MICRO GATEWAY 2000	6993609 BATC	L 5864 97/04/24	645A 200	2,483
1259320		DISPLAY UNIT NANAO-USA	54789083 MA2170	L 40856D 93/12/30	646 0.203	2,775
804032		DISPLAY UNIT APPLE COMPUTER INC	S44311S8 M1823	NAS 1 20005 94/09/22	1146 129	1,866
1741942		COMPUTER, MICRO POWER COMPUTING CORP	1387589 604/150	NAS 1 20004 97/02/20	1146 129	2,305
1741959		DISPLAY UNIT HITACHI MFG CO	T6L003848 CM2011MU-RO	NAS 1 20004 97/02/20	1146 129	1,416
1882728		COMPUTER, MICRO DELL COMPUTER CORP F-PC'S LTD	431ZM MMS	B RBJ/0000 99/09/10	1146 129	2,067
1883260		COMPUTER, MICRO APPLE COMPUTER INC	XA9422W5HE5 M5183	B RBJ/0000 99/10/25	1146 129	2,259
53656		CABINET, FILE, SECURITY MOSLER SAFE CO	2571467 NONE	L 31566C 88/03/14	1146 204	2,089
1156716		PRINTER, ADP HEWLETT-PACKARD CO	3128JG3RKL 33481A	L 21043D 92/09/15	1148 202	983
1876566		COMPUTER, MICRO DELL COMPUTER CORP F-PC'S LTD	BZG1P MMS	B ZCRD0721 98/03/23	1148 202	1,900
1879104		COMPUTER, MICRO NETWORK COMPUTING DEVICES INC	0998Z004220 EXPLORA701	L 8312 98/09/15	1148 202	2,011
1879106		COMPUTER, MICRO NETWORK COMPUTING DEVICES INC	0998Z004222 EXPLORA701	L 8312 98/09/15	1148 202	2,011
1879107		COMPUTER, MICRO	0998Z004225	L 8312	1148	2,011

	NETWORK COMPUTING DEVICES INC	EXPLORA701	98/09/15	202		
1879137	DISPLAY UNIT NETWORK COMPUTING DEVICES INC	G8A002350 NC995AA	L 8312 98/09/15	1148 202		500
1879138	DISPLAY UNIT NETWORK COMPUTING DEVICES INC	G8A002342 NC995AA	L 8312 98/09/15	1148 202		500
1879139	DISPLAY UNIT NETWORK COMPUTING DEVICES INC	G8A002343 NC995AA	L 8312 98/09/15	1148 202		500
1879435	COMPUTER, MICRO APPLE COMPUTER INC	SG8361MYDL4 M3979	NAS 1 20004 98/09/29	1148 210		1,795
1741168	COMPUTER, MICRO GATEWAY 2000	6421653 ATX TOWER	L 5252 97/01/22	1168 119		4,251
1881851	COMPUTER, MICRO APPLE COMPUTER INC	SG912KGAG9D M5183	B ZCRD0553 99/07/07	1192C 142		1,629
1259321	COMPUTER, MICRO GATEWAY 2000	1831558 NEW TOWER	L 40856D 93/12/30	1192C 158		2,495
1092831	DISK DRIVE UNIT JMR ELECTRONICS INC	92140049 MZF0-001	L 11985D 92/05/18	1192D 123		1,972
549630	TERMINAL, DATA PROCESSING DIGITAL EQUIPMENT CORP	AB34600CK3 VT240A	L 65438B 84/05/22	1192E 105B		1,424
1259394	COMPUTER, MINI SILICON GRAPHICS INC	08006907C7C76E CMNB007	NAS 1 20003 94/01/06	1192E .109A		40,985
1262007	DISK DRIVE UNIT KINGSTON TECHNOLOGY CORP	94660 DS100SF	L 49087D 94/05/18	1192E .109A		2,250
1877922	DISPLAY UNIT SONY CORP	203J968 GDM20E21	NAS 1 20003 98/06/15	1192E .109A		1,800
1255310	SPECTROMETER PERKIN-ELMER CORP THE	35638 LS50B	L 35253D 93/07/23	1200 106		43,806
1263297	COMPUTER, MICRO GATEWAY 2000	3345569 BABY AT	L 52786D 94/08/16	1200 106		2,459

1263298	DISPLAY UNIT GATEWAY 2000	MH1934121951 CS17762LE-G	L 52786D 94/08/16	1200 106	500
1884143	COMPUTER, MICRO INTERLINK	NONE (VERIFIED) NONE (VERIFIED)	B ZCRD1254 00/02/16	1200 109	1,058
549327	GRINDING MILL/MIXER, LABORATRY SPEX INDUSTRIES INC	84071 8000	L 68057B 84/06/04	1200 112	1,200
1423610	COMPUTER, MICRO COMPAQ COMPUTER CORP	9310HDL63620 2810E	L 24386D 93/05/03	1202 106	4,834
283421	MICROSCOPE NIKON INC	32633 SMZ10	L 88748B 85/07/31	1202 106A	1,273
37437	BALANCE, ANALYTICAL DENVER INSTRUMENT INC	NONE (VERIFIED) 100A	B DIH1252 96/09/23	1202 107	1,164
54121	SYSTEM, DATA ACQUISITION KEITHLEY INSTRUMENTS INC	385227 500-500	L 32846C 88/02/26	1202 107	5,090
283420	CONTROL, CAMERA, MICROSCOPE NIKON INC	341090 AFXII	L 88748B 85/07/31	1202 107	1,596
283422	TRINOCULAR HEAD NIKON INC	76130 SNZ10	L 88748B 85/07/31	1202 107	1,062
1878134	SCANNER, THERMOCOUPLE MEASUREMENTS GROUP INC THE	131016 5100	L 68207D 98/07/07	1205 129	2,255
1881977	CRYOPROCESSOR 300 BELOW INC	701-0029 701	L 9664 99/07/20	1205 129	24,800
1422577	DISPLAY UNIT VIEWSONICS INC	J243210460 1782-2	NAS 1 20006 94/10/19	1208 117A	887
1875211	DISPLAY UNIT KDS	1172005186 VS19	B ZCRD0528 00/02/09	1208 117A	659
1879172	COMPUTER, MICRO 3D GAMING AND COMPUTING	NONE (VERIFIED) NONE (VERIFIED)	B ZCRD0528 98/09/18	1208 117A	1,666
846492	COMPUTER, MICRO APPLE COMPUTER INC	F9259S2 M5650	L 59475C 89/07/24	1208 306	4,666

1159609	DISPLAY UNIT SONY CORP	SG240HCUE04 M1212	NAS 1 19468 93/02/10	1208 306	662
1882725	COMPUTER, MICRO LYNNHAVEN CUSTOM COMPUTER	NONE (VERIFIED) NONE (VERIFIED)	B RBE/0000 99/09/10	1208A 105	2,131
1260520	DISPLAY UNIT RADIUS INC	SSG351A10800 381	L 44105D 94/02/14	1208A 107	2,241
1742913	DISK DRIVE UNIT PINNACLE MICRO INC	485020411 VERTEX2.6GB	B DFC3367 97/08/21	1208A 107	1,395
846119	DISPLAY UNIT DIGITAL EQUIPMENT CORP	FF57328 VR290DA	L 53862C 89/06/22	1208A 111	1,600
1159510	DISK DRIVE UNIT TOTAL TEC SYSTEMS INC	14315 H212D	L 26540D 93/01/25	1208A 111	3,843
1159874	TRANSPORT, MAGNETIC TAPE WANGDAT TECHNOLOGY INC	3410105 1300	FOS 93/03/22	1208A 111	1,500
1160045	COMPUTER, MICRO DIGITAL EQUIPMENT CORP	AB3040614U VS49K-CD	NAS 1 19724 93/02/17	1208A 111	10,473
1160046	DISPLAY UNIT SONY CORP	IS24652230 GDM1961	NAS 1 19724 93/02/12	1208A 111	5,000
1256595	DISK DRIVE UNIT DIGITAL EQUIPMENT CORP	4A30402073 RWZ01AA	L 28706D 93/07/26	1208A 111	4,560
G078802	DISPLAY UNIT NEC INFORMATION SYSTEMS INC	07N01163M JC1404HMA	L 84107C 90/10/15	1208A 121	610
G078242	DISK DRIVE UNIT MOUNTAINGATE DATA SYSTEMS INC	C91753 MDB-DS2CAN-SC76	L 84250C 90/11/05	1212 202	3,755
1083703	DISK DRIVE UNIT MOUNTAINGATE DATA SYSTEMS INC	C95817 MDB-DS2CAN-SC	L 87152C 91/02/01	1212 202	2,350
1083704	DISK DRIVE UNIT MOUNTAINGATE DATA SYSTEMS INC	C95817 MDB-DS2CAN-SC	L 87152C 91/02/01	1212 202	2,350

1084108	DISK DRIVE UNIT MOUNTAINGATE DATA SYSTEMS INC	C94874 MDB-DS2CAN-SC	L 87152C 91/02/12	1212 202	2,350
1084109	DISK DRIVE UNIT MOUNTAINGATE DATA SYSTEMS INC	C94877 MDB-DS2CAN-SC	L 87152C 91/02/12	1212 202	2,350
1084143	DISK DRIVE UNIT MOUNTAINGATE DATA SYSTEMS INC	C95820 MDB-DS2CAN-SC	L 87460C 91/02/15	1212 202	2,350
1084144	DISK DRIVE UNIT MOUNTAINGATE DATA SYSTEMS INC	C95826 MDB-DS2CAN-SC	L 87460C 91/02/15	1212 202	2,350
1084145	DISK DRIVE UNIT MOUNTAINGATE DATA SYSTEMS INC	C95828 MDB-DS2CAN-SC	L 87460C 91/02/15	1212 202	2,350
1086962	DISK DRIVE UNIT MOUNTAINGATE DATA SYSTEMS INC	100974 MDB-DS2CAN	L 95989C 91/07/23	1212 202	2,350
1087471	DISK DRIVE UNIT MOUNTAINGATE DATA SYSTEMS INC	100977 DS2CAN-P-SCSI	L 92833C 91/08/20	1212 202	3,045
1087472	DISK DRIVE UNIT MOUNTAINGATE DATA SYSTEMS INC	101005 DS2CAN-P-SCSI	L 92833C 91/08/20	1212 202	3,045
G078859	PROCESSOR, SIGNAL, MODULE MACRODYNE INC	1090-013 3100	NAS 1 19233 90/10/22	1212 210	14,950
G078860	PROCESSOR, SIGNAL, MODULE MACRODYNE INC	1090-014 3100	NAS 1 19233 90/10/22	1212 210	14,950
G078861	PROCESSOR, SIGNAL, MODULE MACRODYNE INC	1090-015 3100	NAS 1 19233 90/10/22	1212 210	14,950
G078862	POWER SUPPLY MACRODYNE INC	1090-082 3000	NAS 1 19233 90/10/22	1212 210	1,140
G078863	POWER SUPPLY MACRODYNE INC	1090-083 3000	NAS 1 19233 90/10/22	1212 210	1,140
G078864	GENERATOR, WAVEFORM,	1090-008	NAS 1 19233	1212	4,600

	MODULE MACRODYNE INC	3005	90/10/22	210		
1158086	CARD CAGE MACRODYNE INC	193-023 3030	L 26353D 93/01/20	1212 210		20,680
1612822	DISK DRIVE UNIT SMART AND FRIENDLY INC	00333-008126 CD-RW426	B DAA/0000 98/11/03	1212 210		599
1873485	COMPUTER, MICRO COMPAQ COMPUTER CORP	6720HVWP015 DESKPRO2000	L 6185 97/07/16	1212 210		5,500
1085398	RECORDER, TAPE, ANALOG HONEYWELL INC AEROSPACE DIV	0100331AD91 97(16821992-001	NAS 1 19202 91/05/16	1212 .134A		162,216
1087470	CHASSIS, DISK DRIVE MOUNTAINGATE DATA SYSTEMS INC	100310 DS2000SP0	L 92833C 91/08/20	1212C 108		3,550
G076465	GENERATOR, TIME CODE DATUM INC F- PERIPHERAL	476 9700	L 79083C 90/08/10	1212C 108A		5,177
G078244	DISK DRIVE UNIT MOUNTAINGATE DATA SYSTEMS INC	C92926 MDB-DS2000	L 84250C 90/11/05	1212C 108A		1,685
1083702	DISK DRIVE UNIT MOUNTAINGATE DATA SYSTEMS INC	C95772 MDB-DS2000SP0	L 87152C 91/02/01	1212C 108A		3,000
1084107	DISK DRIVE UNIT MOUNTAINGATE DATA SYSTEMS INC	C73578 MDB-DS2000SP0	L 87152C 91/02/12	1212C 108A		3,000
1084140	DISK DRIVE UNIT MOUNTAINGATE DATA SYSTEMS INC	C95770 MDB-DS2000SP0	L 87460C 91/02/15	1212C 108A		3,000
1084141	DISK DRIVE UNIT MOUNTAINGATE DATA SYSTEMS INC	C95771 MDB-DS2000SP0	L 87460C 91/02/15	1212C 108A		3,000
1084142	DISK DRIVE UNIT MOUNTAINGATE DATA SYSTEMS INC	C95807 MDB-DS2CAN-SC	L 87460C 91/02/15	1212C 108A		2,350
1085787	PROCESSOR, SIGNAL, GRAPHICS ZONIC CORP	277 7000	L 82514C 91/06/06	1212C 108A		106,408

1085788	PROCESSOR, SIGNAL, GRAPHICS ZONIC CORP	276 7000	L	82515C 91/06/05	1212C 108A	113,896
1085789	CABINET, EQUIPMENT ZONIC CORP	NONE A&D	L	82515C 91/06/05	1212C 108A	2,500
1085790	PROCESSOR, SIGNAL, GRAPHICS ZONIC CORP	278 7000	L	82516C 91/06/05	1212C 108A	113,896
1085791	CABINET, EQUIPMENT ZONIC CORP	NONE A&D	L	82516C 91/06/05	1212C 108A	2,500
1086963	DISK DRIVE UNIT MOUNTAINGATE DATA SYSTEMS INC	101085 MDB-DS2CAN	L	95989C 91/07/23	1212C 108A	3,395
1086964	DISK DRIVE UNIT ANDATACO	100376 MDB-DS2000-0	L	95989C 91/07/23	1212C 108A	2,795
G078243	DISK DRIVE UNIT MOUNTAINGATE DATA SYSTEMS INC	C91754 MDB-DS2CAN-SC76	L	84250C 90/11/05	1212C 201	3,755
G074868	TABLE, OPTICAL NEWPORT/KLINGER FRMLY NEWPORT	NONE XS26	L	75930C 90/06/14	1212C 211	1,604
G079008	SCANNER/CONTROLLER GENERAL SCANNING INC	58712 CX6120	L	78625C 90/10/26	1212C 211	1,595
G079009	SCANNER/CONTROLLER GENERAL SCANNING INC	58725 CX6120	L	78625C 90/10/26	1212C 211	1,595
G079379	STAGE, TRANSLATION KLINGER SCIENTIFIC CORP	9948 TCB200.1000PP	L	80716C 90/11/26	1212C 211	10,993
G079380	STAGE, TRANSLATION KLINGER SCIENTIFIC CORP	9949 TCB200.1000PP	L	80716C 90/11/26	1212C 211	10,993
G079381	STAGE, TRANSLATION KLINGER SCIENTIFIC CORP	9945 TCB200.1000PP	L	80716C 90/11/26	1212C 211	10,993
G079382	STAGE, TRANSLATION KLINGER SCIENTIFIC CORP	9946 TCB200.1000PP	L	80716C 90/11/26	1212C 211	10,993
G079383	STAGE, TRANSLATION KLINGER SCIENTIFIC CORP	9947 TCB200.1000PP	L	80716C 90/11/26	1212C 211	10,993

G079384	STAGE, ROTATION KLINGER SCIENTIFIC CORP	9956 RT200	L 80716C 90/11/26	1212C 211	7,492
G079385	CONTROLLER, POSITIONER KLINGER SCIENTIFIC CORP	11052 MC4	L 80716C 90/11/26	1212C 211	3,789
G079386	AMPLIFIER, POWER KLINGER SCIENTIFIC CORP	011053D2 MD4	L 80716C 90/11/26	1212C 211	2,185
G079387	AMPLIFIER, POWER KLINGER SCIENTIFIC CORP	011052D4 MD4	L 80716C 90/11/26	1212C 211	3,441
G079388	CONTROLLER, SYNCHRONIZATION KLINGER SCIENTIFIC CORP	9011052SU2 SU2	L 80716C 90/11/26	1212C 211	1,860
G079389	CONTROLLER, SYNCHRONIZATION KLINGER SCIENTIFIC CORP	9011051SU2 SU2	L 80716C 90/11/26	1212C 211	1,860
G079732	CONTROLLER, POSITIONER NEWPORT/KLINGER FRMLY NEWPORT	1095 860C2	L 84141C 90/12/12	1212C 211	1,125
847203	FREQUENCY SHIFTER, LASER TSI INC F-THERMO-SYSTEMS INC	2587D 9186A9180-3A	L 60622C 89/09/13	1212C 211	8,027
1084242	STAGE, TRANSLATION KLINGER SCIENTIFIC CORP	10430 TCB200.1000	L 80716C 91/02/25	1212C 211	7,951
1084243	STAGE, TRANSLATION KLINGER SCIENTIFIC CORP	10431 TCB200.1000	L 80716C 91/02/25	1212C 211	7,952
1085397	RECORDER, TAPE, ANALOG HONEYWELL INC AEROSPACE DIV	0100330AD91 97(16821992-001	NAS 1 19202 91/05/16	1212C 211	162,216
1088631	CONTROLLER, PROGRAMMABLE NEWPORT/KLINGER FRMLY NEWPORT	1027 PMC100	L 2764D 91/10/07	1212C 211	1,170
G079598	WORKSTATION, GRAPHICS HEWLETT-PACKARD CO	3038A00398 98735X	L 82908C 90/10/22	1212C 301	20,000
53457	RECORDER, TAPE, DIGITAL HEWLETT-PACKARD CO	2730A51645 7980A	L 27100C 88/02/11	1212C 301	17,024

1083708	DISPLAY UNIT HEWLETT-PACKARD CO	2929J23809 98754A	L 88630C 91/02/04	1212C 301	7,000
1256008	COMPUTER, MINI HEWLETT-PACKARD CO	6047A80161 HP9000/433	L 82908C 90/10/22	1212C 301	42,022
1259451	DISK DRIVE UNIT HEWLETT-PACKARD CO	3141A01690 C2217T	NAS 1 19724 94/01/20	1212C 301	2,889
53437	PRINTER, ADP HEWLETT-PACKARD CO	2743A03824 2564B	L 27102C 88/02/11	1212C 0.202	9,511
258418	CARD CAGE MACRODYNE INDUSTRIES INC	386-004 3030-3	NAS 1 17992 86/04/22	1212C 0.204	8,000
G074776	LASER, ARGON-ION SPECTRA-PHYSICS	319 2040-15	NAS 1 19117 90/04/02	1212C 0.211	30,100
G075245	OSCILLOSCOPE TEKTRONIX INC	B050669 2467B	L 76382C 90/05/24	1212C 0.211	11,834
G075246	OSCILLOSCOPE TEKTRONIX INC	B050677 2467B	L 76382C 90/05/24	1212C 0.211	11,834
G079804	PUMP, WATER PULSAFEEDER, INC.	ECJ2AFACCYSS 90	L 86214C 91/01/10	1212C 0.211	1,095
20909	ROTATOR, POLARIZATION TSI INC F-THERMO-SYSTEMS INC	NONE 9102-12	L 76397C 90/07/23	1212C 0.211	1,573
20910	EXPANDER, LASER BEAM TSI INC F-THERMO-SYSTEMS INC	NONE 9189	L 76397C 90/07/23	1212C 0.211	4,205
20911	RECEIVER, OPTICAL TSI INC F-THERMO-SYSTEMS INC	NONE 9140A	L 76397C 90/07/23	1212C 0.211	2,324
20912	COUPLER, FIBER OPTICS TSI INC F-THERMO-SYSTEMS INC	NONE 9271	L 76397C 90/07/23	1212C 0.211	2,315
20913	COUPLER, FIBER OPTICS TSI INC F-THERMO-SYSTEMS INC	NONE 9271	L 76397C 90/07/23	1212C 0.211	2,315
20916	POWER SUPPLY TSI INC F-THERMO-	NONE 9165	L 76397C 90/07/23	1212C 0.211	2,200

	SYSTEMS INC				
21661	STAGE, ROTATION	759	L 2764D	1212C	1,830
	NEWPORT/KLINGER FRMLY NEWPORT	495	91/10/07	0.211	
52591	DOWNMIXER/SIGNAL SPLITTER	2396D	L 27379C	1212C	6,296
	TSI INC F-THERMO-SYSTEMS INC	9186A	87/11/03	0.211	
52592	BRAGG CELL	NONE	L 27379C	1212C	2,199
	TSI INC F-THERMO-SYSTEMS INC	9182-3A	87/11/03	0.211	
139159	PHOTOMULTIPLIER	1087L	L 14540C	1212C	3,800
	TSI INC F-THERMO-SYSTEMS INC	9162	87/03/02	0.211	
139160	PHOTOMULTIPLIER	1089L	L 14540C	1212C	3,800
	TSI INC F-THERMO-SYSTEMS INC	9162	87/03/02	0.211	
139161	POWER SUPPLY	958R	L 14540C	1212C	1,225
	TSI INC F-THERMO-SYSTEMS INC	9165	87/03/02	0.211	
139162	POWER SUPPLY	957R	L 14540C	1212C	1,225
	TSI INC F-THERMO-SYSTEMS INC	9165	87/03/02	0.211	
284770	GENERATOR, AEROSOL, PORTABLE	374	L 80114A	1212C	1,305
	PACIFIC SCIENTIFIC CO	256MODIFIED	78/05/31	0.211	
801354	RECEIVER, OPTICAL	NONE	L 10922D	1212C	2,324
	TSI INC F-THERMO-SYSTEMS INC	9140A	92/04/16	0.211	
801376	ROTATOR, POLARIZATION	1527	L 11564D	1212C	2,567
	SPECTRA-PHYSICS	310A	92/04/30	0.211	
801942	COUPLER, FIBER OPTICS	126	L 25599D	1212C	2,315
	TSI INC F-THERMO-SYSTEMS INC	9271	92/12/16	0.211	
801946	COUPLER, FIBER OPTICS	125	L 25599D	1212C	2,315
	TSI INC F-THERMO-SYSTEMS INC	9271	92/12/16	0.211	
801947	COUPLER, FIBER OPTICS	128	L 25599D	1212C	2,315

	TSI INC F-THERMO-SYSTEMS INC	9271	92/12/16	0.211		
801948	COUPLER, FIBER OPTICS TSI INC F-THERMO-SYSTEMS INC	130 9271	L 25599D 92/12/16	1212C 0.211		2,315
801949	COUPLER, FIBER OPTICS TSI INC F-THERMO-SYSTEMS INC	127 9271	L 25599D 92/12/16	1212C 0.211		2,315
1089567	ROTATOR, POLARIZATION TSI INC F-THERMO-SYSTEMS INC	NONE 9102-13	L 3410D 91/10/24	1212C 0.211		1,665
1091574	TABLE, RAIL PARKER-HANNIFIN CORP MOTION AN	911219576-01 5061151S-LN-N34	L 4295D 92/01/10	1212C 0.211		7,620
1259277	BREADBOARD, OPTICAL NEWPORT/KLINGER FRMLY NEWPORT	B-1249 XA48	L 41660D 93/12/22	1212C 0.211		4,317
53454	CABINET, EQUIPMENT HEWLETT-PACKARD CO	2036A10824 29402C	L 27102C 88/02/11	1212C 0.3		2,105
G078285	LASER, ARGON-ION SPECTRA-PHYSICS	421 2040-15	NAS 1 19210 90/10/25	1212C L-LAB		46,079
20143	FREQUENCY SHIFTER, LASER TSI INC F-THERMO-SYSTEMS INC	2452D 9186A	L 34448C 88/06/13	1212C LASLB		8,027
20487	ILLUMINATOR, LASER FIBER NEWPORT/KLINGER FRMLY NEWPORT	NONE FLFI45	L 84141C 90/11/21	1212C LASLB		1,763
21260	ILLUMINATOR, LASER FIBER NEWPORT/KLINGER FRMLY NEWPORT	NONE F-LFI	L 85844C 90/12/03	1212C LASLB		1,763
801355	RECEIVER, OPTICAL TSI INC F-THERMO-SYSTEMS INC	NONE 9140A	L 10922D 92/04/16	1212C LASLB		2,324
20915	PHOTOMULTIPLIER TSI INC F-THERMO-SYSTEMS INC	NONE 9162	L 76397C 90/07/23	1212C LVLAB		3,470
284572	LENS, LASER	NONE	NAS 1 16277	1212C		25,544

	RECON/OPTICAL INC PACIFIC	SK3539	80/12/16	LVLAB		
801307	ILLUMINATOR, LASER FIBER NEWPORT/KLINGER FRMLY NEWPORT	NONE F-LFI	L 6304D 91/11/25	1212C LVLAB	1,480	
801950	COUPLER, FIBER OPTICS TSI INC F-THERMO- SYSTEMS INC	131 9271	L 25599D 92/12/16	1212C LVLAB	2,315	
1873026	DISPLAY UNIT APPLE COMPUTER INC	SG6110SD35J M2935	NAS 1 20005 97/06/11	1220 209	883	
1882812	DISPLAY UNIT VIEWSONICS INC	M884701449 VCDTS21385-1M	B ZCRD0787 99/09/21	1220 211	600	
1876477	PRINTER, ADP HEWLETT-PACKARD CO	USCB069619 C3982A	B ZCRD0787 98/02/18	1220 239	952	
1882813	COMPUTER, MICRO MICRON ELECTRONICS	1801680-0001 SE440BX2	B RDF/0049 99/09/21	1220 239	2,498	
1429909	COMPUTER, MICRO APPLE COMPUTER INC	TY62531L6MY M3979	NAS 1 20005 96/07/03	1220 240	2,245	
53629	TABLE, OPTICAL NEWPORT/KLINGER FRMLY NEWPORT	NONE ARS48M4A	NS12540 73/08/01	1221 123e	2,943	
61314	MONOCHROMATOR SPEX INDUSTRIES INC	32884 1702/04	L 31608C 89/06/19	1221 123e	28,871	
1422993	COMPUTER, MICRO APPLE COMPUTER INC	XC4412P91HU M1688	NAS 1 20006 94/11/17	1221 123e	4,711	
1427686	COMPUTER, MICRO GATEWAY 2000	NONE (VERIFIED) 486/33E	MISC 95/11/22	1221 123e	5,668	
1429668	COMPUTER, MICRO AMTAK	1118 ECSF1	L 3854 96/07/05	1221 123e	12,600	
1875830	DISPLAY UNIT SILICON GRAPHICS INC	2007311 GDM20D11	L 83379C 90/09/12	1221 220A	6,760	
1091527	COMPUTER, MINI DIGITAL EQUIPMENT CORP	AB20202L6M WS42A-BH	L 10717D 92/03/23	1221A 100	4,153	
1258220	COMPUTER, MINI SUN MICROSYSTEMS INC	333K001B 861	NAS 1 20004 93/09/28	1221A 207	64,034	

1088700	COMPUTER, MICRO	123F5456	NAS 1 18544	1221B	6,416
	SUN MICROSYSTEMS INC	47	91/10/23	149	
1261988	DISPLAY UNIT	9414FC5870	NAS 1 20004	1221B	2,247
	SONY CORP	GDM20D10	94/05/11	149	
1258219	DISPLAY UNIT	9337DX1594	NAS 1 20004	1221B	3,956
	SONY CORP	GDM1962B	93/09/28	116S	
61311	MONOCHROMATOR	3919	L 31608C	1221C	28,871
	SPEX INDUSTRIES INC	340E	89/06/19	123	
282106	RESISTOR, DECADE	NONE	L 85077B	1221C	1,075
	TRANSCAT	7010T	85/05/08	123	
1427098	COMPUTER, MICRO	60253	L 62890D	1221C	3,400
	NORTECH INC	PENTIUM	95/10/16	123	
1427357	COMPUTER, MICRO	3899712	L 63032D	1221C	4,281
	GATEWAY 2000	NEW TOWER	95/10/27	123	
1427684	COMPUTER, MICRO	NONE (VERIFIED)	MISC	1221C	156,500
	QUALITY COMPUTERS INC	TOWER486	95/11/22	123E	
61300	TRANSPORT, MAGNETIC TAPE	14930	L 57375C	1230	5,196
	SUMMUS COMPUTER SYSTEMS	442	89/06/12	131C	
848899	DISK DRIVE UNIT	F9402R5	L 68775C	1230	1,187
	APPLE COMPUTER INC	M2688	90/01/22	131C	
1092020	COMPUTER, MICRO	F5209498210	L 13325D	1230	4,116
	APPLE COMPUTER INC	M4200	92/04/16	131C	
1092021	DISPLAY UNIT	5504761	L 13325D	1230	5,114
	RASTEROPS CORP	GDM1950	92/04/16	131C	
1254905	COMPUTER, MICRO	314F1191	NAS 1 19468	1230	5,721
	SUN MICROSYSTEMS INC	144	93/04/27	131C	
1254906	DISPLAY UNIT	9311DX1643	NAS 1 19468	1230	3,900
	SONY CORP	GDM1962B	93/04/27	131C	
1429446	TRANSPORT, MAGNETIC TAPE	212967	L 3818	1230	814
	CLUB MAC	4-8GBDAT	96/06/10	131C	
1874883	COMPUTER, MICRO	BQJ0H	B ZCRD0691	1230	2,000

		DELL COMPUTER CORP F-PC'S LTD	MM8		97/09/25	131C	
1088745		COMPUTER, MICRO APPLE COMPUTER INC	F3137MSAC41 31	 .,	L 4162D 91/10/10	1230 131F	5,438
1876402		DISPLAY UNIT APPLE COMPUTER INC	WR7460W3947 M3705	 .,	NAS 1 20497 98/02/25	1230 131F	1,589
1877596		COMPUTER, MICRO APPLE COMPUTER INC	XB8073UNAZ3 M4405	 .,	B ZCRD0675 98/05/29	1230 131F	2,449
259411		SYNTHESIZER, FREQUENCY HEWLETT-PACKARD CO	1640A02082 3335A	 .,	NAS 1-17236 83/03/30	1230 133B	9,100
259415		POWER SUPPLY HEWLETT-PACKARD CO	2143A00302 8418B	 .,	NAS 1 17236 86/09/09	1230 133B	3,725
259992		DISPLAY, POLAR HEWLETT-PACKARD CO	2145A00401 8414B	 .,	NAS 1 17236 83/03/30	1230 133B	3,500
259993		ANALYZER, NETWORK HEWLETT-PACKARD CO	2138A00577 8410C	 .,	NAS 1 17236 83/03/30	1230 133B	6,825
259994		PHASE METER HEWLETT-PACKARD CO	2143A00523 8412B	 .,	NAS 1 17236 83/03/30	1230 133B	4,100
0467283	13	BRIDGE, IMPEDANCE GENRAD INC EMT ELECTRONIC TEST	889 1608A	 .,	L 69453 65/08/01	1230 133B	1,305
0467677	14	COUNTER, FREQUENCY HEWLETT-PACKARD CO	5134 5245L	 .,	NS13800 68/04/01	1230 133B	2,984
0468241	13	GENERATOR, SIGNAL, FM-AM HEWLETT-PACKARD CO	537-07720 202H	 .,	NS16384 66/09/01	1230 133B	1,482
0468419	19	OSCILLOSCOPE, GENERAL PURPOSE TEKTRONIX INC	B282047 7904	 .,	L 35871B 82/03/11	1230 133B	7,176
0468563	18	VOLTMETER, DIGITAL HEWLETT-PACKARD CO	1622A03914 3455A		L 84870A 78/10/26	1230 133B	3,366
0468966	18	PHASE METER, DIGITAL HEWLETT-PACKARD CO	1450A03071 3575A MODIFIED	 .,	L 7553B 80/04/14	1230 133B	4,229
0473655	13	METER, IMPEDANCE, VECTOR	640-00120		NS16400	1230	1,597

	HEWLETT-PACKARD CO	4800A	.,	67/02/01	133B		
0777690 17	PLUG-IN, COMPARATOR, O'SCOPE	B132760		L 8210A	1230	1,212	
	TEKTRONIX INC	7A13	.,	81/08/25	133B		
778321	PLUG-IN, AMPLIFIER, O'SCOPE	B040425		EMS MEMO	1230	1,095	
	TEKTRONIX INC	7A16A	.,	84/11/02	133B		
778322	PLUG-IN, AMPLIFIER, O'SCOPE	B040426		EMS MEMO	1230	1,095	
	TEKTRONIX INC	7A16A	.,	84/11/02	133B		
791046	PLUG-IN, AMPLIFIER, O'SCOPE	B257916		L 18251C	1230	2,232	
	TEKTRONIX INC	7A26	.,	87/04/08	133B		
791049	PLUG-IN, CURVE TRACER, O'SCOPE	B054450		L 18251C	1230	1,695	
	TEKTRONIX INC	7CTIN	.,	87/04/14	133B		
791050	AMPLIFIER, VERTICAL	B010989		L 18251C	1230	5,044	
	TEKTRONIX INC	7A42	.,	87/04/14	133B		
791065	PLUG-IN, COMPARATOR, O'SCOPE	105171		L 18251C	1230	3,230	
	TEKTRONIX INC	7A13	.,	87/05/15	133B		
801169	ANALYZER, SPECTRUM, PLUG-IN	B111038		L 17905D	1230	3,000	
	TEKTRONIX INC	7L13	.,	92/07/13	133B		
801645	CONVERTER, FREQUENCY	B011461		FOS	1230	1,592	
	TEKTRONIX INC	DC505A	.,	92/07/21	133B		
801646	GENERATOR, SQUARE WAVE	B033261		FOS	1230	2,000	
	TEKTRONIX INC	PG506	.,	92/07/21	133B		
1424172	COMPUTER, MICRO	FC45102C3YJ		NAS 1 20006	1230	2,611	
	APPLE COMPUTER INC	M2391	.,	95/02/16	133B		
20648	POWER SUPPLY	CO4238		L 60390C	1230	1,900	
	LAMBDA ELECTRONICS	LPT7202FM		89/09/07	133D		
58091	COMPUTER, MICRO	F8367AJ		L 44930C	1230	8,396	
	APPLE COMPUTER INC	M5000	.,	88/10/05	133D		
0528138 18	VOLTMETER, DIGITAL	1223A00723		NAS1 900099	1230	1,875	
	HEWLETT-PACKARD CO	3439A	.,	78/09/08	133D		

533716	OSCILLOSCOPE, PORTABLE	BO25284		L	77399B	1230	3,550
	TEKTRONIX INC	2445	.,		84/12/04	133D	
847465	DISPLAY UNIT	2027960		L	63849C	1230	4,395
	SONY CORP	GDM1952	.,		89/10/03	133D	
1092985	COMPUTER, MICRO, PORTABLE	CK2111YX703		L	14675D	1230	3,510
	APPLE COMPUTER INC	M5409	.,		92/05/18	133G	
1876403	PRINTER, ADP	BG73803P9WX		NAS 1	20497	1230	2,244
	APPLE COMPUTER INC	M2450	.,		98/02/25	133G	
531390	MICROSCOPE	NONE		L	99471	1230	676
	BAUSCH AND LOMB INC	31-20-83-35		61/12/01		164	
1873002	COMPUTER, MICRO, PORTABLE	QF71005M963		NAS 1	97101	1230	3,766
	APPLE COMPUTER INC	M3571	.,		97/05/22	192	
1428596	COMPUTER, MICRO	NONE (VERIFIED)		B	GHG1209	1230	1,985
	COMPU-LINK INC	NONE (VERIFIED)		96/04/12		193B	
1876307	COMPUTER, MICRO	DONPG		L	7367	1230	4,212
	DELL COMPUTER CORP F-PC'S LTD	MMP	.,		98/02/06	252	
20106	PLUG-IN, AMPLIFIER, O'SCOPE	B125201		L	44760C	1230	1,762
	TEKTRONIX INC	7A22		88/11/08		264C	
0427292 13	GENERATOR, VARIABLE PHASE	425-00539		L	74322	1230	1,207
	HEWLETT-PACKARD CO	203A		65/11/01		264C	
0465727 17	OSCILLOSCOPE, GENERAL PURPOSE	B092722		L	97080	1230	2,813
	TEKTRONIX INC	7904		74/01/01		264C	
0467203 19	OSCILLOSCOPE, GENERAL PURPOSE	B031755		L	50151B	1230	1,344
	TEKTRONIX INC	2215		83/03/18		264C	
0467255 13	METER, IMPEDANCE, VECTOR	640-00109		NS16400		1230	1,597
	HEWLETT-PACKARD CO	4800A		67/05/01		264C	
0467840 16	AMPLIFIER, ELECTROMETER	21516		L	92891	1230	2,021
	KEITHLEY INSTRUMENTS INC	604		73/06/01		264C	

0467885	17	VOLTMETER, DIFFERENTIAL HEWLETT-PACKARD CO	1106A01742 740B	.,	L 47550A 76/07/28	1230 264C	4,014
0467922	19	STANDARD, VOLTAGE FLUKE JOHN MFG CO INC	3090001 515A		L 47658B 83/02/02	1230 264C	3,135
0469708	18	ANALYZER, LOGIC TEKTRONIX INC	B052265 7D01F		L 66310A 77/09/26	1230 264C	4,247
0470924	14	VOLTMETER, DIFFERENTIAL FLUKE JOHN MFG CO INC	1055 887AB		L 26547 68/12/01	1230 264C	1,334
0527402	18	COUNTER, FREQUENCY HEWLETT-PACKARD CO	50403374 5245L		LX 7900276 79/05/25	1230 264C	3,774
0777599	18	PLUG-IN, AMPLIFIER, O'SCOPE TEKTRONIX INC	B222276 7A26		L 8787B 80/04/16	1230 264C	1,630
1261663		OSCILLOSCOPE, PORTABLE TEKTRONIX INC	B023531 2252		L 49873D 94/06/06	1230 264C	3,985
1262044		PRINTER, ADP APPLE COMPUTER INC	F14161S6108 M5890		NAS 1 20005 94/05/11	1230 264C	1,812
1091668		COMPUTER, MICRO APPLE COMPUTER INC	F12056FTC82 M5920	.,	L 11973D 92/03/30	1230 HALL	3,547
1882410		DISPLAY UNIT DELL COMPUTER CORP F-PC'S LTD	2948272 D1626HT	.,	L 7367 98/02/06	1230B 154	700
1741651		COMPUTER, MICRO NASA LANGLEY RESEARCH CENTER	NONE (VERIFIED) NONE (VERIFIED)		MISC 97/04/04	1230B 189	3,803
1091557		DISPLAY UNIT RADIUS INC	SNA203A10615 GDM1971		L 10629D 92/03/25	1230B 192	2,600
1264164		COMPUTER, MICRO APPLE COMPUTER INC	NONE(VERIFIED) M1688		L 36557D 93/08/02	1230B 192	5,560
1265822		COMPUTER, MICRO DYNAMIC DECISION INC	33304 NASADX4/100	.,	MISC-HQD 97/10/22	1230B 192	4,703
1266389		PRINTER, ADP HEWLETT-PACKARD CO COMPUTER	JPBF001986 C2001A	.,	MISC-HQD 97/10/22	1230B 192	1,342

1427618	DISPLAY UNIT SONY CORP	SSJ531A17056 461	.,	NAS 1 20005 95/11/02	1230B 192	1,919
1428605	COMPUTER, MICRO APPLE COMPUTER INC	FC5391A544H M2391		L 46945D 96/04/09	1230B 193	1,038
0464497 19	MICROSCOPE BAUSCH AND LOMB INC	NONE NONE	.,	NAS 1 10512 83/06/20	1230B 193A	1,000
1876401	COMPUTER, MICRO APPLE COMPUTER INC	XB7391P7ACQ M5433	.,	NAS 1 20497 98/02/25	1230B 193A	3,407
19938	COUNTER, FREQUENCY TEKTRONIX INC	B17466 DC503		NAS 1 16593 86/08/29	1230B 193B	1,093
58923	MULTIMETER, DIGITAL FLUKE JOHN MFG CO INC	4609254 8842A05		L 46884C 88/11/14	1230B 193B	1,135
220323	OSCILLOSCOPE, PORTABLE TEKTRONIX INC	106617 2445		L 94718B 85/12/18	1230B 193B	3,410
777969	OSCILLOSCOPE, MODULAR TEKTRONIX INC	B025702 SC502		L 90047A 79/04/12	1230B 193B	1,282
1260181	COMPUTER, MICRO DELL COMPUTER CORP F-PC'S LTD	3KQFC 466V/XPS		40750004 94/06/20	1230B 193B	2,106
1262839	COMPUTER, MICRO GATEWAY 2000	2364208 4DX2-66		41290001 94/07/22	1230B 193B	2,319
1611838	OSCILLOSCOPE, DIGITAL, PORTABL TEKTRONIX INC	B020462 THS720A		L 67701D 98/01/26	1230B 193B	2,134
1611841	OSCILLOSCOPE, DIGITAL, PORTABL TEKTRONIX INC	B021446 THS720A		L 67701D 98/01/26	1230B 193B	2,134
1873656	CAMERA, TELEVISION PULNIX AMERICA INC	16404 TM7CN		NAS 1 20013 96/05/10	1230B 193B	795
1874061	COMPUTER, MICRO ATIPA INTERNATIONAL	NONE (VERIFIED) NONE (VERIFIED)		B ZCRD0691 97/08/14	1230B 193B	1,850
1876939	COMPUTER, MICRO, PORTABLE APPLE COMPUTER INC	QF73517AAZB M3571		B ZCRD1176 98/04/21	1230B 193B	2,245
1878863	COMPUTER, MICRO,	6724BB320311		B ZCRD1176	1230B	1,275

	PORTABLE COMPAQ COMPUTER CORP	ARMADA7710MT		98/08/25	193B	
1610942	DISK DRIVE UNIT IOMEGA	W15T380GCE V1000S	B	DMF4964 97/07/09	1230B 193C	50C
1876045	PLOTTER, GRAPHICS SUMMAGRAPHICS CORP	719508-00038 H17100	L .,	74901C 98/01/23	1230B 194	4,216
1876994	MICROSCOPE LEICA	507891 MEF4M	L	7571 98/04/10	1230B 289	75,37C
60742	DISPLAY UNIT SONY CORP	2013733 GDM1952	L	51946C 89/03/27	1230B 293	3,662
1610776	DISK DRIVE UNIT NEC AMERICA INC BROADCASTING	6260004G111 CDR602	B .,	DMF4779 97/06/09	1230B 0.285	519
1877292	COMPUTER, MICRO APPLE COMPUTER INC	XB8174DZD6L M3979	B	ZCRD1055 98/05/20	1232T T-2	1,999
1880013	DISPLAY UNIT VIEWSONICS INC	QH81917509 P810-3M	B	DF/00000 98/12/09	1232T T-2	1,060
G073779	PRINTER, ADP APPLE COMPUTER INC	CA943CKP M6000	L	70746C 90/03/08	1237T 100	3,149
1085193	PRINTER, ADP HEWLETT-PACKARD CO	3048A74071 33449A	L	93708C 91/04/19	1237T 100	1,557
1085412	COMPUTER, MICRO GATEWAY 2000	188702 AF424I3865X	L	92568C 91/05/03	1237T 100	2,025
1157795	PRINTER, ADP HEWLETT-PACKARD CO	3049J013PE 33471A	NAS 1	19000 92/12/23	1237T 100	817
1157802	FACSIMILE SET MURATA BUSINESS SYSTEMS INC	2195 F70		22020001 92/12/28	1237T 100	1,350
1158459	PRINTER, ADP APPLE COMPUTER INC	923367 2NT	NAS	1-19000 91/09/03	1237T 100	3,100
1255444	BINDING MACHINE GENERAL BINDING CORP	FB08533 470KM	NAS 1	19000 93/05/05	1237T 100	1,537
1256581	COMPUTER, MICRO APPLE COMPUTER INC	XB329P9MCC7 M1206	NAS 1	19468 93/07/30	1237T 100	3,746

1258685	COMPUTER, MICRO APPLE COMPUTER INC	XC335ALE M9020		L 40643D 93/11/02	1237T 100	5,871
1258703	MONITOR, TELEVISION SONY CORP	7003280 KV32TS20		NAS 1 19000 93/10/14	1237T 100	929
1260565	COMPUTER, MICRO APPLE COMPUTER INC	XB3478PA M9020		L 44103D 94/02/24	1237T 100	3,895
1262490	COMPUTER, MICRO APPLE COMPUTER INC	CK4180AF1H2 M1688		L 50552D 94/06/28	1237T 100	8,344
1264367	COMPUTER, MICRO APPLE COMPUTER INC	XB4370JA1H0 M1688		NAS 1 20006 94/10/06	1237T 100	4,680
1264407	COMPUTER, MICRO APPLE COMPUTER INC	XB4360Y91H0 M1688		NAS 1 20006 94/10/06	1237T 100	4,680
1424183	COMPUTER, MICRO APPLE COMPUTER INC	XB5050PY45B M1688		NAS 1 20006 95/02/23	1237T 100	4,142
1424562	COMPUTER, MICRO AMS INC	ECP40260 104PN486E		NAS 1 19000 95/03/07	1237T 100	2,528
1424692	COMPUTER, MICRO APPLE COMPUTER INC	XB5120BC45B M1688		NAS 1 20006 95/04/06	1237T 100	4,142
1880704	COMPUTER, MICRO APPLE COMPUTER INC	SG8431TC3QE M4405		B ZCRD0528 99/03/11	1237T 100	2,155
1263719	COMPUTER, MICRO GATEWAY 2000	2210193 BABY AT		40820002 94/09/15	1237T 100B	1,580
1264399	DISPLAY UNIT APPLE COMPUTER INC	S44351PA1XY M1823		NAS 1 20006 94/10/12	1237T 101	1,866
56345	PRINTER, ADP APPLE COMPUTER INC	CAB22EEU M6000		L 31733C 88/07/12	1237T 103	5,815
1430977	COMPUTER, MICRO APPLE COMPUTER INC	XB6211EX7P4 M3409	R.,	NAS 1 20005 96/08/08	1237T 103	4,219
1742764	DISPLAY UNIT NEC TECHNOLOGIES INC DIV OF NE	7101414KA JC1745UMA	R.,	NAS 1 20004 97/05/08	1237T 103	723
1264398	DISPLAY UNIT APPLE COMPUTER INC	S44351TA1XY M1823		NAS 1 20006 94/10/12	1237T 104	1,866

1264435	PRINTER, ADP	BG3281AJ120	NAS 1 20006	1237T	599
	APPLE COMPUTER INC	M2100	94/10/12	104	
1879798	COMPUTER, MICRO	N184108436	L 8419	1237T	9,077
	DIGITAL EQUIPMENT CORP	SNB3EBU-SH	98/10/19	104	
1879799	DISPLAY UNIT	4K82356579	L 8419	1237T	1,243
	DIGITAL EQUIPMENT CORP	SNPCXAV-WZ	98/10/19	104	
G078325	PRINTER, ADP	CA028Z69	L 83177C	1237T	2,822
	APPLE COMPUTER INC	M6000	90/09/25	105	
1158448	PRINTER, ADP	923370	NAS 1-19000	1237T	3,100
	APPLE COMPUTER INC	2NT	91/09/03	105	
G073531	PRINTER, ADP	9001-5-36984	L 68926C	1237T	9,980
	GENICOM CORP	4470	90/02/06	106	
G073541	SERVER, NETWORK	BAR0811	L 68924C	1237T	2,856
	EMULEX CORP	P4016NL	90/02/07	106	
62115	COMPUTER, MINI	WF91705867	L 54860C	1237T	30,267
	DIGITAL EQUIPMENT CORP	640QR-B2DV330T2	89/05/23	106	
142703	EXPANSION BOX	WF73314902	L 22479C	1237T	3,689
	DIGITAL EQUIPMENT CORP	BA23A	87/08/27	106	
1156057	DISK DRIVE UNIT	TK500406	L 17907D	1237T	2,134
	SEAGATE	ST41650N	92/07/17	106	
849158	CABINET, FILE, SECURITY	AM7818	1-18054F	1237T	4,368
	ART METAL U S A INC	CLASS6	86/04/15	107	
1257696	COMPUTER, MICRO	XB346L3613Y	L 42518D	1237T	4,863
	APPLE COMPUTER INC	M9020	93/12/29	107	
1087000	DISPLAY UNIT	2003837	L 97503C	1237T	2,765
	SUPERMAC TECHNOLOGY	STD9750	91/07/17	108	
1159065	COMPUTER, MICRO	F3247A4U673	L 26535D	1237T	6,385
	APPLE COMPUTER INC	M4300	92/12/30	108	
1875212	DISPLAY UNIT	20701212	NAS 1 19724	1237T	5,000
	SONY CORP	GDM1961	00/04/03	108	
398671	PLOTTER, GRAPHICS	2548A02341	NAS 1 18305	1237T	23,765
	HEWLETT-PACKARD CO	5786B(HP86A)	86/09/05	206	
1088908	COMPUTER, MINI	35002270	L 3620D	1237T	12,600

	SILICON GRAPHICS INC	CMNB003	91/10/10	206	
1093196	DISPLAY UNIT	S12102N9D07	NAS 1 19468	1237T	1,199
	APPLE COMPUTER INC	M1298	92/06/02	206	
1158443	COPIER, ENGINEERING	646037531	DD1342	1237T	4,590
	XEROX CORP	2510	90/02/07	206	
1428209	DISPLAY UNIT	2011948	MISC-AMES	1237T	12,000
	SONY CORP	GDM20D11	96/02/14	206	
1430138	COMPUTER, MICRO	8848	NAS 1 20005	1237T	6,113
	POWER COMPUTING CORP	POWER TOWER604/	96/07/17	206	
1256178	DISPLAY UNIT	314A10071	L 31239D	1237T	2,149
	SONY CORP	GDM1971	93/06/30	207	
1256179	COMPUTER, MICRO	XB30QDPFQCC7	L 31239D	1237T	3,514
	APPLE COMPUTER INC	M1206	93/06/30	207	
1084394	DISK DRIVE UNIT	1917371	L 90514C	1237T	8,813
	TRIMARCHI INC	DA15-3H1	91/03/05	209	
1158826	DISPLAY UNIT	3151	NAS 1 19468	1237T	1,560
	SILICON GRAPHICS INC	D3M92A	92/11/18	209	
1255020	COMPUTER, MINI	35257939	NAS 1 19468	1237T	18,170
	SILICON GRAPHICS INC	CMNB003B	92/11/18	209	
1255067	COMPUTER, MICRO	F331739LCC7	L 25598D	1237T	3,181
	APPLE COMPUTER INC	M1206	93/05/11	209	
1257432	DISPLAY UNIT	3290439	L 36448D	1237T	2,485
	RADIUS INC	381	93/09/01	209	
1155628	COMPUTER, MICRO	F12174RJC81	L 18201D	1237T	3,918
	APPLE COMPUTER INC	M5920	92/06/26	211	
1156702	DISK DRIVE UNIT	3231	L 4251D	1237T	2,124
	PINNACLE MICRO INC	REO130S	91/10/11	211	
1256124	DISPLAY UNIT	3140159	L 31231D	1237T	2,230
	SONY CORP	GDM1971	93/06/25	211	
1091661	DISPLAY UNIT	19196	L 11432D	1237T	1,750
	E-MACHINES INC	GDM1601	92/03/17	214	
1431729	COMPUTER, MICRO	5674704	L 64726D	1237T	4,104
	GATEWAY 2000	MTX TOWER	96/09/20	216	

1433142	COMPUTER, MICRO AC TECH	49451608142 486	MISC-HQD 95/03/10	1237T 216	1,367
56040	PRINTER, ADP HEWLETT-PACKARD CO	2803J19206 33440A	L 39016C 88/06/22	1237T 219	1,660
142504	BUFFER, PRINTER, MULTIPORT BAY TECHNICAL ASSOCIATES	153232 710E	L 25058C 87/08/14	1237T 219	933
1091181	COMPUTER, MICRO GATEWAY 2000	461188 B922512AM	L 10013D 92/03/03	1237T 219	2,840
1742540	COMPUTER, MICRO GATEWAY 2000	7036595 ATX TOWER	L 66290D 97/05/01	1237T 219	4,633
1873234	DISK DRIVE UNIT SMART AND FRIENDLY INC	00293-001181 CD-R4006PRO EXT	B DC01114 97/06/06	1237T 219	999
0461799 18	PRINTER, ADP HEWLETT-PACKARD CO	2051S41450 82143A	L 29931B 81/09/04	1237T 220	510
846974	CALCULATOR, ELECTRONIC HEWLETT-PACKARD CO	1333A20455 HP65	1-18054FG47 89/09/23	1237T 220	842
1741153	COMPUTER, MICRO GATEWAY 2000	6286986 ATX TOWER	L 5167 97/01/10	1237T 220	6,085
1088518	DISPLAY UNIT SUN MICROSYSTEMS INC	9128DX0020 GDM1962B	L 99157C 91/08/19	1237T 303	600
1088519	COMPUTER, MICRO SUN MICROSYSTEMS INC	125F0035 147B	L 99157C 91/08/19	1237T 303	14,796
1088520	TRANSPORT, MAGNETIC TAPE SUN MICROSYSTEMS INC	130G2931 411	L 99157C 91/08/19	1237T 303	1,280
1159718	PRINTER, ADP APPLE COMPUTER INC	CA23036H M6000	L 26566D 93/02/01	1237T 303	2,555
1255653	COMPUTER, MICRO APPLE COMPUTER INC	F331372Y677 M4300	L 33336D 93/05/20	1237T 303	5,223
1259187	DISK DRIVE UNIT ANDATACO	TK606272 X165S51AX2S5X	NAS 1 20004 93/12/08	1237T 303	2,696
1092335	COMPUTER, MINI	211F1736	NAS 1 19468	1237T	11,852

	SUN MICROSYSTEMS INC	147B4/75		92/04/16	304	
1254963	DISK DRIVE UNIT	313U7419		NAS 1 19724	1237T	796
	SUN MICROSYSTEMS INC	411		93/04/27	304	
G075612	DISK/TAPE SUBSYSTEM	NONE		L 75572C	1237T	11,335
	TRIMM INDUSTRIES INC	DA15XX		90/06/06	305	
1156195	DISK DRIVE UNIT	Q0979		L 17562D	1237T	3,665
	U S DESIGN CORP	07-14005		92/08/11	305	
1255754	COMPUTER, MINI	AB31603JUZ		NAS 1 19724	1237T	11,277
	DIGITAL EQUIPMENT CORP	PE40A-A9		93/06/01	305	
1262448	COMPUTER, MICRO	2330927		L 50174D	1237T	5,400
	GATEWAY 2000	NEW TOWER		94/06/21	305	
1742912	DISK DRIVE UNIT	485020548		B DFC3437	1237T	1,395
	PINNACLE MICRO INC	VERTEX2.6GB		97/08/21	305	
1085825	COMPUTER, MICRO	205841		L 95032C	1237T	3,490
	GATEWAY 2000	486/25C		91/06/14	306	
1093066	DISPLAY UNIT	24K24810C		L 13019D	1237T	825
	NEC INFORMATION SYSTEMS INC	JC1531VMA		92/05/22	306	
1256155	COMPUTER, MINI	AB24003027		NAS 1 19724	1237T	23,856
	DIGITAL EQUIPMENT CORP	PE50A-A9		93/06/30	306	
848486	PRINTER, ADP	CA9138HK		L 65666C1	1237T	4,612
	APPLE COMPUTER INC	M6000	R.,	89/11/17	307	
1084133	COMPUTER, MICRO	149923		L 88476C	1237T	3,785
	GATEWAY 2000	486/25		91/02/15	307	
1260441	COMPUTER, MICRO	208377		L 45904D	1237T	3,814
	GATEWAY 2000	NEW TOWER	R.,	94/03/28	307	
1260442	DISPLAY UNIT	MH1934048999		L 45904D	1237T	1,500
	GATEWAY 2000	CS1776LER	R.,	94/03/28	307	
1262959	COMPUTER, MICRO	2397850		L 50995D	1237T	2,059
	GATEWAY 2000	BABY AT	R.,	94/07/21	307	
1431941	DISPLAY UNIT	MH3534031687		B DC01072	1237T	683
	PRINCETON GRAPHIC SYSTEMS	DX17F		96/10/23	307	
1084876	COMPUTER, MICRO	F11072JF		L 87087C	1237T	4,321

	APPLE COMPUTER INC	M5780(11CI)	91/03/28	309		
846118	COMPUTER, MICRO DIGITAL EQUIPMENT CORP	AB921067X6 VS42A-BC	L 53862C 89/06/22	1237T 402	8,875	
1093483	DISPLAY UNIT NANAO-USA	47970612-USZA MA1660	80330121400 92/08/17	1237T 403	1,275	
1093487	COMPUTER, MICRO GATEWAY 2000	621474 486/33C	80330121400 92/08/17	1237T 403	2,320	
1264431	DISPLAY UNIT APPLE COMPUTER INC	S44351D31XY M1823	NAS 1 20006 94/10/12	1237T 403	1,866	
1264434	PRINTER, ADP APPLE COMPUTER INC	BG332143120 M2100	NAS 1 20006 94/10/12	1237T 403	599	
1159016	COMPUTER, MINI SILICON GRAPHICS INC	37056566 CMNB001	NAS 1 19468 92/12/16	1244 116	27,680	
1159017	DISPLAY UNIT SILICON GRAPHICS INC	205006324 HL7965KWSG	NAS 1 19468 92/12/16	1244 116	1,560	
1883247	MODEL, INLET, R.E.S.T NASA LANGLEY RESEARCH CENTER	NONE (VERIFIED) NONE (VERIFIED)	MISC 98/01/01	1247B 111	70,000	
54495	PRINTER, ADP APPLE COMPUTER INC	F741118 M0188	L 32753C 88/03/23	1247B 117	3,815	
1881889	COMPUTER, MICRO DELL COMPUTER CORP F-PC'S LTD	0087M MMP ,	B RBD/0990 99/07/14	1247B 117	2,466	
58202	RECORDER, TAPE, ANALOG BELL & HOWELL CO	457 MARS2000LT	LX 88001 88/09/14	1247B 117F	36,451	
141852	CONTROL, SEARCH, TAPE DATUM INC F-PERIPHERAL	1628 9241-715	L 19410C 87/07/14	1247B 117F	5,937	
0470083 18	GENERATOR, TIME CODE DATUM INC F-PERIPHERAL	655 9310MODIFIED	L 26307B 81/09/14	1247B 117F	3,558	
1092322	DISPLAY UNIT NEXT COMPUTER INC	Y2B002193 N4005 ,	L 13247D 92/04/06	1247B 117F	2,726	
1092323	COMPUTER, MICRO NEXT COMPUTER INC	ABA0004486 N1000A ,	L 13247D 92/04/06	1247B 117F	10,355	

1092725	DISK DRIVE UNIT NEXT COMPUTER INC	ACY0005546 N3010	,	L 13668D 92/06/24	1247B 117F	542
1093231	PRINTER, ADP NEXT COMPUTER INC	AAC0015098 N2000	,	L 13668D 92/06/08	1247B 117F	1,400
1158595	DISK DRIVE UNIT INFINITY PHOTO-OPTICAL	1Y102-3402 NI03SZ	,	L 24305D 92/11/09	1247B 117F	1,359
1255042	DISPLAY UNIT SONY CORP	2001633 2075RO		L 31802D 93/05/03	1247B 117F	1,965
1256168	COMPUTER, MICRO INTERNATIONAL BUSINESS MACHINE	97-M9DB7 955230J		L 35024D 93/06/29	1247B 117F	4,988
1259441	DISK DRIVE UNIT PERIPHERAL LAND INC	5158 INFINITY OPTICA	,	L 43409D 94/01/13	1247B 117F	1,279
1263816	COMPUTER, MICRO APPLE COMPUTER INC	CK4195SY1H2 M1688	,	NAS 1 20005 94/08/29	1247B 117F	5,094
1611722	CAMERA, DIGITAL OLYMPUS OPTICAL CO LTD	1018185 D500L		B ZCRD0753 98/01/26	1247B 117F	890
52735	SYSTEM, DATA ACQUISITION NEFF INSTRUMENT CORP	207 620520AK		L 22357C 87/11/12	1265 103	16,800
53147	SYSTEM, DATA ACQUISITION NEFF INSTRUMENT CORP	273 620600AE		L 23952C 87/11/30	1265 103	33,408
0424267 19	ANALYZER, SOUND RION LTD	10620630 NA23		L 54123B 83/06/15	1265 103	1,500
1088320	SYSTEM, DATA ACQUISITION NEFF INSTRUMENT CORP	106 490100		L 82818C 91/09/27	1265 104	24,800
1089050	PRINTER, ADP BROTHER INTERNATIONAL CORP	F19147247 HL8V		L 4156D 91/10/16	1265 104	2,228
1431390	COMPUTER, MICRO MICRON ELECTRONICS	674798-0001 M55HI-PLUS-P166		B DGF1126 96/08/09	1265 104	2,093
1873024	COMPUTER, MICRO MICRON ELECTRONICS	A3735-0001 M5HIPLUSP200MT		L 5459 97/04/22	1265 104	2,739

1873025	DISPLAY UNIT HITACHI MFG CO	G7A009113 CM801U	L	5459 97/04/22	1265 104	1,200
1875161	INTERFACE, SCANNER PRESSURE SYSTEMS INC	755 9015	L	67368D 98/01/28	1265 104	3,500
1875162	INTERFACE, SCANNER PRESSURE SYSTEMS INC	756 9015	L	67368D 98/01/28	1265 104	3,500
1875163	INTERFACE, SCANNER PRESSURE SYSTEMS INC	757 9015	L	67368D 98/01/28	1265 104	3,500
1875164	INTERFACE, SCANNER PRESSURE SYSTEMS INC	758 9015	L	67368D 98/01/28	1265 104	3,500
0417609 19	STANDARD, VOLTAGE ELECTRONIC DEVELOPMENT CO	10946 501J	L	34276B 82/02/04	1265 110	3,425
1423647	CALIBRATOR, PRESSURE PRESSURE SYSTEMS INC	1180 8432	L	62886D 95/11/17	1265 111	6,880
1090900	PRINTER, ADP BROTHER INTERNATIONAL CORP	A29112596 HL8	L	10749D 92/03/10	1265 112	1,915
1423372	EXPANDER, INPUT/OUTPUT NEFF INSTRUMENT CORP	979 470101	L	57474D 95/01/12	1265 112	2,400
1423373	EXPANDER, INPUT/CONTROL NEFF INSTRUMENT CORP	980 470200	L	57474D 95/01/12	1265 112	4,800
G075821 18	MONITOR, TELEVISION MATSUSHITA ELEC INDUS CO	011667/011668 WV5312	L	8288B 80/04/11	1265 113	596
37922	TRANSPORT, MAGNETIC TAPE ANDATACO	6564287 X5X5E5JX2S2X	B	DGF1093 96/04/24	1265 113	2,112
142594	STANDARD, VOLTAGE ELECTRONIC DEVELOPMENT CO	15132 501J	L	23086C 87/08/20	1265 113	2,803
802602	ANALOG INPUT UNIT PRESSURE SYSTEMS INC	184 8440	L	41548D 94/02/28	1265 113	4,557
1089051	PRINTER, ADP	F19147471	L	4156D	1265	2,228

	BROTHER INTERNATIONAL CORP	HL8V	91/10/16	113		
1090439	SYSTEM, DATA ACQUISITION	140	L 4526D	1265	4,992	
	NEFF INSTRUMENT CORP	490100	92/02/07	113		
1090440	SYSTEM, DATA ACQUISITION	141	L 4526D	1265	3,456	
	NEFF INSTRUMENT CORP	490101	92/02/07	113		
1258136	DISPLAY UNIT	Y3G001036	31670003	1265	1,749	
	HITACHI MFG CO	2997	93/11/04	113		
1423422	DISPLAY UNIT	4K41923845	L 57686D	1265	1,999	
	DIGITAL EQUIPMENT CORP	VRC21HA	95/01/11	113		
1423423	SERVER, DATA CENTER	KA450LLZK6	L 57686D	1265	24,895	
	DIGITAL EQUIPMENT CORP	450YBA9	95/01/11	113		
1423646	DIGITIZER, SCANNER	461	L 62886D	1265	3,760	
	PRESSURE SYSTEMS INC	8425	95/11/17	113		
1425262	COMPUTER, MICRO	347219-0001	NAS 1 20260	1265	3,086	
	MICRON ELECTRONICS	P90PCI	95/06/15	113		
1431144	COMPUTER, MICRO	647323-0001	B DGF1126	1265	2,093	
	MICRON ELECTRONICS	M55HIPLUS-P166M	96/08/21	113		
1431392	COMPUTER, MICRO	674041-0001	B DGF1126	1265	2,093	
	MICRON ELECTRONICS	M55HI-PLUS-P166	96/09/18	113		
1739656	PRINTER, ADP	Q0126760	L 5000	1265	4,443	
	QMS INC	QMS2425-1	96/11/06	113		
53146	INPUT ASSEMBLY, CONTROL	276	L 23952C	1265	33,408	
	NEFF INSTRUMENT CORP	620600AA	87/11/30	114		
53148	SYSTEM, DATA ACQUISITION	230	L 23952C	1265	16,800	
	NEFF INSTRUMENT CORP	620520AK	87/11/30	114		
140094	SIGNAL CONDITIONER	14380	NAS 1 18318	1265	2,784	
	NEFF INSTRUMENT CORP	620300	87/06/04	114		
21917	POWER SUPPLY, SPECIAL PURPOSE	371	L 3751D	1265	2,500	
	PCB PIEZOTRONICS	483B07	91/10/29	131A		

21918	POWER SUPPLY, SPECIAL PURPOSE	370	L 3751D	1265	2,500
	PCB PIEZOTRONICS	483B07	91/10/04	131A	
801546	POWER SUPPLY, SPECIAL PURPOSE	489	L 27781D	1265	2,400
	PCB PIEZOTRONICS	483B07	93/02/05	131A	
1092683	DIGITIZER, SCANNER	283	L 14442D	1265	3,740
	PRESSURE SYSTEMS INC	8425	92/06/18	131A	
1605031	MODULE, PRESSURE SCANNER	A481077	L 5542	1265	7,760
	PRESSURE SYSTEMS INC	ESP48	97/04/28	131A	
20502	POWER SUPPLY, SPECIAL PURPOSE	674	L 47377C	1265	2,250
	PCB PIEZOTRONICS	483A07	88/11/29	TEST	
20503	POWER SUPPLY, SPECIAL PURPOSE	675	L 47377C	1265	2,250
	PCB PIEZOTRONICS	483A07	88/11/29	TEST	
20504	POWER SUPPLY, SPECIAL PURPOSE	676	L 47377C	1265	2,250
	PCB PIEZOTRONICS	483A07	88/11/29	TEST	
21919	POWER SUPPLY, SPECIAL PURPOSE	372	L 3751D	1265	2,500
	PCB PIEZOTRONICS	483B07	91/10/04	TEST	
849472	SAFE, 5-DRAWER	NONE	L 70394C	1268A	1,260
	MOSLER SAFE CO	7110-00-919-919	90/03/13	2119D	
1155682	DISK DRIVE UNIT	TM506305	NAS 1 19468	1268D	3,650
	SEAGATE	ST4767N	92/07/13	2404	
1259208	DISK DRIVE UNIT	110010303	L 41869D	1293C	2,562
	PINNACLE MICRO INC	PMO650	93/12/15	148	
1425415	PRINTER, ADP	D550812V39M	L 61637D	1293C	2,075
	APPLE COMPUTER INC	M2680	95/06/27	148	
1429333	PRINTER, ADP	CB538XV4YY	NAS 1 20005	1293C	5,837
	APPLE COMPUTER INC	M3036	96/06/07	148	
1741446	COMPUTER, MICRO	XB6520L08C7	NAS 1 20004	1293C	3,760
	APPLE COMPUTER INC	M3098	97/02/27	148	
1873087	DISPLAY UNIT	7123811	NAS 1 97101	1293C	1,667

	SONY CORP	CPD300SFT	97/06/12	148		
1878297	SCANNER, COMPUTER UMAX DATASYSTEMS INC	HAW0017B00028 POWER LOOKLL	B ZCRD1133 98/07/30	1293C 148	1,296	
53000	BALANCE, ANALYTICAL METTLER INSTRUMENT CORP	G55147 AE240S	L 30050C 87/12/15	1293C 252	2,625	
1874076	PRINTER, ADP HEWLETT-PACKARD CO	USBC023694 C4212A	L 66430D 97/07/30	1293C 252	800	
0419926 18	BEAM CONDENSER NICOLET INSTRUMENT CORP	222-010600 BC7000	L 24694B 81/06/15	1293C 268	1,498	
0419458 14	PRESS, PELLET CARVER FRED S INC	6803 21005-43	L 21493 75/07/09	1293C 271	1,009	
1087162	SCANNER, COMPUTER LACIE LTD	34814 SILVERSCANNER	L 99180C 91/07/29	1293C 0.148	1,999	
284458	MICROSCOPE, INFRARED NICOLET INSTRUMENT CORP	184 0036-005	L 86718B 85/09/30	1293C 0.268	12,400	
221369	READOUT, DIGITAL SONY CORP	993704 LM22S22R	L 97183B 86/02/27	1296 107	2,363	
1877600	COMPUTER, MICRO INTERLINK	NONE (VERIFIED) NONE (VERIFIED)	B DIH0002 98/06/01	1299 110	1,710	
20076	CONTROLLER, TEMPERATURE EUROTHERM INT'L TURNBULL CTL	18808 822	L 42434C 88/08/24	1299 130	1,345	
20078	CONTROLLER, TEMPERATURE EUROTHERM INT'L TURNBULL CTL	38808 822	L 42434C 88/08/24	1299 130	1,345	
1883029	COMPUTER, MICRO DELL COMPUTER CORP F-PC'S LTD	40BMZ MMS ,	B ZCRD0628 99/10/15	1299 226	2,404	
1884578	DISK DRIVE UNIT SMART AND FRIENDLY INC	00479-003534 MACH12	B RDH/0256 00/03/15	1299 226	704	

TOTAL **TOTAL**

ITEMS:	ACQ VALUE:
442	3,080,322