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HARDWARE SURVEY FOR THE
AVIONICS TEST BED

Prepared By
Lockheed Engineering and Management Services Company, Inc.
Houston, Texas
Contract NAS 9-15800
For
AVIONICS SYSTEMS DIVISION

JUL 7 1981

LEMSCO-16838
**Abstract**

A survey of major hardware items that could possibly be used in the development of an Avionics Test Bed for Shuttle attached or autonomous large space structures was conducted at NASA JSC building 16. The results of the survey were organized to show the hardware laboratory usage. Computer systems were emphasized by detailing each one on a standard form and placing the forms in appendices.

17. Key Words (Suggested by Author(s))

- Hardware Elements
- Avionics Test Bed
- Building 16 NASA JSC
- Laboratory

18. Distribution Statement

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<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. INTRODUCTION</td>
<td>1-1</td>
</tr>
<tr>
<td>2. DATA SYSTEMS LABORATORY</td>
<td>2-1</td>
</tr>
<tr>
<td>3. POWER DISTRIBUTION AND CONTROL LABORATORY (PDCL)</td>
<td>3-1</td>
</tr>
<tr>
<td>4. INERTIAL SYSTEMS LABORATORY</td>
<td>4-1</td>
</tr>
<tr>
<td>5. INERTIAL COMPONENTS LABORATORY</td>
<td>5-1</td>
</tr>
<tr>
<td>6. FLIGHT CONTROLS LABORATORY</td>
<td>6-1</td>
</tr>
<tr>
<td>7. SHUTTLE AVIONICS INTEGRATION LABORATORY (SAIL)</td>
<td>7-1</td>
</tr>
<tr>
<td>7.1 SHUTTLE TEST STATION (STS)</td>
<td>7-1</td>
</tr>
<tr>
<td>7.1.1 TEST OPERATIONS CENTER (TOC)</td>
<td>7-2</td>
</tr>
<tr>
<td>7.1.2 MARSHALL MATED ELEMENTS SIMULATOR (MMES)</td>
<td>7-2</td>
</tr>
<tr>
<td>7.1.3 LAUNCH PROCESSING SYSTEM (LPS)</td>
<td>7-3</td>
</tr>
<tr>
<td>7.1.4 SHUTTLE AVIONICS TEST SYSTEM (SATS)</td>
<td>7-3</td>
</tr>
<tr>
<td>7.1.5 PAYLOAD ACCEPTANCE TEST STATION (PATS)</td>
<td>7-3</td>
</tr>
<tr>
<td>7.1.6 VERIFICATION TEST STATION (VTS)</td>
<td>7-3</td>
</tr>
<tr>
<td>7.1.7 QUICK LOOK STATION (QLS)</td>
<td>7-3</td>
</tr>
<tr>
<td>7.1.8 APPLICATIONS VERIFICATION LABORATORY (AVL)</td>
<td>7-4</td>
</tr>
<tr>
<td>7.1.9 SHUTTLE DYNAMICS SIMULATOR (SDS)</td>
<td>7-4</td>
</tr>
<tr>
<td>7.1.9.1 Vehicle Dynamics Simulator (VDS)</td>
<td>7-4</td>
</tr>
<tr>
<td>7.1.9.2 Simulator Recorder Subsystem (SRS)</td>
<td>7-4</td>
</tr>
<tr>
<td>7.1.9.3 Simulation Interface Subsystem (SIS)</td>
<td>7-5</td>
</tr>
<tr>
<td>7.1.10 ELECTRONIC VISUAL DISPLAY (EVD)</td>
<td>7-5</td>
</tr>
<tr>
<td>7.1.11 SOFTWARE DEVELOPMENT LABORATORY</td>
<td>7-5</td>
</tr>
<tr>
<td>7.2 GUIDANCE, NAVIGATION AND CONTROL TEST STATION (GTS)</td>
<td>7-5</td>
</tr>
</tbody>
</table>
Section 7.2.1 GTS DYNAMICS SIMULATOR (GDS) .................. 7-6
7.2.1.1 Flight Dynamics Simulation (FDS) .................. 7-6
7.2.1.2 GTS Recording Device (GRD) .................. 7-6
7.2.1.3 GTS Simulation Interface (GSI) .................. 7-7

7.3 SHUTTLE ENGINEERING SIMULATOR (SES) .................. 7-7

Appendix
A. COMPUTER SYSTEMS .................................. A-1
B. SAIL COMPUTER SYSTEMS .................. B-1
1. INTRODUCTION

A large space structures (LSS) avionics test bed (ATB) has been proposed for development at NASA JSC in building 16. The ATB will be used in the development of Shuttle attached or autonomous large space structures such as the proposed Space Operations Center (SOC). A comprehensive survey of hardware and computer software presently available in building 16 was required for the generation of an ATB development plan. The survey in this report covers the hardware in NASA JSC building 16 which could possibly be useful in the development of the ATB.

The survey is organized to show the hardware by laboratories. Most of the hardware in building 16 supports the Shuttle Avionics Integration Laboratory (SAIL); however, this hardware is contained in individual laboratories which, taken as a whole, make up the SAIL. In some cases, individual elements of SAIL are identified as Simulations which may contain more than one laboratory. These elements are fully identified down to the laboratory level. The hardware in building 16 which is not a part of SAIL is contained in identifiable working laboratories and is described in that manner.

Since computer systems are versatile tools which may be reconfigured to do different or additional tasks, they are listed separately for each laboratory on a special form. The computer systems as listed can only be assumed correct at the time of the survey. Changing laboratory requirements may cause equipment to be moved to different systems within the laboratory and, in some cases, to systems in another laboratory. This survey does not address the availability of this hardware for use in the ATB.
2. DATA SYSTEMS LABORATORY

The Data Systems Laboratory is used for the following functions:

- Investigation of Shuttle avionics systems problems
- Development and evaluation of breadboard hardware for Shuttle enhancements
- Support for SAIL testing

The major hardware elements in the Data Systems Laboratory are the ten (10) computer systems detailed on pages A-1 through A-10.
3. POWER DISTRIBUTION AND CONTROL LABORATORY (PDCL)

The PDCL is used to support tests involving the Shuttle Electrical Power Distribution and Control (EPDC) system and tests involving other spacecraft power systems such as the Power Extension Package (PEP). The PDCL supports the following test functions:

- Development testing
- Anomaly investigations
- Evaluation of proposed EPDC modifications
- Verification of engineering and mathematical calculations

The primary hardware elements in the PDCL are the Shuttle EPDC breadboard and the two computer systems detailed on pages A-11 and A-12.
4. INERTIAL SYSTEMS LABORATORY

The Inertial Systems Laboratory is used to support evaluations and tests involving spacecraft Inertial Measurement Units (IMUs), Star Trackers, and Rate Gyro Assemblies (RGAs). In addition to subsystem tests, this laboratory supports the system tests performed with the Shuttle Test Station (STS) in the SAIL. The primary hardware elements in the Inertial Systems Laboratory are the 3-axis Dynamics Motion Simulator (DMS), a 2-axis rate table, and the five computer systems detailed on pages A-13 through A-17.
5. INERTIAL COMPONENTS LABORATORY

The Inertial Components Laboratory is used to evaluate spacecraft inertial components. Its major hardware elements are three rate tables, three dividing heads, and a computer system detailed on page A-18.
6. FLIGHT CONTROLS LABORATORY

The Flight Controls Laboratory is used to evaluate spacecraft flight control hardware such as electromechanical actuators and Orbital Maneuvering System (OMS) actuators. The primary hardware element in this laboratory is the computer system detailed on page A-19.
7. SHUTTLE AVIONICS INTEGRATION LABORATORY (SAIL)

The SAIL is composed of three major systems - two Test Stations and their supporting laboratories and a Shuttle Engineering Simulator (SES). The two test stations are the Shuttle Test Station (STS) and the Guidance, Navigation and Control Test Station (GTS). Each of these Test Stations have dedicated support laboratories and share the use of some laboratories. The SES will be considered as one laboratory even though its equipment is located in two noncontiguous rooms and it shares a computer system with another laboratory in another room.

7.1 SHUTTLE TEST STATION (STS)

The STS contains the following hardware:

- A mockup of the fore and aft flight deck cockpit
- Qualifiable Shuttle avionics hardware
- Selected Shuttle avionics and non-avionics line replaceable units based on providing complete interface with flight software, flight deck display and control, and selected Launch Processing System application software
- A representative mockup of the Shuttle avionics bay and payload bay
- A Shuttle flight type wiring harness
- A standard payload interface
- SAIL Aerosurface Actuator Simulator (SAAS)
- Navigational Aids Test Set (NTS)

The laboratories listed below are used by the STS to support tests. All the laboratories are part of SAIL.

- Test Operation Center (TOC)
- Marshall Mated Element Simulator (MMES)
- Launch Processing System (LPS)
- Shuttle Avionics Test System (SATS)
- Payload Acceptance Test Station (PATS)
- Verification Test Station (VTS)
- Quick Look Station (QLS)
- Applications Verification Laboratory (AVL)
- Shuttle Dynamics Simulator (SDS)
- Electronic Visual Display (EVD)
- Software Development Laboratory

7.1.1 TEST OPERATIONS CENTER (TOC)

The Test Operations Center supports testing with the Shuttle Test Station. It provides such functions as test control, test interface control, data display and storage, and fault insertion. The TOC contains the following hardware:

- Video data monitors
- Close circuit television monitors
- Analog recorders
- Control stations containing four META 4 computer systems

7.1.2 MARSHALL MATED ELEMENTS SIMULATOR (MMES)

The MMES is used to support tests with the Shuttle Test Station and the Guidance, Navigation and Control Test Station. The MMES provides simulations of the Shuttle main engines, the Shuttle solid rocket booster (SRB) engines, the thrust vector control actuators, and other Shuttle hardware functions. The primary hardware element in the MMES is the XEROX 560 computer system detailed on page B-1. Other hardware elements include a test control console and a signal conditioning unit.
7.1.3 LAUNCH PROCESSING SYSTEM (LPS)

The LPS laboratory is used to support tests with the Shuttle Test Station and the Guidance, Navigation and Control Test Station. The LPS provides data recording, data display, and test control functions. The primary hardware in the LPS is six video monitor/control stations and the seven supporting computer systems detailed on pages B-2 through B-8.

7.1.4 SHUTTLE AVIONICS TEST SYSTEM (SATS)

The SATS is used to support tests with the Shuttle Test Station and the Guidance, Navigation and Control Test Station. It provides data recording and data reduction functions. The primary hardware elements in the SATS are the Data General NOVA 840 and the Data General Eclipse C350 computer systems detailed on pages B-9 and B-10.

7.1.5 PAYLOAD ACCEPTANCE TEST STATION (PATS)

The PATS supports testing with the Shuttle Test Station. The PATS can simulate the Shuttle flight system for testing payloads and payload interfaces, or it can simulate the payload interfaces to support flight system tests. The primary hardware element in the PATS is the SEL 32/75 computer system detailed on page B-11.

7.1.6 VERIFICATION TEST STATION (VTS)

The VTS is used for real time recording and near real time display of user selected SAIL downlist, simulation, and flight system parameters after a preselected event during a SAIL test sequence with the STS or GTS. Data may also be dumped on a printer immediately after capture to give test personnel a quick look at test parameters. The major hardware item in the VTS is the computer system detailed on page B-12.

7.1.7 QUICK LOOK STATION (QLS)

The Quick Look Station is used for non-real time SAIL activities such as maintenance of the SAIL data base for TOC, data reduction of data recorded
in other SAIL laboratories, Configuration Management Office (CMO) records and activities, and logic card wire list generation. The major hardware element in the QLS is the computer configuration detailed on page B-13.

7.1.8 APPLICATIONS VERIFICATION LABORATORY (AVL)

The AVL is used to develop system software for the Test Operations Center (TOC) and as a test bed to check out TOC META 4 computer system components. Major hardware elements in the AVL are a Display and Control Module (DCM), an Acquisition and Command Module (ACM) and the META 4 computer system detailed on page B-14.

7.1.9 SHUTTLE DYNAMICS SIMULATOR (SDS)

The Shuttle Dynamics Simulator is used to support testing with the Shuttle test Station. This simulator contains three laboratories - the Vehicle Dynamics Simulation (VDS), the Simulator Recorder Subsystem (SRS), and the Simulator Interface Subsystem (SIS). These laboratories will be described individually. In addition to these three laboratories, the SDS contains an RCS/OHMS Simulator (ROS) and an MMES Buffer, and it receives test support from the Electronic Visual Display (EVD) laboratory and the Software Development Laboratory. The EVD and Software Development Laboratory will be described as separate SAIL laboratories.

7.1.9.1 Vehicle Dynamics Simulation (VDS)

The VDS laboratory provides simulations of Shuttle aerodynamics, flight dynamics, sensors, navigational aids, IMUs, propulsive forces, moments, and remote manipulator systems. The major hardware elements in the VDS laboratory are the five computer systems detailed on pages B-15 through B-19.

7.1.9.2 Simulator Recorder Subsystem (SRS)

The SRS provides a real time magnetic tape recording capability for recording data from the VDS, SIS, and other SAIL/STS elements. The major hardware element in the SRS is the computer system detailed on page B-20.
7.1.9.3 Simulation Interface Subsystem (SIS)

The SIS provides the interface hardware between the Shuttle Test Station and the VDS and SRS. Its major hardware elements include the Signal Conditioning System, the Converter System, the Test and Monitor Unit, the Buffer Amplifier and Trunking System, and the Raytheon R704 computer system detailed on page B-21.

7.1.10 ELECTRONIC VISUAL DISPLAY (EVD)

The EVD laboratory supplies simulated out-the-window scenes and CCTV scenes in color for all three of the major SAIL systems - STS, GTS, and SES. In addition, it contains a graphics system with an electronic tablet for graphics projects. Its major hardware elements are an Evans and Sutherland Scene Generator, a General Electric Scene Generator, and five computer systems which are detailed on pages B-22 through B-26.

7.1.11 SOFTWARE DEVELOPMENT LABORATORY

The Software Development Laboratory is used by personnel in SDS, GDS, and SES to develop applications programs for the computers in those areas. The major hardware elements in the laboratory are the two computer systems detailed on pages B-27 and B-28, and two Intel microprocessor development systems (MDS 800 and MDS 230).

7.2 GUIDANCE, NAVIGATION AND CONTROL TEST STATION (GTS)

The GTS contains the following hardware:

- A mockup of the Shuttle forward cockpit
- Qualifiable/prototype Shuttle avionics hardware
- Selected Shuttle avionics and non-avionics line replaceable units to provide interface with flight software and flight deck display and control for Guidance, Navigation and Control functions
- Non-flight wire harness and LRU mounting racks
The laboratories listed below are used by the GTS to support tests. All the laboratories are part of SAIL. Four of the laboratories are used by more than one major SAIL system and have been described in paragraph 7.1. The GTS Dynamics Simulator is dedicated to the GTS and is described in the following paragraphs. These laboratories support GTS testing:

- Marshall Mated Element Simulator (MMES)
- Launch Processing System (LPS)
- Shuttle Avionics Test Set (SATS)
- Electronics Visual Display (EVD)
- GTS Dynamics Simulator (GDS)

7.2.1 GTS DYNAMICS SIMULATOR (GDS)

The GDS is used to support testing with the Guidance, Navigation and Control Test Station. This simulator contains three laboratories - the Flight Dynamics Simulation (FDS), the GTS Recording Device (GRD), and the GTS Simulation Interface (GSI). These laboratories will be described individually in the following paragraphs. In addition to these three laboratories, the GDS contains an RCS/OHMS Simulator (ROS), an MMES Buffer, and a Non-Avionics Simulator detailed on page B-29, and it receives support from the Electronic Visual Display (EVD) laboratory. The EVD was described in paragraph 7.1.10.

7.2.1.1 Flight Dynamics Simulation (FDS)

The FDS laboratory provides simulations of Shuttle aerodynamics, flight dynamics, sensors, navigational aids, IMUs, propulsive forces, moments, and remote manipulator systems. The major hardware elements in the FDS laboratory are the five computer systems detailed on pages B-30 through B-34.

7.2.1.2 GTS Recording Device (GRD)

The GRD provides a real-time magnetic tape recording capability for recording data from the FDS, GSI, and other SAIL/GTS elements. The major hardware element in the GRD is the computer system detailed on page B-35.
7.2.1.3 GTS Simulation Interface (GSI)

The GSI provides the interface hardware between the Guidance, Navigation and Control Test Station and the FDS and GRD. Its major hardware elements include the Signal Conditioning System, the Converter System, the Test and Monitor Unit, the Buffer Amplifier and Trunking System, and the Raytheon 704 computer system detailed on page B-36.

7.3 SHUTTLE ENGINEERING SIMULATOR (SES)

The Shuttle Engineering Simulator provides the capability of performing Shuttle engineering simulations without any flight type hardware. There are mockups of the forward and aft cockpit crew stations for use in the simulations; however, none of the hardware is flight type hardware. In addition to the cockpits, the major hardware elements are the SES Cockpit Interface (SCI) and the 12 computer systems detailed on pages B-37 through B-48. The SES uses the EVD laboratory described in paragraph 7.1.10 for out-the-window scenes and CCTV displays.
APPENDIX A
COMPUTER SYSTEMS
NASANSC COMPUTER SURVEY

Computer Manufacturer: SEL
Model: SEL 32/55
System Laboratory Use: Data Systems
NASA Branch: EH4

MAIN MEMORY:
Word Size: 32 Bits
Memory Capacity: 128K Words
Cycle Time: 0.6 Microseconds

MASS MEMORY:
Magnetic Tape: 2 ea. 9T 75IPS units at 800 bpi
Hard Disk Capacity: 3 ea. 10M bytes
Floppy Disk: -- units

LOCATION OF COMPUTER:
Building 16A, Room 2012

GENERAL PERIPHERALS:
Line Printer(s): 1 ea. 600 LPM
Card Reader: 1 ea. 1000 CPM
Card Punch: --
CRT Terminals: 4 ea. Units
Graphic Terminals: -- Units
Color Graphic Terminals: 1 ea. RAMTEK 6200R Units

SPECIAL H/W ARITHMETIC:
Mul/Div: (Firmware)
Floating Point: (Firmware)
Array Processor: --

ADDITIONAL PERIPHERALS:
Silent 700 Printer/Keyboard: ASR35 Teletype

AVAILABLE SOFTWARE:
Operating Systems(s) Description: SEL Real Time Monitor 7.1
Compilers/Languages: Fortran, Basic
Application S/W: Cross assemblers for 6800, 68000, 8085, 6502 and 9900 microprocessors; automatic wirewrap program
Computer Manufacturer: Data General  Model: NOVA 4
System Laboratory Use: Data Systems  NASA Branch: EH4

MAIN MEMORY:
Word Size: 16 Bits
Memory Capacity: 128K Words
Cycle Time: 0.4 Microseconds

MASS MEMORY:
Magnetic Tape: 2 ea. 9T 75IPS units at 800 bpi
1 ea. C7 75IPS units at 800/1600 bpi
Hard Disk Capacity: 2 ea. 10M bytes
Floppy Disk: 2 ea. 8 inch units

LOCATION OF COMPUTER:
Building 16A, Room 2012
Network Interface Type: --

GENERAL PERIPHERALS:
Line Printer(s): 1 ea. 300 LPM
Card Reader: 1 ea. 600 CPM
Card Punch: --
CRT Terminals: 2 ea. Units
Graphic Terminals: 2 ea. (See below) Units
Color Graphic Terminals: -- Units

SPECIAL H/W ARITHMETIC:
Mul/Div: Yes
Floating Point: Yes
Array Processor: --

ADDITIONAL PERIPHERALS:
2 ea. 4002A graphic terminals, paper tape reader/punch

AVAILABLE SOFTWARE:
Operating Systems(s) Description: MRDOS
Compilers/Languages: Fortran IV, Fortran V, Algol 68, Basic
Application S/W: Cross assemblers for 8000 series Intel microprocessors, 9440 development
<table>
<thead>
<tr>
<th><strong>Computer Manufacturer:</strong></th>
<th>Data General</th>
<th><strong>Model:</strong> NOVA 1200</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>System Laboratory Use:</strong></td>
<td>Data Systems</td>
<td>NASA Branch: EH4</td>
</tr>
</tbody>
</table>

**MAIN MEMORY:**
- **Word Size:** 16 Bits
- **Memory Capacity:** 32K Words
- **Cycle Time:** 1.2 Microseconds

**MASS MEMORY:**
- **Magnetic Tape:**
  - 1 ea. 9T 75IPS units at 800/1600 bpi
  - units at bpi
- **Hard Disk Capacity:** 2 ea. 5M bytes
- **Floppy Disk:** -- units

**LOCATION OF COMPUTER:**
- Building 16A, Room 2012
- Network Interface Type: --

**GENERAL PERIPHERALS:**
- **Line Printer(s):** 1 ea. 300 LPM
- **Card Reader:** 1 ea. 300 CPM
- **Card Punch:** --
- **CRT Terminals:** 1 ea. Units
- **Graphic Terminals:** -- Units
- **Color Graphic Terminals:** -- Units

**SPECIAL H/W ARITHMETIC:**
- **Mul/Div:** Yes
- **Floating Point:** Yes
- **Array Processor:** No

**ADDITIONAL PERIPHERALS:**
- Paper tape reader/punch, triple cassette unit, touch terminal

**AVAILABLE SOFTWARE:**

**Operating Systems(s) Description:**

**Compilers/Languages:** Fortran IV, Basic

**Application S/W:**
Computer Manufacturer: Data General  
Model: NOVA 1200

System Laboratory Use: Data Systems  
NASA Branch: EH4

MAIN MEMORY:
Word Size: 16 Bits
Memory Capacity: 32K Words
Cycle Time: 1.2 Microseconds

MASS MEMORY:
Magnetic Tape: -- units at -- bpi
Magnetic Tape: -- units at -- bpi
Hard Disk Capacity: -- bytes
Floppy Disk: 2 ea. units

LOCATION OF COMPUTER:
Building 16A, Room 2012

Network Interface Type: --

GENERAL PERIPHERALS:
Line Printer(s): -- LPM
Card Reader: -- CPM
Card Punch: --
CRT Terminals: 1 ea. Units
Graphic Terminals: -- Units
Color Graphic Terminals: -- Units

SPECIAL H/W ARITHMETIC:
Mul/Div: Yes
Floating Point: Yes
Array Processor: No

ADDITIONAL PERIPHERALS:
Teletype

AVAILABLE SOFTWARE:
Operating Systems(s) Description:
Compilers/Languages: Fortran IV, Basic
Application S/W:
Computer Manufacturer: Data General  Model: NOVA 1200
System Laboratory Use: Data Systems  NASA Branch: EH4

**MAIN MEMORY:**
Word Size: 16 Bits
Memory Capacity: 28K Words
Cycle Time: 1.2 Microseconds

**MASS MEMORY:**
Magnetic Tape: Units at bpi
Hard Disk Capacity: -- bytes
Floppy Disk: -- units

**LOCATION OF COMPUTER:**
Building 16A, Room 2012

**GENERAL PERIPHERALS:**
Line Printer(s): -- LPM
Card Reader: -- CPM
Card Punch: --
CRT Terminals: -- Units
Graphic Terminals: -- Units
Color Graphic Terminals: -- Units

**SPECIAL H/W ARITHMETIC:**
Mul/Div: Yes
Floating Point: No
Array Processor: No

**ADDITIONAL PERIPHERALS:**
Teletype

**AVAILABLE SOFTWARE:**
Operating Systems(s) Description:
Compilers/Languages: Fortran IV, Basic
Application S/W:
Computer Manufacturer: Data General  
Model: NOVA 1200

System Laboratory Use: Data Systems  
NASA Branch: EH4

MAIN MEMORY:
Word Size: 16 Bits
Memory Capacity: 32K Words
Cycle Time: 1.2 Microseconds

MASS MEMORY:
Magnetic Tape: 

Hard Disk Capacity: -- bytes
Floppy Disk: -- units

LOCATION OF COMPUTER:
Building 16A, Room 2012

Network Interface Type: 

GENERAL PERIPHERALS:
Line Printer(s): LPM
Card Reader: CPM
Card Punch: 
CRT Terminals: Units
Graphic Terminals: Units
Color Graphic Terminals: Units

SPECIAL H/W ARITHMETIC:
Mul/Div: 
Floating Point: 
Array Processor: 

ADDITIONAL PERIPHERALS:
Paper tape punch, paper tape reader

AVAILABLE SOFTWARE:
Operating Systems(s) Description: 
Compilers/Languages: Fortran IV, Basic
Application S/W:
Computer Manufacturer: Data General
Model: NOVA 1200
System Laboratory Use: Data Systems
NASA Branch: EH4

MAIN MEMORY:
Word Size: 16 Bits
Memory Capacity: Words
Cycle Time: 1.2 Microseconds

MASS MEMORY:
Magnetic Tape: units at bpi
units at bpi
Hard Disk Capacity: -- bytes
Floppy Disk: -- units

LOCATION OF COMPUTER:
Building 16A, Room 2012

GENERAL PERIPHERALS:
Line Printer(s): LPM
Card Reader: CPM
Card Punch: --
CRT Terminals: -- Units
Graphic Terminals: -- Units
Color Graphic Terminals: -- Units

SPECIAL H/W ARITHMETIC:
Mul/Div: Yes
Floating Point: Yes
Array Processor: No

ADDITIONAL PERIPHERALS:

AVAILABLE SOFTWARE:
Operating Systems(s) Description:
Compilers/Languages: Fortran IV, Basic
Application S/W:
Computer Manufacturer: Data General  
Model: NOVA 1200
System Laboratory Use: Data Systems  
NASA Branch: EH4

MAIN MEMORY:
Word Size: 16 Bits
Memory Capacity: 16K Words
Cycle Time: 1.2 Microseconds

MASS MEMORY:
Magnetic Tape: units at bpi
Hard Disk Capacity: bytes
Floppy Disk: units

LOCATION OF COMPUTER:
Building 16A, Room 2012

GENERAL PERIPHERALS:
Line Printer(s): -- LPM
Card Reader: -- CPM
Card Punch:  
CRT Terminals: -- Units
Graphic Terminals: -- Units
Color Graphic Terminals: -- Units

SPECIAL H/W ARITHMETIC:
Mul/Div: 
Floating Point: 
Array Processor: 

ADDITIONAL PERIPHERALS:

AVAILABLE SOFTWARE:
Operating Systems(s) Description:
Compilers/Languages: Fortran IV, Basic
Application S/W:
Computer Manufacturer: Data General  Model: NOVA 1200
System Laboratory Use: Data Systems  NASA Branch: EH4

MAIN MEMORY:
Word Size: 16 Bits
Memory Capacity: ___________ Words
Cycle Time: ______________Microseconds

MASS MEMORY:
Magnetic Tape: ___________ units at ___________ bpi
Hard Disk Capacity: ___________ bytes
Floppy Disk: ___________ units

LOCATION OF COMPUTER:
Building 16A, Room 2012
Network Interface Type: ---

GENERAL PERIPHERALS:
Line Printer(s): ___________ LPM
Card Reader: ___________ CPM
Card Punch: ___________
CRT Terminals: ___________ Units
Graphic Terminals: ___________ Units
Color Graphic Terminals: ___________ Units

SPECIAL H/W ARITHMETIC:
Mul/Div: ___________
Floating Point: ___________
Array Processor: ___________

ADDITIONAL PERIPHERALS:

AVAILABLE SOFTWARE:
Operating Systems(s) Description: 

Compilers/Languages: Fortran IV, Basic

Application S/W: 

A-9
Computer Manufacturer: Data General  
System Laboratory Use: Data Systems  
Model: NOVA 1200  
NASA Branch: EH4  

MAIN MEMORY:
Word Size: 16 Bits  
Memory Capacity: 12K Words  
Cycle Time: 1.2 Microseconds  

MASS MEMORY:
Magnetic Tape: -- units at -- bpi  
Hard Disk Capacity: -- bytes  
Floppy Disk: -- units  

LOCATION OF COMPUTER:
Building 16A, Room 2012  
Network Interface Type: --  

GENERAL PERIPHERALS:
Line Printer(s): -- LPM  
Card Reader: -- CPM  
Card Punch: --  
CRT Terminals: -- Units  
Graphic Terminals: -- Units  
Color Graphic Terminals: -- Units  

SPECIAL H/W ARITHMETIC:
Mul/Div: --  
Floating Point: --  
Array Processor: --  

ADDITIONAL PERIPHERALS:

AVAILABLE SOFTWARE:
Operating Systems(s) Description:  
Compilers/Languages: Fortran IV, Basic  
Application S/W:  

A-10
## NASA/JSC COMPUTER SURVEY

**Computer Manufacturer:** Data General  
**Model:** NOVA 4

**System Laboratory Use:** EPDC  
**NASA Branch:** EH5

### MAIN MEMORY:
- **Word Size:** 16 Bits
- **Memory Capacity:** 128K Words
- **Cycle Time:** 0.4 Microseconds

### MASS MEMORY:
- **Magnetic Tape:** 1 ea. 9T 75IPS units at 800 bpi
  - units at bpi
- **Hard Disk Capacity:** 1 ea. 10M bytes
- **Floppy Disk:** 1 ea. units

### LOCATION OF COMPUTER:
- **Building:** 16  
  **Room:** 185

### GENERAL PERIPHERALS:
- **Line Printer(s):** 600 LPM
- **Card Reader:** 600 CPM
- **Card Punch:** --
- **CRT Terminals:** 3 ea. Units
- **Graphic Terminals:** 1 ea. Units
- **Color Graphic Terminals:** -- Units

### SPECIAL H/W ARITHMETIC:
- **Mul/Div:** Yes
- **Floating Point:** Yes
- **Array Processor:** --

### ADDITIONAL PERIPHERALS:
- Terminal/Printer, ULM5 Terminal Multiplexer

### AVAILABLE SOFTWARE:
- **Operating Systems(s) Description:** MRDOS
- **Compilers/Languages:** Fortran IV, Fortran V, Algol 68, Basic
- **Application S/W:** Graphics Plotting System, Laboratory Data Monitor and Acquisition System

A-11
Computer Manufacturer: WANG         Model: 2200T-8
System Laboratory Use: EPDC         NASA Branch: EH5

MAIN MEMORY:
Word Size:  24  Bits
Memory Capacity:  32K  Words
Cycle Time:  6.0  Microseconds

MASS MEMORY:
Magnetic Tape:  --  units at  bpi
--  units at  bpi
Hard Disk Capacity:  --  bytes
Floppy Disk:  1 ea.  units

LOCATION OF COMPUTER:
Building  16, Room  184

GENERAL PERIPHERALS:
Line Printer(s):  90  LPM
Card Reader:  --  CPM
Card Punch:  --
CRT Terminals:  1 ea.  Units
Graphic Terminals:  --  Units
Color Graphic Terminals:  --  Units

SPECIAL H/W ARITHMETIC:
Mul/Div:  --
Floating Point:  --
Array Processor:  --

ADDITIONAL PERIPHERALS:
Data Acquisition System, Drum Plotter

AVAILABLE SOFTWARE:
Operating Systems(s) Description:

Compilers/Languages:  Basic

Application S/W:  Data Acquisition Operating Program
NASA/JSC COMPUTER SURVEY

Computer Manufacturer: Hewlett Packard  Model: HP 21MX
System Laboratory Use: Inertial Systems Lab NASA Branch: EH6

MAIN MEMORY:
Word Size: 16 Bits
Memory Capacity: 32K Words
Cycle Time: 1.2 Microseconds

MASS MEMORY:
Magnetic Tape: 1 ea. 9T units at 800 bpi
Hard Disk Capacity: 5M bytes
Floppy Disk: -- units

LOCATION OF COMPUTER:
Building 16, Room 1054

GENERAL PERIPHERALS:
Line Printer(s): -- LPM
Card Reader: -- CPM
Card Punch: --
CRT Terminals: 1 ea. Units
Graphic Terminals: -- Units
Color Graphic Terminals: -- Units

SPECIAL H/W ARITHMETIC:
Mul/Div: Yes
Floating Point: Yes
Array Processor: No

ADDITIONAL PERIPHERALS:
HP 2635 Printer/Terminal

AVAILABLE SOFTWARE:
Operating Systems(s) Description: RTE II
Compilers/Languages: Fortran, Basic
Application S/W: IMU Calibration
NASA/JSC COMPUTER SURVEY

Computer Manufacturer:  **Hewlett Packard**  
Model:  **HP 21MX**  
System Laboratory Use:  **Inertial Systems Lab**  
NASA Branch:  **EH6**  

### MAIN MEMORY:
- **Word Size:** 16 Bits
- **Memory Capacity:** 32K Words
- **Cycle Time:** 1.2 Microseconds

### MASS MEMORY:
- **Magnetic Tape:** 1 ea. 9T units at 800 bpi
- **Hard Disk Capacity:** 5M bytes
- **Floppy Disk:** -- units

### LOCATION OF COMPUTER:
- **Building:** 16, **Room:** 1054
- **Network Interface Type:** --

### GENERAL PERIPHERALS:
- **Line Printer(s):** LPM
- **Card Reader:** CPM
- **Card Punch:** --
- **CRT Terminals:** 1 ea. Units
- **Graphic Terminals:** -- Units
- **Color Graphic Terminals:** -- Units

### SPECIAL H/W ARITHMETIC:
- **Mul/Div:** Yes
- **Floating Point:** Yes
- **Array Processor:** No

### ADDITIONAL PERIPHERALS:
- **Paper Tape Reader, HP 2635 Terminal/Printer**

### AVAILABLE SOFTWARE:
- **Operating Systems(s) Description:** RTE II
- **Compilers/Languages:** Fortran, Basic
- **Application S/W:** IMU Calibration
**NASA/JSC COMPUTER SURVEY**

**Computer Manufacturer:** Hewlett Packard  
**Model:** HP 2100  
**System Laboratory Use:** Inertial Systems Lab  
**NASA Branch:** EH6

**MAIN MEMORY:**
- **Word Size:** 16 Bits
- **Memory Capacity:** 32K Words
- **Cycle Time:** 1.2 Microseconds

**MASS MEMORY:**
- **Magnetic Tape:** -- units at ____ bpi
- -- units at ____ bpi
- **Hard Disk Capacity:** 2.5M bytes
- **Floppy Disk:** -- units

**LOCATION OF COMPUTER:**
- **Building:** 16  
- **Room:** 1054

**Network Interface Type:** --

**GENERAL PERIPHERALS:**
- **Line Printer(s):** 1 ea. LPM
- **Card Reader:** -- CPM
- **Card Punch:** --
- **CRT Terminals:** 1 ea. Units
- **Graphic Terminals:** -- Units
- **Color Graphic Terminals:** -- Units

**SPECIAL H/W ARITHMETIC:**
- **Mul/Div:** Yes
- **Floating Point:** Yes
- **Array Processor:** No

**ADDITIONAL PERIPHERALS:**
- Paper Tape Reader, Paper Tape Punch, Teletype

**AVAILABLE SOFTWARE:**
- **Operating Systems(s) Description:** RTE II
- **Compilers/Languages:** Fortran, Basic
- **Application S/W:** IMU Calibration

---

A-15
Computer Manufacturer: Hewlett Packard
Model: HP 2100
System Laboratory Use: Inertial Systems Lab
NASA Branch: EH6

MAIN MEMORY:
Word Size: 16 Bits
Memory Capacity: 32K Words
Cycle Time: 1.2 Microseconds

MASS MEMORY:
Magnetic Tape: units at bpi
Hard Disk Capacity: 2.5M bytes
Floppy Disk: units

LOCATION OF COMPUTER:
Building 16, Room 1054
Network Interface Type:

GENERAL PERIPHERALS:
Line Printer(s): 1 ea. LPM
Card Reader: CPM
Card Punch:
CRT Terminals: 1 ea. Units
Graphic Terminals: Units
Color Graphic Terminals: Units

SPECIAL H/W ARITHMETIC:
Mul/Div: Yes
Floating Point: Yes
Array Processor: No

ADDITIONAL PERIPHERALS:
Paper Tape Reader, Paper Tape Punch, Teletype

AVAILABLE SOFTWARE:
Operating Systems(s) Description: RTE II
Compilers/Languages: Fortran, Basic
Application S/W: IMU Calibration
NASA/JSC COMPUTER SURVEY

Computer Manufacturer: Hewlett Packard  Model: HP 2100
System Laboratory Use: Inertial Systems Lab  NASA Branch: EH6

MAIN MEMORY:
Word Size: 16 Bits
Memory Capacity: 32K Words
Cycle Time: 1.2 Microseconds

MASS MEMORY:
Magnetic Tape: units at bpi
Hard Disk Capacity: 2.5M bytes
Floppy Disk: units

LOCATION OF COMPUTER:
Building 16, Room 1054

Network Interface Type: --

GENERAL PERIPHERALS:
Line Printer(s): 1 ea. LPM
Card Reader: CPM
Card Punch: --
CRT Terminals: 1 ea. Units
Graphic Terminals: 1 ea. Units
Color Graphic Terminals: -- Units

SPECIAL H/W ARITHMETIC:
Mul/Div: Yes
Floating Point: Yes
Array Processor: --

ADDITIONAL PERIPHERALS:
Paper Tape Reader, Paper Tape Punch, Teletype

AVAILABLE SOFTWARE:
Operating Systems(s) Description: RTE II

Compilers/Languages: Fortran, Basic

Application S/W: IMU Calibration

A-17
Computer Manufacturer: Hewlett Packard  
Model: HP 1000

System Laboratory Use: Inertial Components  
NASA Branch: EH6

**MAIN MEMORY:**
Word Size: 16 Bits
Memory Capacity: 128K Words
Cycle Time: 0.5 Microseconds

**MASS MEMORY:**
Magnetic Tape: -- units at -- bpi
Hard Disk Capacity: -- bytes
Floppy Disk: 2 units

**LOCATION OF COMPUTER:**
Building 16A, Room 1043

**Network Interface Type:** IEEE 488

**GENERAL PERIPHERALS:**
Line Printer(s): 90 LPM
Card Reader: -- CPM
Card Punch: --
CRT Terminals: -- Units
Graphic Terminals: 1 Units
Color Graphic Terminals: -- Units

**SPECIAL H/W ARITHMETIC:**
Mul/Div: Yes
Floating Point: Yes
Array Processor: --

**ADDITIONAL PERIPHERALS:**
Analog Scanner-20 Channels

**AVAILABLE SOFTWARE:**
Operating Systems(s) Description: RTE
Compilers/Languages: Fortran IV
Application S/W: Gyro Test Programs

A-18
Computer Manufacturer: Hewlett Packard	 Model: HP1000
System Laboratory Use: Flight Controls Lab	 NASA Branch: EH6

MAIN MEMORY:
Word Size: 16 Bits
Memory Capacity: 256K Words
Cycle Time: 0.5 Microseconds

MASS MEMORY:
Magnetic Tape: -- units at __________ bpi
-- units at __________ bpi
Hard Disk Capacity: 20M bytes
Floppy Disk: -- units

LOCATION OF COMPUTER:
Building 16A, Room 1047

Network Interface Type: IEEE 488

GENERAL PERIPHERALS:
Line Printer(s): 1200 LPM
Card Reader: 300 CPM
Card Punch: --
CRT Terminals: 1 Units
Graphic Terminals: -- Units
Color Graphic Terminals: -- Units

SPECIAL H/W ARITHMETIC:
Mul/Div: Firmware
Floating Point: Firmware
Array Processor: --

ADDITIONAL PERIPHERALS:
Teletype ASR33, HP2635 Printing Terminal, Paper Tape Punch/Reader,
32 Channels of A/D, 20 Channels of D/A

AVAILABLE SOFTWARE:
Operating Systems(s) Description: RTE4 A
Compilers/Languages: Fortran, Basic
Application S/W: Dynamics System Simulation
Computer Manufacturer: XEROX       Model: 560
System Laboratory Use: MMES/SAIL       NASA Branch: __________

MAIN MEMORY:
Word Size: 32 Bits
Memory Capacity: 200K Words
Cycle Time: __________ Microseconds

MASS MEMORY:
Magnetic Tape: 3 units at 1600 bpi
________ units at __________ bpi
Hard Disk Capacity: __________ bytes
Floppy Disk: __________ units

LOCATION OF COMPUTER:
Building 16, Room 2046
Network Interface Type: N/A

GENERAL PERIPHERALS:
Line Printer(s): LPM
Card Reader: CPM
Card Punch: N/A
CRT Terminals: 3 Units
Graphic Terminals: 2 Units
Color Graphic Terminals: 1 Units

SPECIAL H/W ARITHMETIC:
Mul/Div: __________
Floating Point: __________
Array Processor: __________

ADDITIONAL PERIPHERALS:
Teletype

AVAILABLE SOFTWARE:
Operating Systems(s) Description: __________
Compilers/Languages: Fortran IV, Basic
Application S/W: Shuttle Mated Elements Simulations

Computer Manufacturer: MODCOMP
Model: __________________
System Laboratory Use: LPS
NASA Branch: ________________

MAIN MEMORY:
Word Size: __________ 16 Bits
Memory Capacity: __________ Words
Cycle Time: ________________ Microseconds

MASS MEMORY:
Magnetic Tape: -- _______ units at _________ bpi
-- _______ units at _________ bpi
Hard Disk Capacity: 2 ea. _________ bytes
Floppy Disk: -- _______ units

LOCATION OF COMPUTER:
Building ____________, Room ___________
Network Interface Type: __________________

GENERAL PERIPHERALS:
Line Printer(s): ________________ LPM
Card Reader: ________________ CPM
Card Punch: ________________
CRT Terminals: ________________ Units
Graphic Terminals: ________________ Units
Color Graphic Terminals: ________________ Units

SPECIAL H/W ARITHMETIC:
Mul/Div: __________________
Floating Point: __________________
Array Processor: __________________

ADDITIONAL PERIPHERALS:
______________________________

AVAILABLE SOFTWARE:
Operating Systems(s) Description:
Compilers/Languages:
Application S/W:
Computer Manufacturer: MODCOMP  
Model:  
System Laboratory Use: LPS  
NASA Branch:  

**MAIN MEMORY:**
- Word Size: 16 Bits
- Memory Capacity:  
- Cycle Time:  

**MASS MEMORY:**
- Magnetic Tape:  
  - units at  bpi
  - units at  bpi
- Hard Disk Capacity: 2 ea. bytes
- Floppy Disk:  

**LOCATION OF COMPUTER:**
- Building 16, Room 194

**GENERAL PERIPHERALS:**
- Line Printer(s): 1 ea. LPM
- Card Reader: 1 ea. CPM
- Card Punch:  
- CRT Terminals:  Units
- Graphic Terminals:  Units
- Color Graphic Terminals:  Units

**SPECIAL H/W ARITHMETIC:**
- Mul/Div:  
- Floating Point:  
- Array Processor:  

**ADDITIONAL PERIPHERALS:**

**AVAILABLE SOFTWARE:**
- Operating Systems(s) Description:  
- Compilers/Languages:  
- Application S/W:  

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B-3
Computer Manufacturer: MODCOMP
Model: 
System Laboratory Use: LPS
NASA Branch: 

MAIN MEMORY:
Word Size: 16
Bits
Memory Capacity: 
Words
Cycle Time: 
Microseconds

MASS MEMORY:
Magnetic Tape: 3 ea. 
units at 
bpi

Hard Disk Capacity: 2 ea. 
bytes
Floppy Disk:

LOCATION OF COMPUTER:
Building 16, Room 194

Network Interface Type: 

GENERAL PERIPHERALS:
Line Printer(s): LPM
Card Reader: CPM
Card Punch:

CRT Terminals: Units
Graphic Terminals: Units
Color Graphic Terminals: Units

SPECIAL H/W ARITHMETIC:
Mul/Div:
Floating Point:
Array Processor:

ADDITIONAL PERIPHERALS:

AVAILABLE SOFTWARE:
Operating Systems(s) Description:
Compilers/Languages:
Application S/W:
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<th><strong>Computer Manufacturer:</strong></th>
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<th><strong>Model:</strong></th>
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<tr>
<td><strong>System Laboratory Use:</strong></td>
<td>LPS</td>
<td><strong>NASA Branch:</strong></td>
<td></td>
</tr>
</tbody>
</table>

**MAIN MEMORY:**
- **Word Size:** 16 Bits
- **Memory Capacity:** [Number] Words
- **Cycle Time:** [Number] Microseconds

**MASS MEMORY:**
- **Magnetic Tape:** [Number] Units at [Number] bpi
- **Hard Disk Capacity:** [Number] bytes
- **Floppy Disk:** [Number] Units

**LOCATION OF COMPUTER:**
- **Building:** 16, **Room:** 194
- **Network Interface Type:**

**GENERAL PERIPHERALS:**
- **Line Printer(s):** LPM
- **Card Reader:** CPM
- **Card Punch:**
- **CRT Terminals:** [Number] Units
- **Graphic Terminals:** [Number] Units
- **Color Graphic Terminals:** [Number] Units

**SPECIAL H/W ARITHMETIC:**
- **Mul/Div:**
- **Floating Point:**
- **Array Processor:**

**ADDITIONAL PERIPHERALS:**

**AVAILABLE SOFTWARE:**
- **Operating Systems(s) Description:**
- **Compilers/Languages:**
- **Application S/W:**
Computer Manufacturer: MODCOMP Model: __________
System Laboratory Use: LPS NASA Branch: __________

MAIN MEMORY:
Word Size: _______ 16 Bits
Memory Capacity: __________ Words
Cycle Time: __________ Microseconds

MASS MEMORY:
Magnetic Tape: __________ units at __________ bpi
__________ units at __________ bpi
Hard Disk Capacity: __________ bytes
Floppy Disk: __________ units

LOCATION OF COMPUTER:
Building _________, Room _________
Network Interface Type: __________________________

GENERAL PERIPHERALS:
Line Printer(s): __________ LPM
Card Reader: __________ CPM
Card Punch: __________________________
CRT Terminals: __________ Units
Graphic Terminals: __________ Units
Color Graphic Terminals: __________ Units

SPECIAL H/W ARITHMETIC:
Mul/Div: __________________________
Floating Point: ______________________
Array Processor: _____________________

ADDITIONAL PERIPHERALS:


AVAILABLE SOFTWARE:
Operating Systems(s) Description: __________________________
Compilers/Languages: __________________________
Application S/W: __________________________
Computer Manufacturer: MODCOMP
Model: 
System Laboratory Use: LPS
NASA Branch: 

MAIN MEMORY:
Word Size: 16 Bits
Memory Capacity: Words
Cycle Time: Microseconds

MASS MEMORY:
Magnetic Tape: units at bpi
Hard Disk Capacity: bytes
Floppy Disk: units

LOCATION OF COMPUTER:
Building 16, Room 194

GENERAL PERIPHERALS:
Line Printer(s): LPM
Card Reader: CPM
Card Punch:
CRT Terminals: Units
Graphic Terminals: Units
Color Graphic Terminals: Units

SPECIAL H/W ARITHMETIC:
Mul/Div:
Floating Point:
Array Processor:

ADDITIONAL PERIPHERALS:

AVAILABLE SOFTWARE:
Operating Systems(s) Description:
Compilers/Languages:
Application S/W:
Computer Manufacturer: MODCOMP  
System Laboratory Use: LPS  
MAIN MEMORY:
Word Size: 16 Bits  
Memory Capacity: Words  
Cycle Time: Microseconds  
MASS MEMORY:
Magnetic Tape: units at bpi  
Hard Disk Capacity: bytes  
Floppy Disk: units  
LOCATION OF COMPUTER:
Building 16, Room 194  
Network Interface Type: CCAICDAI DCOMUCDAI C.  
Line Printer(s): LPM  
Card Reader: CPM  
CRT Terminals: Units  
Graphic Terminals: Units  
Color Graphic Terminals: Units  
SPECIAL H/W ARITHMETIC:
Mul/Div:  
Floating Point:  
Array Processor:  
AVAILABLE SOFTWARE:
Operating Systems(s) Description:  
Compilers/Languages:  
Application S/W:  

B-8
Computer Manufacturer: Data General
Model: NOVA 840
System Laboratory Use: SATS
NASA Branch: 

MAIN MEMORY:
Word Size: 16 Bits
Memory Capacity: Words
Cycle Time: Microseconds

MASS MEMORY:
Magnetic Tape: 2 ea, units at bpi
units at bpi
Hard Disk Capacity: bytes
Floppy Disk: units

LOCATION OF COMPUTER:
Building 16, Room 194
Network Interface Type: 

GENERAL PERIPHERALS:
Line Printer(s): LPM
Card Reader: CPM
Card Punch: 
CRT Terminals: Units
Graphic Terminals: Units
Color Graphic Terminals: Units

SPECIAL H/W ARITHMETIC:
Mul/Div: 
Floating Point: 
Array Processor: 

ADDITIONAL PERIPHERALS:

AVAILABLE SOFTWARE:
Operating Systems(s) Description: 
Compilers/Languages: 
Application S/W: 

B-9
Computer Manufacturer: Data General  Model: Eclipse C350
System Laboratory Use: SATS  NASA Branch: __________

MAIN MEMORY:
Word Size: ________ 16 Bits
Memory Capacity: ________________ Words
Cycle Time: ________________ Microseconds

MASS MEMORY:
Magnetic Tape: ________ 2 ea. units at ________ bpi
________ units at ________ bpi
Hard Disk Capacity: ________________ bytes
Floppy Disk: ________________ units

LOCATION OF COMPUTER:
Building ________ 16, Room ________ 194

Network Interface Type: ________________________________________________

GENERAL PERIPHERALS:
Line Printer(s): ________________ LPM
Card Reader: ________________ CPM
Card Punch: ________________
CRT Terminals: ________________ Units
Graphic Terminals: ________________ Units
Color Graphic Terminals: ________________ Units

SPECIAL H/W ARITHMETIC:
Mul/Div: ________________
Floating Point: ________________
Array Processor: ________________

ADDITIONAL PERIPHERALS:
_________________________________________________________________
_________________________________________________________________

AVAILABLE SOFTWARE:
Operating Systems(s) Description: ________________
Compilers/Languages: ________________
Application S/W: ________________
Computer Manufacturer: SEL  
Model: SEL 32/55
System Laboratory Use: PATS  
NASA Branch: 

MAIN MEMORY:
Word Size: 32 Bits
Memory Capacity: 128K Words
Cycle Time: 0.6 Microseconds

MASS MEMORY:
Magnetic Tape: 2 ea. 9T 75IPS units at 800/1600 bpi
Hard Disk Capacity: 300 M bytes
Floppy Disk: -- units

LOCATION OF COMPUTER:
Building 16, Room 194

GENERAL PERIPHERALS:
Line Printer(s): 1 ea., 900 LPM
Card Reader: 1 ea., 1000 CPM
Card Punch: --
CRT Terminals: 3 ea. Units
Graphic Terminals: -- Units
Color Graphic Terminals: -- Units

SPECIAL H/W ARITHMETIC:
Mul/Div: Firmware
Floating Point: Firmware
Array Processor: 

ADDITIONAL PERIPHERALS:

AVAILABLE SOFTWARE:
Operating Systems(s) Description: SEL Real Time Monitor
Compilers/Languages: Fortran
Application S/W:
### NASA/JSC COMPUTER SURVEY

<table>
<thead>
<tr>
<th>Computer Manufacturer:</th>
<th>SEL</th>
<th>Model:</th>
<th>SEL 32/55</th>
</tr>
</thead>
<tbody>
<tr>
<td>System Laboratory Use:</td>
<td>VTS</td>
<td>NASA Branch:</td>
<td></td>
</tr>
</tbody>
</table>

#### MAIN MEMORY:
- **Word Size:** 32 Bits
- **Memory Capacity:** 128K Words
- **Cycle Time:** 0.6 Microseconds

#### MASS MEMORY:
- **Magnetic Tape:** 3 ea. 9T 75IPS units at 800/1600 bpi
- **Hard Disk Capacity:** 300 M and 10 M bytes

#### LOCATION OF COMPUTER:
- **Building:** 16
- **Room:** 287

#### GENERAL PERIPHERALS:
- **Line Printer(s):** 1 ea. 900 LPM
- **Card Reader:** 1 ea. 300 CPM
- **CRT Terminals:** 3 ea. Units
- **Graphic Terminals:** 2 ea. Units
- **Color Graphic Terminals:** -- Units

#### SPECIAL H/W ARITHMETIC:
- **Mul/Div:** Firmware
- **Floating Point:** Firmware
- **Array Processor:** No

#### ADDITIONAL PERIPHERALS:
- 1 ea. model 43 Teletype

#### AVAILABLE SOFTWARE:
- **Operating Systems(s) Description:** SEL Real Time Monitor 7.0
- **Compilers/Languages:** Fortran IV
- **Application S/W:** Data Recording and Display Programs
Computer Manufacturer: SEL  
Model: SEL 32/55  
System Laboratory Use: QLS  
NASA Branch:  

**MAIN MEMORY:**
Word Size: 32 Bits  
Memory Capacity: 128K Words  
Cycle Time: 0.6 Microseconds  

**MASS MEMORY:**
Magnetic Tape: 2 ea. 9T 75IPS units at 800/1600 bpi  
2 ea. 7T 75IPS units at 556/800 bpi  
Hard Disk Capacity: 300M bytes  
Floppy Disk: -- units  

**LOCATION OF COMPUTER:**
Building 16, Room 286  
Network Interface Type: --  

**GENERAL PERIPHERALS:**
Line Printer(s): 1 ea. 900 LPM  
Card Reader: 1 ea. 1000 CPM  
Card Punch: --  
CRT Terminals: 2 ea. Units  
Graphic Terminals: -- Units  
Color Graphic Terminals: -- Units  

**SPECIAL H/W ARITHMETIC:**
Mul/Div: Firmware  
Floating Point: Firmware  
Array Processor: No  

**ADDITIONAL PERIPHERALS:**
1 ea. Paper Tape Reader, 1 ea. Model 43 Teletype  

**AVAILABLE SOFTWARE:**
Operating Systems(s) Description: SEL Real Time Operating System  
Compilers/Languages: Fortran  
Application S/W: Data Reduction, Logic card wire list programs, Data Base Management  

B-13
Computer Manufacturer: Digital Scientific	 Model: META 4

System Laboratory Use: AVL	 NASA Branch: 

MAIN MEMORY:
Word Size: 16 Bits
Memory Capacity: 48K Words
Cycle Time: 0.5 Microseconds

MASS MEMORY:
Magnetic Type: 2 ea. units at bpi

Hard Disk Capacity: 1 ea. bytes
Floppy Disk: -- units

LOCATION OF COMPUTER:
Building 16, Room 286

Network Interface Type: 

GENERAL PERIPHERALS:
Line Printer(s): 1 ea. LPM
Card Reader: 1 ea. CPM
Card Punch: 1 ea.
CRT Terminals: -- Units
Graphic Terminals: -- Units
Color Graphic Terminals: -- Units

SPECIAL H/W ARITHMETIC:
Mul/Div: 
Floating Point: 
Array Processor: 

ADDITIONAL PERIPHERALS:
Communications Controller 

AVAILABLE SOFTWARE:
Operating Systems(s) Description: Unified Test Equipment (UTE) Language

Compilers/Languages: 

Application S/W: Shuttle Test Articles Simulations
NASA/JSC COMPUTER SURVEY

Computer Manufacturer: SEL Model: SEL 32/55U
System Laboratory Use: VDS (VI) NASA Branch: EF3

MAIN MEMORY:
Word Size: 32 Bits
Memory Capacity: 64K Words
Cycle Time: 0.6 Microseconds

MASS MEMORY:
Magnetic Tape: 1 ea. 9T 75IPS units at 800/1600 bpi
Hard Disk Capacity: 10M bytes
Floppy Disk: --

LOCATION OF COMPUTER:
Building 16, Room 134

GENERAL PERIPHERALS:
Line Printer(s): 1 ea. Shared 900 LPM
Card Reader: 1 ea. 1000 CPM
Card Punch: --
CRT Terminals: 2 ea. Units
Graphic Terminals: -- Units
Color Graphic Terminals: -- Units

SPECIAL H/W ARITHMETIC:
Mul/Div: (Firmware)
Floating Point: 
Array Processor: Yes - AD10

ADDITIONAL PERIPHERALS:
8K of 4-way Shared Memory

AVAILABLE SOFTWARE:
Operating Systems(s) Description: SEL Real Time Monitor 6.0

Compilers/Languages: Fortran IV

Application S/W: Simulation of Shuttle Aerodynamics
NASANSC COMPUTER SURVEY

Computer Manufacturer: SEL
Model: SEL 32/55U
System Laboratory Use: VDS (V2)
NASA Branch: EF3

MAIN MEMORY:
Word Size: 32 Bits
Memory Capacity: 40K Words
Cycle Time: 0.6 Microseconds

MASS MEMORY:
Magnetic Tape: 1 ea. 9T 75IPS units at 800/1600 bpi
Hard Disk Capacity: 10M bytes
Floppy Disk: -- units

LOCATION OF COMPUTER:
Building 16, Room 134
Network Interface Type: --

GENERAL PERIPHERALS:
Line Printer(s): 1 ea. shared 900 LPM
Card Reader: 1 ea. 1000 CPM
Card Punch: --
CRT Terminals: 1 ea. Units
Graphic Terminals: -- Units
Color Graphic Terminals: -- Units

SPECIAL H/W ARITHMETIC:
Mul/Div: (Firmware)
Floating Point: 
Array Processor: No

ADDITIONAL PERIPHERALS:

AVAILABLE SOFTWARE:
Operating Systems(s) Description: SEL Real Time Monitor 6.0

Compilers/Languages: Fortran IV

Application S/W: Simulation of Shuttle Sensors and Navigational Aids
Computer Manufacturer: SEL  
Model: SEL 32/55U  
System Laboratory Use: VDS (V3)  
NASA Branch: EF3  

MAIN MEMORY:  
Word Size: 32 Bits  
Memory Capacity: 64K Words  
Cycle Time: 0.6 Microseconds  

Magnetic Tape: 1 ea. 9T 75IPS units at 800/1600 bpi  
Hard Disk Capacity: 10M bytes  
Floppy Disk: -- units  

LOCATION OF COMPUTER:  
Building 16, Room 134  
Network Interface Type:  

GENERAL PERIPHERALS:  
Line Printer(s): 1 ea. shared 900 LPM  
Card Reader: 1 ea. 1000 CPM  
Card Punch: --  
CRT Terminals: 2 ea. Units  
Graphic Terminals: -- Units  
Color Graphic Terminals: -- Units  

SPECIAL H/W ARITHMETIC:  
Mul/Div: Firmware  
Floating Point: No  
Array Processor: No  

ADDITIONAL PERIPHERALS:  

AVAILABLE SOFTWARE:  
Operating Systems(s) Description: SEL Real Time Monitor 6.0  
Compilers/Languages: Fortran IV  
Application S/W: Simulation of Shuttle Flight Dynamics  

B-17
**Computer Manufacturer:** SEL  
**Model:** SEL 32/55U  

### MAIN MEMORY:
- **Word Size:** 32 Bits  
- **Memory Capacity:** 48K Words  
- **Cycle Time:** 0.6 Microseconds  

### MASS MEMORY:
- **Magnetic Tape:** 9T 75IPS 1 ea. units at 800/1600 bpi  
- **Hard Disk Capacity:** 10M bytes  
- **Floppy Disk:** -- units  

### LOCATION OF COMPUTER:
- **Building:** 16  
- **Room:** 134  

### GENERAL PERIPHERALS:
- **Line Printer(s):** 1 ea. shared 900 LPM  
- **Card Reader:** 1 ea. 200 CPM  
- **Card Punch:** --  
- **CRT Terminals:** 1 Units  
- **Graphic Terminals:** -- Units  
- **Color Graphic Terminals:** -- Units  

### SPECIAL H/W ARITHMETIC:
- **Mul/Div:** Firmware  
- **Floating Point:**  
- **Array Processor:** No  

### AVAILABLE SOFTWARE:
- **Operating Systems(s) Description:** SEL Real Time Monitor 6.0  
- **Compilers/Languages:** Fortran  
- **Application S/W:** Simulation of IMU, Propulsive Forces and Moments for Shuttle
**NASA/JSC COMPUTER SURVEY**

| **Computer Manufacturer:** SEL | **Model:** SEL 32/75 |
| **System Laboratory Use:** VDS (R1) | **NASA Branch:** EF3 |

**MAIN MEMORY:**

- **Word Size:** 32 Bits
- **Memory Capacity:** 48K Words
- **Cycle Time:** 0.6 Microseconds

**MASS MEMORY:**

- **Magnetic Tape:** 1 ea. 9T 75IPS units at 800/1600 bpi
- **Hard Disk Capacity:** 10M bytes
- **Floppy Disk:** -- units

**LOCATION OF COMPUTER:**

- **Building:** 16, **Room:** 134
- **Network Interface Type:** --

**GENERAL PERIPHERALS:**

- **Line Printer(s):** 1 ea. 900 LPM
- **Card Reader:** 1 ea. 1000 CPM
- **Card Punch:** 1 ea.
- **CRT Terminals:** 1 units
- **Graphic Terminals:** -- units
- **Color Graphic Terminals:** -- units

**SPECIAL H/W ARITHMETIC:**

- **Mul/Div:** Firmware
- **Floating Point:**
- **Array Processor:** Yes - ADIO

**ADDITIONAL PERIPHERALS:**

- 8K Memory Shared with V2

**AVAILABLE SOFTWARE:**

| **Operating Systems(s) Description:** SEL Real Time Monitor 6.0 |
| **Compilers/Languages:** Fortran IV |
| **Application S/W:** Shuttle RMS Simulations |
Computer Manufacturer: SEL  Model: SEL 32/55
System Laboratory Use: VDS/SRS (D1) NASA Branch: EF3

MAIN MEMORY:
Word Size: 32 Bits
Memory Capacity: 48K Words
Cycle Time: 0.6 Microseconds

MASS MEMORY:
Magnetic Tape: 3 ea. 9T 75IPS units at 800/1600 bpi
Hard Disk Capacity: 10M bytes
Floppy Disk: -- units

LOCATION OF COMPUTER:
Building 16, Room 134

GENERAL PERIPHERALS:
Line Printer(s): 1 ea. 900 LPM
Card Reader: 1 ea. 1000 CPM
Card Punch: --
CRT Terminals: 1 ea. Units
Graphic Terminals: -- Units
Color Graphic Terminals: -- Units

SPECIAL H/W ARITHMETIC:
Mul/Div: Firmware
Floating Point: 
Array Processor: No

ADDITIONAL PERIPHERALS:

AVAILABLE SOFTWARE:
Operating Systems(s) Description: SEL Real Time Monitor 6.0
Compilers/Languages: Fortran IV
Application S/W: Real Time Data Recording
<table>
<thead>
<tr>
<th><strong>Computer Manufacturer:</strong></th>
<th>Raytheon</th>
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<th>R704</th>
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<td>VDS/SIS</td>
<td><strong>NASA Branch:</strong></td>
<td>EF3</td>
</tr>
</tbody>
</table>

### MAIN MEMORY:
- **Word Size:** 16 Bits
- **Memory Capacity:** 16K Words
- **Cycle Time:** 1.0 Microseconds

### MASS MEMORY:
- **Magnetic Tape:** 1 ea. units at bpi
- **Hard Disk Capacity:** 3M bytes
- **Floppy Disk:** -- units

### LOCATION OF COMPUTER:
- **Building:** 16, **Room:** 1055
- **Network Interface Type:** --

### GENERAL PERIPHERALS:
- **Line Printer(s):** 1 ea. 900 LPM
- **Card Reader:** 1 ea. 300 CPM
- **Card Punch:** --
- **CRT Terminals:** 1 ea. Units
- **Graphic Terminals:** -- Units
- **Color Graphic Terminals:** -- Units

### SPECIAL H/W ARITHMETIC:
- **Mul/Div:** No
- **Floating Point:** No
- **Array Processor:** No

### ADDITIONAL PERIPHERALS:
- 1 ea. ASR35 Teletype

### AVAILABLE SOFTWARE:
- **Operating Systems(s) Description:**
- **Compilers/Languages:**
- **Application S/W:**

---

B-21
Computer Manufacturer: SEL  
Model: SEL 32/55  
System Laboratory Use: ESG 1-EVD (E1)  
NASA Branch: EF3

MAIN MEMORY:
Word Size: 32 Bits
Memory Capacity: Words
Cycle Time: 0.6 Microseconds

MASS MEMORY:
Magnetic Tape: 1 ea. 9T 75IPS units at 800/1600 bpi
Hard Disk Capacity: 1UM bytes
Floppy Disk: units

LOCATION OF COMPUTER:
Building 16, Room 134

GENERAL PERIPHERALS:
Line Printer(s): 900 LPM
Card Reader: 1 ea. 1000 CPM
Card Punch: --
CRT Terminals: 1 ea. Units
Graphic Terminals: -- Units
Color Graphic Terminals: -- Units

SPECIAL H/W ARITHMETIC:
Mul/Div: Firmware
Floating Point: --
Array Processor: No

ADDITIONAL PERIPHERALS:
General Electric Visual Spacecraft Simulator

AVAILABLE SOFTWARE:
Operating Systems(s) Description: SEL Real Time Monitor 6.0
Compilers/Languages: Fortran IV
Application S/W: Scene Generation
NASA/JSC COMPUTER SURVEY

Computer Manufacturer: DEC  Model: PDP11
System Laboratory Use: Picture-EVD (2)  NASA Branch: EF3

MAIN MEMORY:
Word Size: 16 Bits
Memory Capacity: Words
Cycle Time: Microseconds

MASS MEMORY:
Magnetic Tape: 1 ea. units at bpi
Hard Disk Capacity: 2M bytes
Floppy Disk: units

LOCATION OF COMPUTER:
Building 16, Room 134

GENERAL PERIPHERALS:
Line Printer(s): LPM
Card Reader: CPM
Card Punch:
CRT Terminals: Units
Graphic Terminals: 1 ea. Units
Color Graphic Terminals: Units

SPECIAL H/W ARITHMETIC:
Mul/Div:
Floating Point:
Array Processor:

ADDITIONAL PERIPHERALS:
Decwriter, Electronic Tablet

AVAILABLE SOFTWARE:
Operating Systems(s) Description:
Compilers/Languages: Fortran
Application S/W: Graphics

B-23
NASA/JSC COMPUTER SURVEY

Computer Manufacturer: DEC  Model: PDP11/35
System Laboratory Use: ESG2-EVD (3)  NASA Branch: EF3

MAIN MEMORY:
Word Size: 16 Bits
Memory Capacity: 32K Words
Cycle Time: Microseconds

MASS MEMORY:
Magnetic Tape: 1 ea. units at bpi
Hard Disk Capacity: 2M bytes
Floppy Disk: units

LOCATION OF COMPUTER:
Building 16, Room 134

GENERAL PERIPHERALS:
Line Printer(s): LPM
Card Reader: CPM
Card Punch:
CRT Terminals:
Graphic Terminals:
Color Graphic Terminals:

SPECIAL H/W ARITHMETIC:
Mul/Div:
Floating Point:
Array Processor:

ADDITIONAL PERIPHERALS:
Decwriter, Evans and Sutherland Scene Generator

AVAILABLE SOFTWARE:
Operating Systems(s) Description:
Compilers/Languages: Fortran
Application S/W: Scene Generation
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<td></td>
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<tr>
<td>Memory Capacity: 32K Words</td>
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<td>CRT Terminals: Units</td>
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<td>Graphic Terminals: Units</td>
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<td>Compilers/Languages: Fortran</td>
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<td>Application S/W: Scene Generation</td>
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</table>
Computer Manufacturer: DEC  Model: PDP11/45
System Laboratory Use: ESG2-EVD (5)  NASA Branch: EF3

MAIN MEMORY:
Word Size: 16 Bits
Memory Capacity: 48K Words
Cycle Time: Microseconds

MASS MEMORY:
Magnetic Tape: 1 ea. units at bpi
Hard Disk Capacity: 1 ea. 2M bytes
Floppy Disk: units

LOCATION OF COMPUTER:
Building 16, Room 134
Network Interface Type:

GENERAL PERIPHERALS:
Line Printer(s): -- LPM
Card Reader: 300 CPM
Card Punch: --
CRT Terminals: -- Units
Graphic Terminals: -- Units
Color Graphic Terminals: -- Units

SPECIAL H/W ARITHMETIC:
Mul/Div: 
Floating Point: 
Array Processor: 

ADDITIONAL PERIPHERALS:
Decwriter

AVAILABLE SOFTWARE:
Operating System(s) Description:
Compilers/Languages: Fortran
Application S/W: Scene Generation Collision Avoidance Detection
### NASA/JSC COMPUTER SURVEY

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<th>Computer Manufacturer:</th>
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<tr>
<td>System Laboratory Use:</td>
<td>SDL (M1)</td>
<td>NASA Branch: EF3</td>
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</table>

### MAIN MEMORY:
- **Word Size:** 32 Bits
- **Cycle Time:** 0.6 Microseconds

### MASS MEMORY:
- **Magnetic Tape:** 2 ea. 9T 75IPS units at 800/1600 bpi
- **Hard Disk Capacity:** 10M, 80M, 300M bytes
- **Floppy Disk:** units

### LOCATION OF COMPUTER:
- **Building:** 16
- **Room:** 295

### GENERAL PERIPHERALS:
- **Line Printer(s):** 1 ea. 900 LPM
- **Card Reader:** 1 ea. 1000 CPM
- **Card Punch:** 1 ea.
- **CRT Terminals:** 5 ea. Units
- **Graphic Terminals:** -- Units
- **Color Graphic Terminals:** -- Units

### SPECIAL H/W ARITHMETIC:
- **Mul/Div:** (Firmware)
- **Floating Point:**
- **Array Processor:** No

### ADDITIONAL PERIPHERALS:

### AVAILABLE SOFTWARE:
- **Operating Systems(s) Description:** SEL Real Time Monitor
- **Compilers/Languages:** Fortran
- **Application S/W:**

---

B-27
<table>
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<td>CRT Terminals</td>
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<td>Graphic Terminals</td>
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<td>Color Graphic Terminals</td>
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<td>Mul/Div</td>
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<td>Operating Systems(s)</td>
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<td>Application S/W</td>
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Computer Manufacturer: MODCOMP
Model: Classic

System Laboratory Use: SAIL/GTS
NASA Branch:

MAIN MEMORY:
Word Size: 16 Bits
Memory Capacity: Words
Cycle Time: Microseconds

MASS MEMORY:
Magnetic Tape: 2 ea. units at bpi
Hard Disk Capacity: 1 ea. bytes
Floppy Disk: units

LOCATION OF COMPUTER:
Building 16, Room 194

Network Interface Type:

GENERAL PERIPHERALS:
Line Printer(s): 1 ea. LPM
Card Reader: 1 ea. 300 CPM
Card Punch: Units
CRT Terminals: 1 ea. Units
Graphic Terminals: Units
Color Graphic Terminals: Units

SPECIAL H/W ARITHMETIC:
Mul/Div: 
Floating Point: 
Array Processor: 

ADDITIONAL PERIPHERALS:
Silent 700 Terminal/Printer

AVAILABLE SOFTWARE:
Operating Systems(s) Description:

Compilers/Languages:

Application S/W: Non-Avionics Simulations
Computer Manufacturer: SEL  
Model: SEL 32/55U

System Laboratory Use: FDS  
NASA Branch: EF3

MAIN MEMORY:
Word Size: 32 Bits
Memory Capacity: 64K Words
Cycle Time: 0.6 Microseconds

MASS MEMORY:
Magnetic Tape: 1 ea. 9T 75IPS units at 800/1600 bpi
Hard Disk Capacity: 10M bytes
Floppy Disk: -- units

LOCATION OF COMPUTER:
Building 16, Room 294

GENERAL PERIPHERALS:
Line Printer(s): 1 ea. shared 900 LPM
Card Reader: 1 ea. CPM
Card Punch: --
CRT Terminals: 1 ea. Units
Graphic Terminals: -- Units
Color Graphic Terminals: -- Units

SPECIAL H/W ARITHMETIC:
Mul/Div: (Firmware)
Floating Point: 
Array Processor: Yes - AD10

ADDITIONAL PERIPHERALS:
8K Shared Memory with R2
8K Shared Memory with F2, F3, and F4

AVAILABLE SOFTWARE:
Operating Systems(s) Description: SEL Real Time Monitor 6.0
Compilers/Languages: Fortran IV
Application S/W: Shuttle Aerodynamics Simulation
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<tr>
<th><strong>Computer Manufacturer:</strong></th>
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<tr>
<td><strong>System Laboratory Use:</strong></td>
<td>FDS (F2)</td>
<td><strong>NASA Branch:</strong></td>
<td>EF3</td>
</tr>
</tbody>
</table>

**MAIN MEMORY:**
- **Word Size:** 32 Bits
- **Memory Capacity:** 48K Words
- **Cycle Time:** 0.6 Microseconds

**MASS MEMORY:**
- **Magnetic Tape:** 1 ea. 9T 75IPS units at 800/1600 bpi
- **Hard Disk Capacity:** 10M bytes
- **Floppy Disk:** -- units

**LOCATION OF COMPUTER:**
- **Building:** 16
- **Room:** 294

**GENERAL PERIPHERALS:**
- **Line Printer(s):** 1 ea. shared 900 LPM
- **Card Reader:** 1 ea.
- **Card Punch:** --
- **CRT Terminals:** 1 ea.
- **Graphic Terminals:** --
- **Color Graphic Terminals:** --

**SPECIAL H/W ARITHMETIC:**
- **Mul/Div:** (Firmware)
- **Floating Point:**
- **Array Processor:** (No)

**ADDITIONAL PERIPHERALS:**
- 8K Shared Memory with F1, F3, and F4

**AVAILABLE SOFTWARE:**
- **Operating Systems(s) Description:** SEL Real Time Monitor 6.0
- **Compilers/Languages:** Fortran IV
- **Application S/W:** Simulation of Shuttle Sensors and Navigation Aids
Computer Manufacturer: SEL  
Model: SEL 32/55U  

System Laboratory Use: FOS (F3)  
NASA Branch: FF3  

**MAIN MEMORY:**  
Word Size: 32 Bits  
Memory Capacity: 64K Words  
Cycle Time: 0.6 Microseconds  

**MASS MEMORY:**  
Magnetic Tape: 1 ea. 9T 75IPS units at 800/1600 bpi  
Hard Disk Capacity: 10M bytes  
Floppy Disk: -- units  

**LOCATION OF COMPUTER:**  
Building 16, Room 294  
Network Interface Type: --  

**GENERAL PERIPHERALS:**  
Line Printer(s): 1 ea. Shared 900 LPM  
Card Reader: 1 ea. CPM  
Card Punch: --  
CRT Terminals: 1 ea. Units  
Graphic Terminals: -- Units  
Color Graphic Terminals: -- Units  

**SPECIAL H/W ARITHMETIC:**  
Mul/Div: (Firmware)  
Floating Point: No  
Array Processor: No  

**ADDITIONAL PERIPHERALS:**  
8K Shared Memory with F1, F2, and F4  

**AVAILABLE SOFTWARE:**  
Operating Systems(s) Description: SEL Real Time Monitor 6.0  
Compilers/Languages: Fortran IV  
Application S/W: Simulation of Shuttle Flight Dynamics
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<td>System Laboratory Use:</td>
<td>FDS (F4) NASA Branch: EF3</td>
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</table>

**MAIN MEMORY:**
- Word Size: 32 Bits
- Memory Capacity: 48K Words
- Cycle Time: 0.6 Microseconds

**MASS MEMORY:**
- Magnetic Tape: 1 ea, 9T 75IPS units at 800/1600 bpi units at bpi
- Hard Disk Capacity: 10M bytes
- Floppy Disk: -- units

**LOCATION OF COMPUTER:**
- Building 16, Room 294
- Network Interface Type: --

**GENERAL PERIPHERALS:**
- Line Printer(s): 1 ea, Shared 900 LPM
- Card Reader: 1 ea, CPM
- Card Punch: --
- CRT Terminals: 1 ea Units
- Graphic Terminals: -- Units
- Color Graphic Terminals: -- Units

**SPECIAL H/W ARITHMETIC:**
- Mul/Div: Firmware
- Floating Point: 
- Array Processor: No

**ADDITIONAL PERIPHERALS:**
- 8K Shared Memory with F1, F2, and F3

**AVAILABLE SOFTWARE:**
- Operating Systems(s) Description: SEL Real Time Monitor 6.0
- Compilers/Languages: Fortran IV
- Application S/W: Simulation of IMU, Propulsive Forces and Moments for Shuttle
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</table>

**main memory:**
- **word size:** 32 bits
- **memory capacity:** 48K words
- **cycle time:** 0.6 microseconds

**mass memory:**
- **magnetic tape:** 1 AT 75IPS units at 800/1600 bpi
- **hard disk capacity:** 10M bytes
- **floppy disk:** units

**location of computer:**
- **building:** 16, **room:** 294

**general peripherals:**
- **line printer(s):** LPM
- **card reader:** CPM
- **card punch:**
- **CRT terminals:** 1 units
- **graphic terminals:** units
- **color graphic terminals:** units

**special H/W arithmetic:**
- **mul/div:** firmware
- **floating point:**
- **array processor:** no

**additional peripherals:**

**available software:**
- **operating systems(s) description:** SEL Real Time Monitor 6.0
- **compilers/languages:** Fortran IV
- **application s/w:** Simulation of Shuttle RMS System
NASA/JSC COMPUTER SURVEY

Computer Manufacturer: SEL	 Model: SEL 32/55
System Laboratory Use: FDS/GRD (D2) NASA Branch: EF3

MAIN MEMORY:
Word Size: 32 Bits
Memory Capacity: 56K Words
Cycle Time: 0.6 Microseconds

MASS MEMORY:
Magnetic Tape: 3 ea. 9T 75IPS units at 800/1600 bpi
Hard Disk Capacity: 10M bytes
Floppy Disk: -- units

LOCATION OF COMPUTER:
Building 16, Room 295

GENERAL PERIPHERALS:
Line Printer(s): 1 ea. 900 LPM
Card Reader: 1 ea. 1000 CPM
Card Punch: --
CRT Terminals: 1 ea. Units
Graphic Terminals: -- Units
Color Graphic Terminals: -- Units

SPECIAL H/W ARITHMETIC:
Mul/Div: (Firmware)
Floating Point: (Firmware)
Array Processor: No

ADDITIONAL PERIPHERALS:

AVAILABLE SOFTWARE:
Operating Systems(s) Description: SEL Real Time Monitor 6.0
Compilers/Languages: Fortran IV
Application S/W: Real Time Data Recording
### NASA/JSC COMPUTER SURVEY

**Computer Manufacturer:** Raytheon  
**Model:** R704  
**System Laboratory Use:** FDS/GSI (3)  
**NASA Branch:** EF3  

#### MAIN MEMORY:
- **Word Size:** 16 Bits  
- **Memory Capacity:** 16K Words  
- **Cycle Time:** 1.0 Microseconds

#### MASS MEMORY:
- **Magnetic Tape:** 1 ea. units at bpi  
- **Hard Disk Capacity:** 1 ea. 3M bytes  
- **Floppy Disk:** -- units

#### LOCATION OF COMPUTER:
- **Building:** 16  
- **Room:** 1055

#### GENERAL PERIPHERALS:
- **Line Printer(s):** 1 ea. LPM  
- **Card Reader:** 1 ea. 300 CPM  
- **CRT Terminals:** 1 ea. Units  
- **Graphic Terminals:** -- Units  
- **Color Graphic Terminals:** -- Units

#### SPECIAL H/W ARITHMETIC:
- **Mul/Div:** No  
- **Floating Point:** No  
- **Array Processor:** No

#### ADDITIONAL PERIPHERALS:

#### AVAILABLE SOFTWARE:
**Operating Systems(s) Description:**

**Compilers/Languages:**

**Application S/W:**
Computer Manufacturer: SEL  
Model: SEL 32/55U  
System Laboratory Use: SES (S1)  
NASA Branch: EF3 

MAIN MEMORY: 
Word Size: 32 Bits  
Memory Capacity: 48K Words  
Cycle Time: 0.6 Microseconds  

MASS MEMORY: 
Magnetic Tape: 1 ea. 9T 75IPS units at 800/1600 bpi  
Hard Disk Capacity: 1 ea. Shared 10M bytes  
Floppy Disk: -- units  

LOCATION OF COMPUTER: 
Building 16, Room 135  
Network Interface Type: --  

GENERAL PERIPHERALS: 
Line Printer(s): 1 ea. Shared 900 LPM  
Card Reader: 1 ea. 1000 CPM  
Card Punch: --  
CRT Terminals: 1 ea. Units  
Graphic Terminals: -- Units  
Color Graphic Terminals: -- Units  

SPECIAL H/W ARITHMETIC: 
Mul/Div: Firmware  
Floating Point:  
Array Processor: No  

ADDITIONAL PERIPHERALS:  

AVAILABLE SOFTWARE: 
Operating Systems(s) Description: SEL Real Time Monitor 6.0  
Compilers/Languages: Fortran IV  
Application S/W:  

B-37
Computer Manufacturer: SEL  
Model: SEL 32/55U  
System Laboratory Use: SES (S2) NASA Branch: EF3

MAIN MEMORY:
Word Size: 32 Bits  
Memory Capacity: 48K Words  
Cycle Time: 0.6 Microseconds

MASS MEMORY:
Magnetic Tape: 1 ea. 9T 75IPS units at 800/1600 bpi  
Hard Disk Capacity: 1 ea. Shared 10M bytes  
Floppy Disk: -- units

LOCATION OF COMPUTER:
Building 16, Room 135

GENERAL PERIPHERALS:
Line Printer(s): 1 ea. Shared 900 LPM  
Card Reader: 1 ea. 1000 CPM  
Card Punch: --  
CRT Terminals: 1 Units  
Graphic Terminals: -- Units  
Color Graphic Terminals: -- Units

SPECIAL H/W ARITHMETIC:
Mul/Div: Firmware  
Floating Point:  
Array Processor: No

ADDITIONAL PERIPHERALS:

AVAILABLE SOFTWARE:
Operating Systems(s) Description: SEL Real Time Monitor 6.0

Compilers/Languages: Fortran IV

Application S/W:
Computer Manufacturer: SEL
Model: SEL 32/55U
System Laboratory Use: SES (S3) NASA Branch: EF3

MAIN MEMORY:
Word Size: 32 Bits
Memory Capacity: 48K Words
Cycle Time: 0.6 Microseconds

MASS MEMORY:
Magnetic Tape: 1 ea. 9T 75 IPS units at 800/1600 bpi
Hard Disk Capacity: 10M bytes
Floppy Disk: -- units

LOCATION OF COMPUTER:
Building 16, Room 135

GENERAL PERIPHERALS:
Line Printer(s): 1 ea. 900 LPM
Card Reader: 1 ea. 300 CPM
Card Punch: --
CRT Terminals: 2 ea. Units
Graphic Terminals: -- Units
Color Graphic Terminals: -- Units

SPECIAL H/W ARITHMETIC:
Mul/Div: Firmware
Floating Point: --
Array Processor: Yes, AD10

ADDITIONAL PERIPHERALS:

AVAILABLE SOFTWARE:
Operating Systems(s) Description: SEL Real Time Monitor 6.0
Compilers/Languages: Fortran IV
Application S/W:
Computer Manufacturer: SEL  
Model: SEL 32/75  
System Laboratory Use: SES (R3)  
NASA Branch: EF3

MAIN MEMORY:
Word Size: 32 Bits  
Memory Capacity: 64K Words  
Cycle Time: 0.6 Microseconds

MASS MEMORY:
Magnetic Tape: 1 ea. 9T 75IPS units at 800/1600 bpi  
Hard Disk Capacity: 10M bytes  
Floppy Disk: -- units

LOCATION OF COMPUTER:
Building 16, Room 135

GENERAL PERIPHERALS:
Line Printer(s): 1 ea. 900 LPM  
Card Reader: 1 ea. 1000 CPM  
Card Punch: --  
CRT Terminals: 1 ea. Units  
Graphic Terminals: -- Units  
Color Graphic Terminals: -- Units

SPECIAL H/W ARITHMETIC:
Mul/Div: Firmware  
Floating Point:  
Array Processor: No

ADDITIONAL PERIPHERALS:

AVAILABLE SOFTWARE:
Operating Systems(s) Description: SEL Real Time Monitor 6.0  
Compilers/Languages: Fortran IV  
Application S/W: Remote Manipulator System Simulation
Computer Manufacturer: SEL  Model: SEL 32/75
System Laboratory Use: SES (L1) NASA Branch: EF3

MAIN MEMORY:
Word Size: 32 Bits
Memory Capacity: Words
Cycle Time: 0.6 Microseconds

MASS MEMORY:
Magnetic Tape: 1 ea. 9T 75IPS units at 800/1600 bpi
Hard Disk Capacity: 10M bytes
Floppy Disk: Units

LOCATION OF COMPUTER:
Building 16, Room 135

GENERAL PERIPHERALS:
Line Printer(s): 1 ea. 900 LPM
Card Reader: 1 ea. 1000 CPM
Card Punch:
CRT Terminals: 1 ea. Units
Graphic Terminals: Units
Color Graphic Terminals: Units

SPECIAL H/W ARITHMETIC:
Mul/Div: Firmware
Floating Point: 
Array Processor: No

ADDITIONAL PERIPHERALS:

AVAILABLE SOFTWARE:
Operating Systems(s) Description: SEL Real Time Monitor
Compilers/Languages: Fortran IV
Application S/W: Simulation of Shuttle Payloads and Payload Interfaces
Computer Manufacturer: SEL
Model: SEL 32/75
System Laboratory Use: SES (G1) NASA Branch: EF3

MAIN MEMORY:
Word Size: 32 Bits
Memory Capacity: Words
Cycle Time: 0.6 Microseconds

MASS MEMORY:
Magnetic Tape: 9T 75IPS units at 800/1600 bpi
Hard Disk Capacity: 10M bytes
Floppy Disk: units

LOCATION OF COMPUTER:
Building 16, Room 135
Network Interface Type: --

GENERAL PERIPHERALS:
Line Printer(s): 1 ea. 900 LPM
Card Reader: 1 ea. 1000 CPM
Card Punch: --
CRT Terminals: 1 ea. Units
Graphic Terminals: 1 ea. Units
Color Graphic Terminals: -- Units

SPECIAL H/W ARITHMETIC:
Mul/Div: Firmware
Floating Point: 
Array Processor: No

ADDITIONAL PERIPHERALS:

AVAILABLE SOFTWARE:
Operating Systems(s) Description: SEL Real Time Monitor 6.0
Compilers/Languages: Fortran IV
Application S/W: Graphics
NASA/JSC COMPUTER SURVEY

Computer Manufacturer: SEL Model: SEL 32/55
System Laboratory Use: SES (D3) NASA Branch: EF3

MAIN MEMORY:
Word Size: 32 Bits
Memory Capacity: 64K Words
Cycle Time: 0.6 Microseconds

MASS MEMORY:
Magnetic Tape: 1 ea. 9T 75IPS units at 800/1600 bpi
Hard Disk Capacity: 10M bytes
Floppy Disk: -- units

LOCATION OF COMPUTER:
Building 16, Room 135

GENERAL PERIPHERALS:
Line Printer(s): 1 ea. Shared 900 LPM
Card Reader: 1 ea. 1000 CPM
Card Punch: --
CRT Terminals: 2 ea. Units
Graphic Terminals: -- Units
Color Graphic Terminals: -- Units

SPECIAL H/W ARITHMETIC:
Mul/Div: Firmware
Floating Point: 
Array Processor: No

ADDITIONAL PERIPHERALS:

AVAILABLE SOFTWARE:
Operating Systems(s) Description: SEL Real Time Monitor
Compilers/Languages: Fortran IV
Application S/W: Data Recording
Computer Manufacturer: SEL
Model: SEL 32/55

System Laboratory Use: SES (DD) NASA Branch: EF3

MAIN MEMORY:
Word Size: 32 Bits
Memory Capacity: Words
Cycle Time: 0.6 Microseconds

MASS MEMORY:
Magnetic Tape: 2 ea. 9T 75IPS units at 800/1600 bpi
Hard Disk Capacity: 300M & 10M bytes
Floppy Disk: -- units

LOCATION OF COMPUTER:
Building 16, Room 135
Network Interface Type: --

GENERAL PERIPHERALS:
Line Printer(s): 1 ea. 900 LPM
Card Reader: 1 ea. 1000 CPM
Card Punch: --
CRT Terminals: 2 ea. Units
Graphic Terminals: -- Units
Color Graphic Terminals: -- Units

SPECIAL H/W ARITHMETIC:
Mul/Div: Firmware
Floating Point: 
Array Processor: No

ADDITIONAL PERIPHERALS:

AVAILABLE SOFTWARE:
Operating Systems(s) Description: SEL Real Time Monitor 6.0
Compilers/Languages: Fortran IV
Application S/W: Data Reduction
Computer Manufacturer: XEROX  Model: SIGMA 5
System Laboratory Use: SES  NASA Branch: EF3

MAIN MEMORY:
Word Size: 32 Bits
Memory Capacity: 65K Words
Cycle Time: Microseconds

MASS MEMORY:
Magnetic Tape: 2 9-Track units at bpi
1 7-Track units at bpi
Hard Disk Capacity: 2 ea. 3M bytes
Floppy Disk: units

LOCATION OF COMPUTER:
Building 16, Room 135
Network Interface Type: --

GENERAL PERIPHERALS:
Line Printer(s): 1 ea. LPM
Card Reader: 1 ea. CPM
Card Punch: 1 ea.
CRT Terminals: Units
Graphic Terminals: Units
Color Graphic Terminals: Units

SPECIAL H/W ARITHMETIC:
Mul/Div: 
Floating Point: 
Array Processor: 

ADDITIONAL PERIPHERALS:

AVAILABLE SOFTWARE:
Operating Systems(s) Description: 
Compilers/Languages: Fortran
Application S/W: 

B-45
Computer Manufacturer: **DEC**
Model: **PDP 11/40**

System Laboratory Use: **SES** (-1) NASA Branch: **EF3**

**MAIN MEMORY:**
- Word Size: 16 Bits
- Memory Capacity: 32K Words
- Cycle time: Microseconds

**MASS MEMORY:**
- Magnetic Tape: 1 ea. units at bpi
- Hard Disk Capacity: 3M bytes
- Floppy Disk: -- units

**LOCATION OF COMPUTER:**
- Building 16, Room 135

**GENERAL PERIPHERALS:**
- Line Printer(s): -- LPM
- Card Reader: -- CPM
- Card Punch: --
- CRT Terminals: -- Units
- Graphic Terminals: 1 Units
- Color Graphic Terminals: -- Units

**SPECIAL H/W ARITHMETIC:**
- Mul/Div:
- Floating Point:
- Array Processor:

**ADDITIONAL PERIPHERALS:**
- Decwriter

**AVAILABLE SOFTWARE:**
- Operating Systems(s) Description:
- Compilers/Languages: Fortran
- Application S/W: Graphics
Computer Manufacturer: DEC  
Model: PDP11/34

System Laboratory Use: SES  (-6) NASA Branch: EF3

MAIN MEMORY:
Word Size: 16 Bits
Memory Capacity: 80K Words
Cycle Time: Microseconds

MASS MEMORY:
Magnetic Tape: 1 ea. units at __________ bpi
Hard Disk Capacity: 2 ea. at 8M bytes each
Floppy Disk: -- units

LOCATION OF COMPUTER:
Building 16, Room 135

GENERAL PERIPHERALS:
Line Printer(s): 1 ea. 900 LPM
Card Reader: 1 ea. 300 CPM
Card Punch: --
CRT Terminals: 3 Units
Graphic Terminals: -- Units
Color Graphic Terminals: -- Units

SPECIAL H/W ARITHMETIC:
Mul/Div: --
Floating Point: --
Array Processor: Yes 2 each AD10

ADDITIONAL PERIPHERALS:
Decwriter, DEC Terminal

AVAILABLE SOFTWARE:
Operating Systems(s) Description:
Compilers/Languages: Fortran
Application S/W: Host Computer for AD10 Processors
<table>
<thead>
<tr>
<th><strong>Computer Manufacturer:</strong></th>
<th>CDC</th>
<th><strong>Model:</strong></th>
<th>Cyber 74</th>
<th><strong>System Laboratory Use:</strong></th>
<th>EF3/SES</th>
<th><strong>NASA Branch:</strong></th>
<th>EH2/EF3</th>
</tr>
</thead>
</table>

**MAIN MEMORY:**
- **Word Size:** 60 Bits
- **Memory Capacity:** 131K Words
- **Cycle Time:** 0.1/1.0 Microseconds

**MASS MEMORY:**
- **Magnetic Tape:** 2 ea. 7T 150IPS units at 556/800 bpi
- **Magnetic Tape:** 2 ea. 7T 150IPS units at 200/556/800 bpi
- **Hard Disk Capacity:** 4 ea. 300M bytes
- **Floppy Disk:** --

**LOCATION OF COMPUTER:**
- **Building:** 16
- **Room:** 134

**NETWORK INTERFACE TYPE:** --

**GENERAL PERIPHERALS:**
- **Line Printer(s):** 1 ea. 1200 LPM
- **Card Reader:** 1 ea. 500 CPM
- **Card Punch:** --
- **CRT Terminals:** 3 ea. Units
- **Graphic Terminals:** -- Units
- **Color Graphic Terminals:** -- Units

**SPECIAL H/W ARITHMETIC:**
- **Mul/Div:** Yes
- **Floating Point:** Yes
- **Array Processor:** No

**ADDITIONAL PERIPHERALS:**

**AVAILABLE SOFTWARE:**
- **Operating Systems(s) Description:**

- **Compilers/Languages:** Fortran, Cobol, Compass (Assembly)

- **Application S/W:** Space Shuttle Flight Simulations (SSFS)