

302-CD-002-001

EOSDIS Core System Project

SDPS/CSMS Release A and FOS Releases A and B Facilities Plan for the ECS Project

September 1995

Hughes Information Technology Corporation
Upper Marlboro, Maryland

SDPS/CSMS Release A and FOS Releases A and B Facilities Plan for the ECS Project

September 1995

Prepared Under Contract NAS5-60000
CDRL Item 043

APPROVED BY

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Preface

This document is a contract deliverable with an approval code 2. As such, it does not require formal Government approval, however, the Government reserves the right to request changes within 45 days of the initial submittal. Once approved, contractor changes to this document are handled in accordance with Class I and Class II change control requirements described in the EOS Configuration Management Plan, and changes to this document shall be made by document change notice (DCN) or by complete revision.

A preliminary Facilities Plan for the ECS Project was published in June 1994 and was approved by the government in September 1994. Data contained in that document was updated and published in March 1995 via a Facilities Plan White Paper (800-WP-001-001). Information contained in these documents as well as comments received for both are incorporated in this submittal; however, this document is specific to SDPS/CSMS Release A and FOS Releases A and B, and supersedes the Release A information contained in earlier submittals.

Any questions should be addressed to:

Data Management Office
The ECS Project Office
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Abstract

This document is intended as the final Facilities Plan for SDPS/CSMS Release A and FOS Releases A and B. The preliminary Facilities Plan for the ECS Project was published in June 1994 and updated in May 1995 via a Facilities Plan for Ir-1 and Release A White Paper. Comments received for both of these documents are incorporated in this submittal; however, this document is specific to SDPS/CSMS Release A and FOS Releases A and B and supersedes previous submittals. This plan provides requirements and physical plans for ECS facilities and operations areas. It includes the following information:

- Space requirements with partitioning;
- Electrical power and air conditioning requirements and electrical loads.

The data and plans contained within this document are based on the best available information known at this time. This document contains the number and type of requirement that will be furnished. This representation is shown in the form of floor layouts for the four sites receiving equipment for Release-A. These sites are Goddard Space Flight Center (GSFC), Langley Research Center (LaRC), Marshall Space Flight Center (MSFC), and EROS Data Center (EDC).

Keywords: floor diagrams, equipment, space, cooling, heating, grounding, environmental, security, fire protection, Facilities.

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1. Introduction

1.1 Identification

This document, Contract Data Requirements List (CDRL) item 043, whose requirements are specified in Data Item Description (DID) 302/DV1, is a required deliverable under the Earth Observing System Data and Information System (EOSDIS) Core System (ECS), Contract (NAS5-6000).

1.2 Scope

A preliminary Facilities Plan for the ECS Project was published in June 1994 and was approved by the government in September 1994. Data contained in that document was updated and published in March 1995 via a Facilities Plan White Paper (800-WP-001-001). Information contained in these documents as well as comments received for both are incorporated in this submittal; however, this document is specific to SDPS/CSMS Release A and FOS Releases A and B, and supersedes the Release A information contained in earlier submittals.

1.3 Purpose

This plan provides requirements and physical plans for the four ECS DAAC facilities and operations areas that are receiving hardware and software for SDPS and CSMS Release A and FOS Releases A and B. It includes the following information:

- Space requirements with partitioning;
- Electrical power and air conditioning requirements and electrical loads.

The data and plans contained within this document are based on the best available information known at this time. This document contains the number and type of equipment that will be furnished. This representation is shown in the form of floor layouts for the four sites receiving equipment during this timeframe. These sites are Goddard Space Flight Center (GSFC), Langley Research Center (LaRC), Marshall Space Flight Center (MSFC), and EROS Data Center (EDC).

1.4 Status and Schedule

This CDRL submittal is specific to SDPS/CSMS Release A and FOS Releases A and B; however, it does contain information available in previous submittals (see 1.2 above). While future releases of the Facilities Plan will be release-specific as well, (e.g, SDPS/CSMS Release B), each new submittal will incorporate information concerning the prior releases to present a total environment.

1.5 Organization

This document is organized as follows:

Section 1 Introduction provides the Identification, Scope, Purpose, Status and Schedule, and Organization, for this document.

Section 2 Related Documentation provides the list of Parent, Reference, and Applicable Documents.

Section 3 ECS Facilities Requirements describes the facility requirements that are to be provided by the DAACs.

Section 4 Facility Diagrams describes the equipment layouts and the rooms making up the facility diagrams.

Appendix A provides facility diagrams (equipment layouts) and other requirements such as space, power, cooling, network configurations and office space at each of the DAACs. These diagrams show the footprint of the equipment on their computer room floors.

Questions regarding information contained within this document should be addressed to the following ECS contacts:

- ECS Contacts
 - Roger D. Nelson, Facilities/Hardware Planner, (301) 925-0708, rnelson@eos.hitc.com
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Questions concerning distribution or control of this document should be addressed to:

Data Management Office
The ECS Project Office
Hughes Applied Information Systems
1616 McCormick Dr.
Landover, MD 20785

2. Related Documentation

2.1 Parent Documents

The following documents are the parents from which the scope and content of this document derive:

423-41-01	Goddard Space Flight Center, EOSDIS Core System (ECS) Statement of Work
423-41-02	Goddard Space Flight Center, Functional and Performance Requirements Specification for the EOSDIS Core System (ECS)
420-05-03	Goddard Space Flight Center, Earth Observing System (EOS) Performance Assurance Requirements for the EOSDIS Core System (ECS)

2.2 Applicable Documents

The following documents are referenced within this SDPS/CSMS Release A and FOS Releases A and B Facilities Plan, or are directly applicable, or contain policies or other directive matters that are binding upon the content of this volume:

500-TIP-2110	Goddard Space Flight Center, Mission Operations and Data Systems Directorate (MO&DSD) Technical Information Program Specifications for Document Formats
DOD-STD-1686	Military Standard: Electrostatic Discharge Control Program for Protection of Electrical and Electronic Parts, Assemblies, and Equipment
MIL STD 1388-1A	Military Standard: Logistics Support Analysis

2.3 Information Documents

The following documents amplify or clarify the information presented in this document. These documents are not binding on the content of this SDPS/CSMS Release A and FOS Releases A and B Facilities Plan.

194-207-SE1-001	System Design Specification for the ECS Project
101-303-DV1-001	Individual Facility Requirements for the ECS Project
194-501-PA1-001	Performance Assurance Implementation Plan (PAIP) for the ECS Project
604-CD-001-004	Operations Concept for the ECS Project: Part 1-- ECS Overview

604-CD-002-001 Operations Concept for the ECS project: Part 2B -- ECS Release B, Annotated Outline

604-CD-003-001 ECS Operations Concept for the ECS Project: Part 2A -- ECS Release A

617-CD-001-002 Logistics Support Analysis Plan for the ECS Project

622-CD-001-001 Training Plan for the ECS Project.

3. ECS Facility Requirements

3.1 Facility Access Dates

Access to ECS facilities is required by the dates listed in the Key Site Activation Dates table provided in Appendix A. The ECS Contractor Team assumes that the Government will have completed installation of the power distribution, cooling and air-conditioning units, and cable tray systems prior to the installation of ECS equipment.

A major delay in the schedules could occur if the facility access date slipped more than five weeks. This slippage would impact down-stream activities such as resource schedules and costs and ECS operation dates. A minor slip would be any slip in the facility access date that still allows the site installation to be completed on schedule. Our approach for verifying that requirements have been met includes conducting a facility inspection prior to the scheduled installation. Unresolved discrepancies between DAAC plans and ECS requirements will be forwarded to the ESDIS Project Office.

Government-furnished external communication links must be available for testing prior to start of ECS release integration and testing. Required facility access dates are determined through backward planning, which starts with the Integration and Test date for IR-1. Time is allocated for acceptance testing; segment and system integration and testing; installation of the hardware, software, and local area network (LAN); and for pre-installation survey and staging of the equipment. The times required for each site vary depending upon the quantity and complexity of the hardware and software planned.

Government-furnished plans, procedures, and handbooks relevant to the operation and support of each DAAC facility are also required. These administrative documents include the policies, procedures, standards, and regulations the contractor must comply with while a tenant of the host facility. Other administrative information such as organization charts, telephone books, bulletins, and administrative notices are also needed to operate effectively at the local site. These documents will be obtained from local sites during site pre-installation surveys.

3.2 Power

The electrical power loads for the ECS equipment at Release IR-1 and Release A at each of the ECS DAAC sites are provided in Appendix A. The power requirements will be 208/120 volts conditioned power. Specific details of the power requirements for each piece of equipment will be furnished in the site Installation Plans for Release A.

3.2.1 Uninterruptible Power Supply (UPS) Systems

Government-furnished UPS systems are required at DAAC sites to support operation of critical equipment for 20 minutes. This will allow for a graceful shutdown and the backup of critical

data. Load requirements for each site's UPS systems are shown in Appendix A. UPS systems are recommended to accomplish the following:

- Condition power to negate surges, spikes, and other power fluctuations that may adversely affect computer hardware operation and data quality.
- Provide power during outages of short duration to allow time for controlled shutdown and switch over to auxiliary backup power, if available.
- Enable DAACs to remain operational during periods of unusual electrical activity, such as thunderstorms, or in areas where utility company power is unstable.

3.2.2 Auxiliary Power

All sites that are in regions with a history of loss of power for more than 15-minutes per occurrence should consider furnishing an auxiliary source of power. This power would be needed for the air conditioning units which support the environment-controlled data archive areas. Fluctuation in temperature and humidity are the major causes of media breakdown. Because the ECS media will be used for many years, precautions should be taken to ensure reliability of the data and to prolong the useful life of the media. Manufacturers recommend the following environmental conditions for optimum reliability and operating life of their tape media.

	Storage	Operating
Temperature	68° ± 9° F	41° to 113° F
Relative Humidity	50% ± 20 %	20% to 80 %

If tape media are exposed to operating temperature changes greater than 30 degrees Fahrenheit, conditioning of the tapes will be required. This conditioning requires rewinding the tape end-to-end, which would be time-consuming and costly for a large library. As the temperature and humidity rise due to the loss of the air conditioning, degradation of the media starts, shortening its useful life. The required humidity and temperature conditions should be maintained with an auxiliary power system to support the air conditioning systems during power loss. Each site should evaluate their risk of power loss to determine if an auxiliary power source is needed.

3.2.3 Grounding Methods

A single point grounding system per the "Federal Information Processing Standards Publication 94" must be installed. The requirements are:

- Floor substructure must be attached to building ground or to ground rods driven through the slab to the appropriate depth. In some cases, the floor substructure may be attached to the building steel to provide grounding.
- Power Distribution Units (PDUs) and other electrical equipment must have a grounding strap attached to the floor substructure to dissipate electrostatic buildup.

3.3 Heating, Ventilation, and Air Conditioning

Based on the class of processors planned for Release A, chilled water lines will not be required to cool these systems. Conditioned air should be supplied under the floor with the raised computer room floor acting as the plenum. The conditioned air should be at positive pressure; equipment and console cooling should be supplied directly from the plenum or from louvered vents built into the raised floor panels. Ambient room temperatures in the range of 72° + or - 2° (F) and relative humidity in the range of 50% + or - 5% non condensing, are required to be maintained by the facilities. Cooling requirements for each site's equipment are shown in Appendix A. These requirements are based solely upon equipment and do not include the heating or cooling required for personnel, GFE, and physical space.

3.4 Space Requirements

3.4.1 Computer Room

Raised-floor space requirements were computed using the footprint of representative equipment plus clearances of 72 inches and 36 inches for maintenance access. An additional 15 percent for aisle space was calculated into the total raised-floor area. Raised-floor space requirements are for equipment only and do not include offices, common use areas, control room, spare parts or maintenance (technical) rooms, etc. These maintenance clearances were honored in most cases except for the MSFC site due to a small computer room. The space requirements for each site are shown in Table 3.4.1-1 below:

Table 3.4.1-1. Computer Room Square Foot Requirements By Site

Site / Release	Release IR-1	Release A	Total SQ. FT. at A
GSFC	302	3321	3623
MSFC	231	1768	1999
LaRC	309	1967	2276
EDC	288	129	417

The following are computer room raised-floor requirements:

- Substructure/bolt-on stringers must be durable, secure, and maintain good electrical continuity.
- Floor panels must be capable of supporting a concentrated point load of 1,000 pounds and a uniform live load of 250 pounds per square foot.
- Floor air flow panels must be perforated and allow for distribution of air from the down-flow air conditioners. They should be supplied in the approximate ratio of 12-to-15 per 20-ton air conditioning unit.

3.4.2 Office Space

Appendix A identifies the permanent office space required for ECS contractor personnel.

3.4.3 Maintenance and Operations Space

The tables in Appendix A depicts the current ECS Contractor Team maintenance and operations personnel maximum staffing projections for common areas by functional area, site, and release.

3.4.4 Conference Rooms

The size of the planned ECS staff at GSFC, EDC, LaRC, and MSFC requires additional conference/meeting rooms be provided. If existing conference/meeting rooms at the DAACs may be scheduled by all tenants on an equal basis, the additional requirements will be less. See Appendix A for each DAAC's requirements.

3.4.5 Temporary Space

3.4.5.1 Installation, Integration and Test Requirements

A total of three additional 64 sq. ft. cubicles (not included in the Office Requirements table for each site shown in Appendix A) will be required to support the ECS teams during the scheduled Release installation, integration and testing. In addition, a small meeting room should be available to the team throughout their stay (providing for both work space and open storage overnight).

It is anticipated that "Tiger Teams" may be formed if required to work critical problems. Such teams may include local DAAC and ECS personnel and off-site vendor and ECS contractor personnel. A dedicated conference / meeting room, during the initial high activity period and the three additional cubicles identified above should suffice to satisfy their needs.

3.4.6 ECS Library Requirements

Dedicated libraries are not required at the DAACs if adequate space exists within the existing library to accommodate ECS technical documentation. Library space requirements for this documentation include 200 sq. ft. at EDC, LaRC, and MSFC. Space for two libraries has been allocated within the ECS GSFC work space.

3.4.7 Facsimile and Reproduction Facilities

It is assumed that each host DAAC will provide the necessary facsimile and reproduction resources (equipment, toner, and paper) to support both the ECS staff and the ECS library requirements.

3.5 Building Requirements

3.5.1 Building Security

It is our recommendation that the DAACs provide 24-hour, seven-day-a-week controlled access to the ECS facility. In addition, it is recommended that a card key security system be installed for access to the computer room, operations control room, data storage, archive and data ingest distribution areas.

In addition to building access requirements there will be other rooms that require a secure environment. This can be accomplished with cipher locks or other security means. These rooms include the following: spare parts room, technician room, UPS room, and the auxiliary power room. ECS sites must be in compliance with physical access requirements of the NASA Automated Information Security Handbook, NHB 2410.9A and the ECS Security Plan (CDRL 214).

3.5.2 Emergency Lighting

Emergency lighting is required to illuminate all areas to enable personnel to respond appropriately when utility power has been interrupted. Lighting should be sufficient to allow personnel to shut down the computer equipment.

3.5.3 Fire Protection

ECS equipment requires standard fire protection required for NASA computer facilities, defined by NHB 1700.1, V9, or the latest Federal fire protection standard in effect. The ECS design is compliant with fire protection requirements for office, computer room, and media archive areas. Fire protection must be in place to coincide with the site access times of the ECS contractor.

3.5.4 Environmental Monitoring

Environmental monitoring of the computer facility is necessary to provide early warning of humidity or temperature problems that could affect computer hardware operations. This is especially applicable in the robotics tape archive areas, where constant humidity, temperature, and dust control is required to extend the useful life of the storage media.

The monitoring system should act as a central control point and provide monitoring capability of all mechanical and electrical components of the facility. These monitoring systems should be connected to the environmental systems, such as smoke and fire detection and suppression, power systems, and CPU alarms. Water detection and security systems should also be tied into these monitoring and control systems.

Regardless of the type of detection system used, sensors should be placed to detect leaks from the most likely sources, such as air conditioners, chillers, manifolds, cooled water pipes and floor drains. Because of the large amount of cabling and electrical conductors under the raised floor, all leaks must be detected quickly, and the locations of the activated sensor must show on a centrally located control panel.

3.6 LAN Connectivity

ECS will use the existing V0 LAN infrastructure except for those DAACs that do not have adequate capacity in the communication devices (such as hubs) that form the LANs for Ir-1. The only location with this problem is the EDC site. The ECS contractor will provide the necessary cables to connect ECS hosts and workstations to hubs. It is each DAAC's responsibility to provide a "clear path" through existing ducts or cable trays in the ceiling or under the raised floor. ECS will install a FDDI backbone LAN for Release A at each DAAC. Ir-1 equipment will remain on the V0 LAN until it is transitioned to the FDDI backbone after Release A.

3.7 DAAC Activation Schedules

DAAC facility preparations must be completed to support ECS DAAC activation schedules. Key dates for site activation are shown in Table 2-2 below. To avoid the need for continuous updates to this document, dates are stated in terms relative to the planned integration and test date for each site.

Table 3-2. Key Site Activation Activities

Activity	From CSR Start Date (Weeks)	Duration (Days)
Facility Access Date	-18 to -14	N/A
Site Survey	-18 to -14	2
Site Preparation (If Needed)	-17 to -13	30
2d Site Survey(If Needed)	-13 to -9	2
LAN and Equipment Installation	-12 to -8	30
External Communications Installed	-12 to -8	N/A
CSR	0	N/A

4. Facility Diagrams

4.1 ECS Floor Plans

Preliminary floor plans using equipment footprints are contained in Appendix A. Actual locations on the floor will be coordinated with the DAACs. Floor plans for GSFC, EDC, MSFC and LaRC are based upon drawings provided by the Government. These diagrams will be updated in the site Installation Plans.

4.1.1 Equipment Layouts

The equipment is identified on the floor plans with an identification code. This code can be matched with the information in Table 4.1.1-1 to determine the type of equipment that is shown.

Table 4.1.1-1. Equipment ID Codes

ID Code	Ref Code	Description
1	ATL 2	EMASS ARCHIVE ROBOTICS MOD 2
2	ATL DR	Linear Mag Drv
3	ATL E	EMASS ARCHIVE ROBOTICS MOD E
4	CD	CD-ROM Encoder/Writer
5	CD ROM JUKE	CD-ROM Jukebox
6	DISK29	4.2 and 8.4 GB MULTI-DISK PACK
7	DISK4 SGI	SGI EXTERNAL 2GB DRIVE
8	DISK5 HP	HP DISK 5GB
9	DISK6 SUN	8.4 MULTI-DISK PACK
10	DISK9 R2	R2 9GB H.D. FOR SGI INDY
11	FDDI CONC	FDDI CONCENTRATOR 2914-04
12	FDDI SWITCH	ALANTEC POWER HUB 7000
13	HUB	CABLETRON ETHERNET HUB
14	HUB-10	10BASE-T INTELLIGENT HUB
15	MON20	SUN 20" COLOR MONITOR
16	NTP DR	NEW TAPE PRODUCT DRIVE
17	PRINTER 12	12PPM LASER PRINTER
18	PRNTR-COLOR	Color Printer-Laserjet
19	RAID-1 DEC	FOS RAID 12GB in RACKS
20	RAID-1 HP	RAID W/1-21 GB
21	RAID-1 SGI	RAID W/1-29 GB
22	RAID-1 SUN	RAID W/1-63 GB
23	RAID-2 HP	RAID w/1-42 GB
24	RAID-2 SGI	RAID w/30-59GB
25	RAID-3 SGI	RAID w/60 - 119GB
26	RAID-4 SGI	RAID w/120 - 299GB
27	ROUTER-FDDI	FDDI Router 7000
28	SCI PROC 1	SCI PROCESSOR W/1 CPU
29	SCI PROC 2	SCI PROCESSOR W/2 - 5 CPUS
30	SCI PROC 3	SCI PROCESSOR W/6 OR MORE CPUS
31	SRV ACM	SGI CHALLENGE L PROCESSOR
32	SRV BB	BULLETIN BOARD SERVER
33	SRV CM	CM SERVER
34	SRV CSS	COMM SERVER
35	SRV DAO	PROTO TYPE SRV DEC2100 5/250
36	SRV DIP1	DISTRIBUTION SRV SUN 20/712
37	SRV DMG	DMG SRV HP 9000 J SERIES
38	SRV DRP1	DBMS/FSMS SRV SGI CHALLENGE XL
39	SRV DRP2	DBMS/FSMS SRV SGI CHALLENGE DM
40	SRV DRP3	DOCUMENT SRV SUN 20/712
41	SRV FOS	DATA/REAL/FILE SRV IN SRV RACK
42	SRV ICL	INGEST SRV SGI CHALLENGE L
43	SRV MSS	COMM SERVER
44	SRV PLN	PLANNING SERVER SUN 20/71
45	SRV QUE	QUEING SERVER SUN 20/71
46	SRV RACK	SERVER RACK
47	SRV T	TYMESERV 1000 IRIG CAB NASA 36
48	SRV XTERM	X TERMINAL SERVER SUN 20/50
49	TERMINAL	X-TERMINAL
50	TP DR-3490	3490 Tbl Top Tp Drv
51	TP DR-4MM	4mm Tp Dr w/4 Drvs & Stkr.
52	TP DR-6250	1600/6250 BPI Tp Drv
53	TP STKR-8MM	TAPE STACKER (8mm)
54	WS-LRG	SGI INDY WS: 128MB, 10GB, CDROM
55	WS-MED	HP 715/64 WS: 64MB, 2GB, CDROM
56	WS-SM	SUN 20/50 WS: 64MB, 2GB, CDROM

4.2 Dedicated Functional Areas

4.2.1 Computer Room

This area contains the hardware supporting the information management and product generation functions (file servers, computers, supercomputers, and RAID storage.)

4.2.2 Data Ingest and Distribution Room

This area houses both the ingest and distribution hardware and the personnel who operate them, including the Archive Manager and the Data Distribution Technicians.

4.2.3 Robotics Tape Archive Room

This area contains the robotics tape archive equipment. It must be kept under stringent environmental conditions to ensure the longevity of the archived data. Once loaded and operational, it is expected to be an unmanned, low traffic area.

4.2.4 Climate Controlled Tape Storage Room

This is an area in which new tapes are stored and acclimated prior to loading into the robotics equipment. It must be maintained under the same environmental conditions as the robotics tape archival room to ensure the longevity of the tapes. Therefore, it should be located adjacent to the robotics tape archival room, with access from that room.

4.2.5 Control Room

This is the operations center for ECS DAACs. It is the work area for the majority of the operations staff, including the Resource Monitor, the QA/Production Monitor, the Data Specialists and the User Support personnel.

4.2.6 Tech Room

This is an area in which maintenance technicians run diagnostics and repair equipment.

4.2.7 Spare Parts Room

This is an area under the control of the logistics and maintenance personnel in which the spare parts (LRUs) are stored. It is adjacent to the maintenance Tech Room, with controlled access by authorized personnel only.

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Appendix A. Site-Specific Facility Requirements

A.1 GSFC Facility Requirements

A.1.1 Location

Goddard Space Flight Center (GSFC)
Building 32
Soil Conservation Road
Greenbelt, MD 20771

This facility will be shared with other NASA organizations at Goddard.

A.1.2 Key Site Activation Dates

Table A.1.2-1 identifies the activation dates for this site. These dates are based on the current ECS release implementation schedule at the time of this document release.

Table A.1.2-1. GSFC Site Activation Dates

Release	Preinstall Survey	LAN/Equip Installation	External Comm Links	Integ & Test
IR-1	9/95	11/95	11/95	1/96
A	2/96	4/96	4/96	10/96

A.1.3 Power

The electrical power loads for ECS equipment at GSFC are listed in Table A.1.3-1 ECS Equipment Power Requirements . These loads are based on the Release IR-1 and Release A equipment with the exception of the 2nd floor (FOS) which includes Release B. This power must be conditioned and protected from surges and spikes.

Table A.1.3-1. ECS Equipment Power Requirements (KVA) by Release

Site	Release IR-1	ReleaseA	Total KVA at A
GSFC Grnd Floor	0	34	34
GSFC 1st. Floor	14	28	42
GSFC 2nd. Floor	0	78	78

A.1.3.1 Uninterruptible Power Supply (UPS) Systems

Government-furnished UPS systems are required at all DAAC sites to support operation of critical equipment for 20 minutes. This will allow for a graceful shutdown and the backup of critical data. The required dates are the same as those for the facility inspection specified in the Key Site Activation Dates Table. Load requirements for these UPS systems are shown in Table A.1.3-1 .

A.1.3.2 Auxiliary Power

The Flight Operations Segment (FOS) at GSFC requires a Government-furnished backup/auxiliary power system. This auxiliary power system is required at the same time as the UPS system for FOS.

A.1.4 Heating, Ventilation, and Air Conditioning

Based on the class of processors currently planned for Release A, chilled water lines will not be required to cool these systems. Conditioned air should be supplied under the floor with the raised computer room floor acting as the plenum. The conditioned air should be at positive pressure; equipment and console cooling should be supplied directly from this plenum or from louvered vents built into the raised floor panels. Ambient room temperatures in the range of 72° + or - 2° Fahrenheit and relative humidity in the range of 50% + or - 5% non condensing, are required to be maintained by the respective facilities. Cooling requirements for equipment are shown in the ECS Cooling Requirements, Table A.1.4.1. These requirements are based solely upon equipment and do not include the heating or cooling required for personnel, GFE, and physical space.

Table A.1.4-1. ECS Cooling Requirements (BTU/HR)

Site	Release IR-1	Release A	Total BTU's at A
GSFC Grnd Floor	0	111504	111504
GSFC 1st. Floor	47200	92532	139732
GSFC 2nd. Floor	0	262304	262304

A.1.5 Raised-Floor Space

Table A.1.5-1 below provides the raised-floor space requirement for GSFC. Required raised-floor space was computed using the equipment footprint plus clearances of 72 inches and 36 inches for maintenance access. An additional 15 percent for aisle space was calculated into the total raised-floor area. Raised-floor space requirements do not include office, common use areas, control room, spare parts or maintenance (technical) rooms, etc.

Table A.1.5-1. ECS Equipment Space Requirements

Site	Release IR-1	Release A	Total Equip. Space at A
GSFC Grnd Floor	0	1092	1092
GSFC 1st. Floor	302	1123	1425
GSFC 2nd. Floor	0	1106	1106

A.1.6 Office Space

Table A.1.6-1 identifies the GSFC DAAC office space requirements for contractor personnel for IR-1 and Release A.

Table A.1.6-1. GSFC DAAC Office Requirements (Total Sq. Ft. and #s, by Type)

Site	Release IR-1	Release A
GSFC (Sq. Ft.)	328	1382
M@150	0	1
O@100	2	4
T@64	2	13

Notes:

Managers offices (M) are 150 sq. ft; Supervisor and Senior Technical offices (O) are 100 sq. ft; Technical, Clerical and Secretarial modular offices are 64 sq. ft.

Site total square footage reflects actual offices only, not aisles, hallways, etc. Experience with GSFC DAAC building design shows usable office space to be no more than 2/3 of total available floor space. Therefore, recommend multiplying above "total office sq. ft." by factor of 1.5 to get "total required square footage."

Table A.1.6-2 identifies the ECS contractor staffing projections and support office space requirements for the SMC and the Sustaining Engineering Organization (SEO) to Release IR-1 and Release A.

Table A.1.6-2. GSFC SMC/SEO Office Requirements (Total Sq. Ft. and #s, by Type)

Site	Release IR-1	Release A
GSFC (Sq. Ft.)	0	3542
M@150	0	5
O@100	0	10
T@64	0	28

Table A.1.6-3 identifies the ECS Contractor GSFC FOS office space requirements by release.

Table A.1.6-3. GSFC FOS Office Requirements (Total Sq. Ft. and #s; by Type)

Site	Release IR-1	Release A
GSFC (Sq. Ft.)	0	1134
M@150	0	1
O@100	0	6
T@64	0	6

A.1.6.1 Maintenance and Operations Space

Table A.1.6.1-1 depicts the current ECS Contractor Team maintenance and operations personnel maximum staffing projections for common areas by functional area for IR-1 and Release A.

Table A.1.6.1-1. Common Area Staffing Projections

Site	Release IR-1	Release A
GSFC		
Ops Control Room (1st Flr, *)	0	5
Ops Control Room (2nd Flr, FOS)	0	7
Maintenance Room (Gnd Flr)	0	1
Maintenance Room (1st Flr)	0	1
Maintenance Room (2nd Flr)	0	1
Data Ingest and Archive Room	0	2

Notes: Depicts the maximum number of personnel in common area during shift operations (normally "day" shift.)
 *GSFC 1st Flr Ops Control Rm includes both SMC and SDPS Ops positions. M&O Ops Concept includes the QA/Production Monitors and the User Services Staff operating within the Ops Control Room. No office space has been allocated for these functions.

A.1.6.2 Conference Room Requirements

A total of four (4) conference rooms have been negotiated within the ECS allocated work space at GSFC to support the ECS M&O organization.

A.1.6.3 ECS Library Requirements

Space for a library (SDPS library) has been negotiated within the ECS-allocated work space at GSFC.

A.1.6.4 Training

A.1.6.4.1 Training Facilities Required

The ECS Training Program requires availability of classrooms either at the DAACs or in the vicinity of the DAACs for the training of M&O personnel. Classroom spaces should be chosen to meet the following requirements:

- Adequate lighting for students (50 lumens per square foot at eye level recommended)
- Table space for each student to be able to use charts of at least 11"X17" in size
- Space per student necessary to provide a comfortable learning environment, and to comply with local, state and federal fire and safety regulations
- Standard classroom equipment (i.e., overhead projector, white board, etc.) provided from DAAC training resource pool or other local source

A.1.6.4.2 Schedule of Training Facilities Requirements

The need for training facilities at the DAACs will be sporadic from Release A CSR to the time of TRMM launch. From Release B CSR to AM-1 launch, however, the requirements for classroom training facilities will be more frequent and extensive.

A.1.6.4.3 Coordination of Non-Classroom Facilities for Training

Non-classroom spaces are also required for ECS training. Hands-on technical training will occur on equipment that exists in the operational environment, since a separate pool of equipment for training does not exist. It is not anticipated that equipment will be moved to separate spaces for such training.

The use of operational equipment will have to be scheduled to limit impact on operational commitments. For Release A, the use of equipment for training will have to be coordinated with needs for the same equipment for Algorithm Integration & Testing and Interface Testing. Hands-on training for subsequent releases will require similar coordination.

A.1.7 Host Organization Plans

A.1.7.1 Facility Availability

The GSFC DAAC is co-located with the ESDIS Project Office in the new EOSDIS facility, B-32, on the GSFC East Campus. The DAAC has delayed moving their V0 H/W into B-32 until Nov 95 because of instability of the chillers (no maintenance personnel are on duty during the night shift or on weekends.) This is the same time that Ir-1 is scheduled for installation into building 32. Although some of the original ECS requirements (e.g., the combined DAAC/SMC Operations Control Area) were deleted from the initial completion package for the building, work orders are being processed to provide for them prior to the installation of the Release A delivery. ESDIS is funding these work orders and has taken responsibility for them.

A.1.7.2 Space Allocations

ESDIS has allocated resources (office space and raised floor (computer H/W) space) to accommodate the GSFC DAAC projected V0 and ECS requirements. The DAAC's V0 raised floor space is separate from (no physical (wall) separation) but adjacent to the ECS (V1) space. As the V0 H/W is phased out and the ECS installation evolves, the demarcation between the two areas will become transparent. Working together, the GSFC DAAC and ECS M&O staff have made the most effective use of the allocated office resources to meet the DAAC's short term requirements while accounting for the DAAC and Project support requirements ECS has downstream. Similarly, they have cooperated to provide the V0 data distribution operation with a work area until Apr 96.

A.1.7.3 Resolution of Requirement Discrepancies

ESDIS controls and allocates the GSFC DAAC (V0 and ECS) and ECS ESDIS Project resources. To date (pending Change Order 2), the ECS office allocations supporting DAAC, ESDIS Project and FOS fall 4 cubicles short of projected requirements during the 2000 - 2002 timeframe. Otherwise, with some shuffling of cubicles between the DAAC and ESDIS Project support personnel, current allocations meet all ECS requirements.

A.1.8 LAN Connectivity

ECS will establish a FDDI backbone LAN at GSFC for Release A equipment. This backbone will support devices that are still on ethernet such as printers and workstations. The Ir-1 equipment will remain on the V0 network until it is transitioned onto the FDDI backbone

A.1.9 Facility Diagrams

Diagrams for the planned use of the GSFC facility at Release A are provided in Figures A.1.9-1 through A.1.9-4

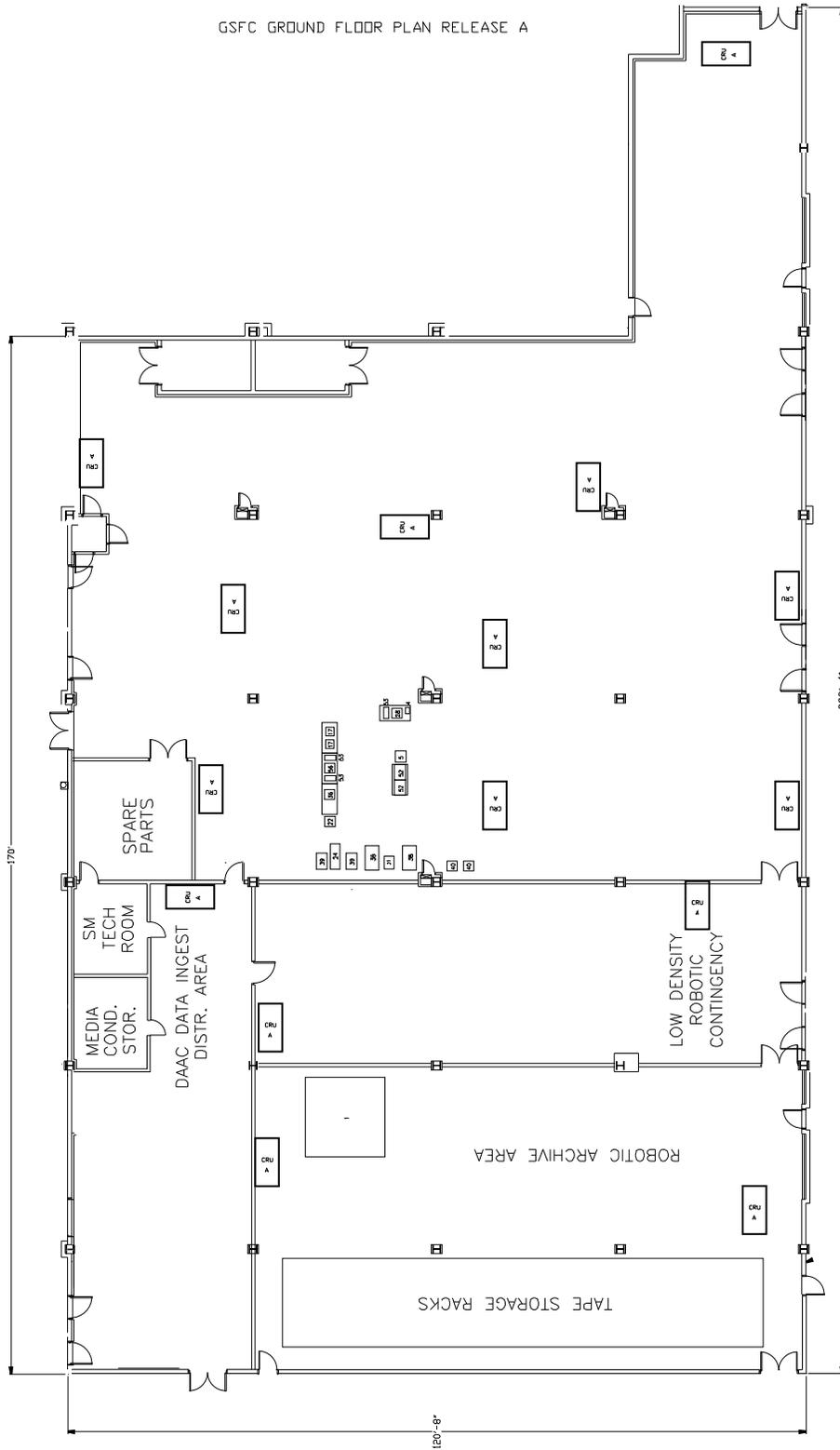


Figure A.1.9-1. GSFC Floor Plan — Ground Floor (Release A)

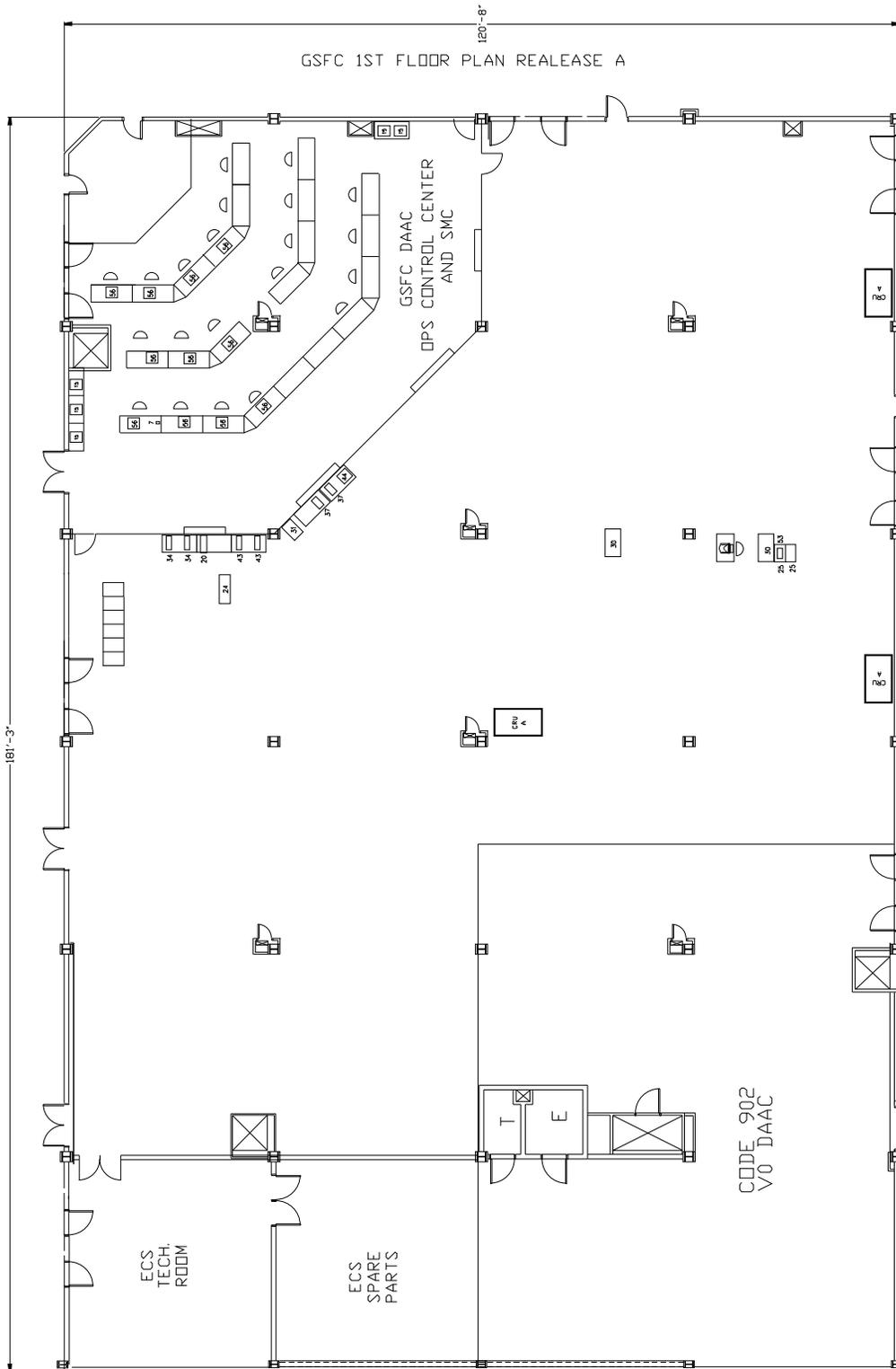


Figure A.1.9-2. GSFC Floor Plan — First Floor (Release A)

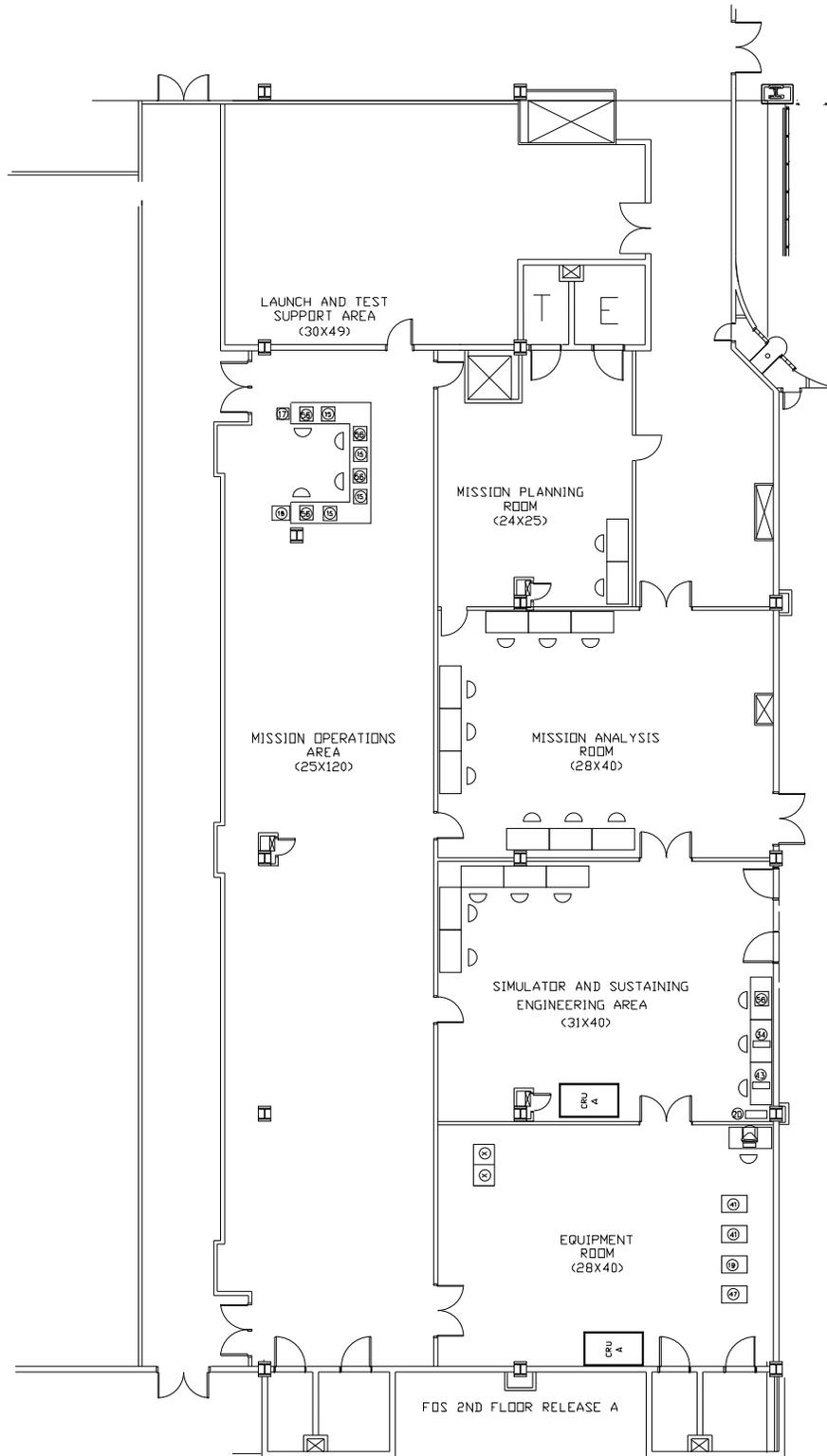


Figure A.1.9-3. FOS Floor Plan — Second Floor (Release A)

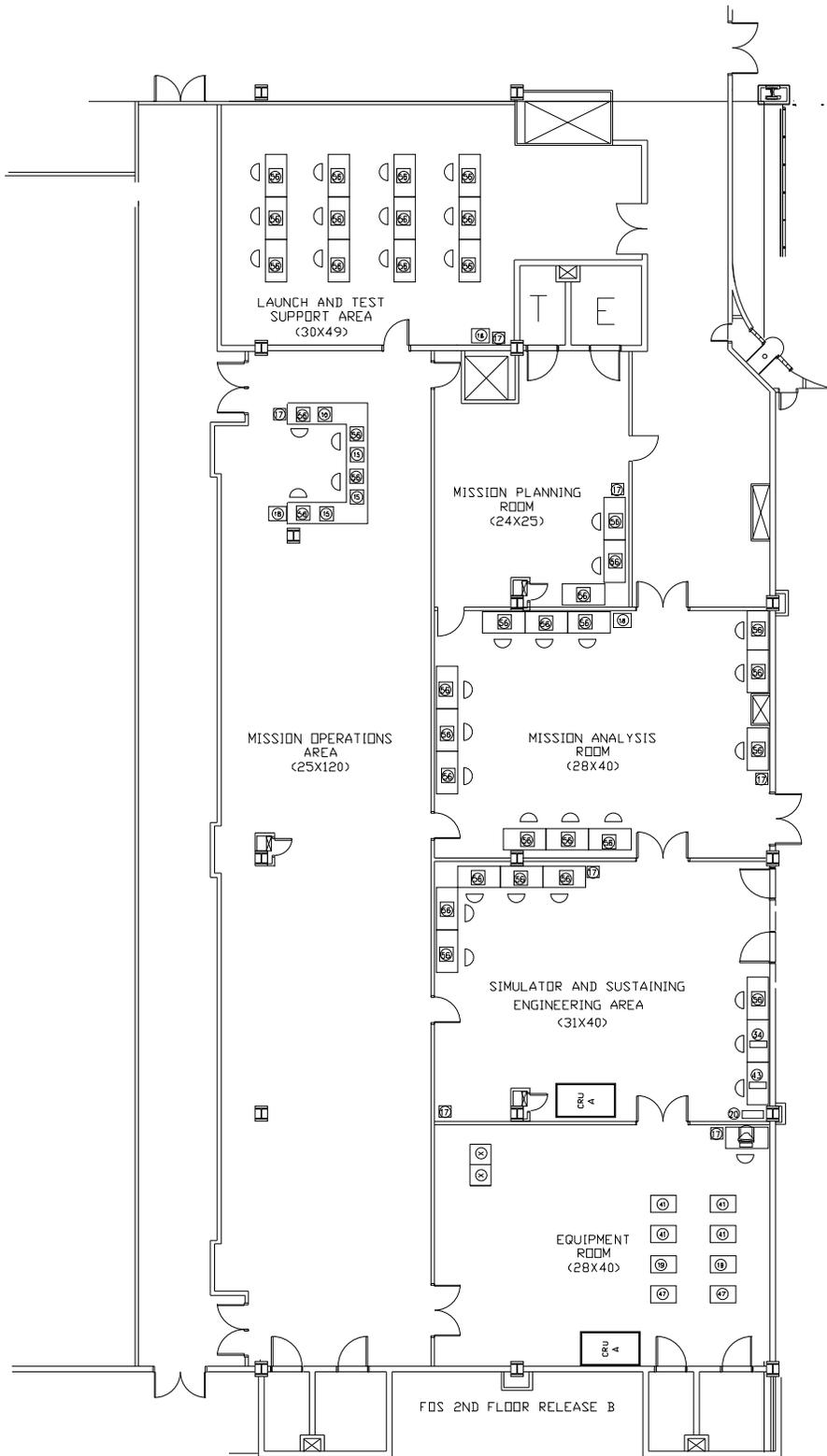


Figure A.1.9-4. FOS Floor Plan — Second Floor (Release B)

A.2 MSFC Facility Requirements

A.2.1 Location

Marshall Space Flight Center (MSFC)
NASA/MSFC GHCC

977 Explorer Blvd.
Huntsville, AL 35806

A.2.2 Key Site Activation Dates

Table A.2.2-1 identifies the activation dates for this site. These dates are based on the current ECS release implementation schedule at the time of this document release.

Table A.2.2-1. MSFC Site Activation Dates

Release	Preinstall Survey	LAN/Equip Installation	External Comm Links	Integ & Test
IR-1	10/95	11/95	11/95	1/96
A	2/96	4/96	4/96	10/96

A.2.3 Power

The electrical power loads for ECS equipment at MSFC are listed in Table A.2.3-1. These loads are based on the Release IR-1 and the Release A equipment. This power must be conditioned and protected from surges and spikes.

Table A.2.3-1. ECS Equipment Power Requirements (KVA)

SITE	RELEASE IR-1	RELEASE A	Total KVA at A
MSFC	8	50	58

A.2.3.1 Uninterruptible Power Supply (UPS) Systems

Government-furnished UPS systems are required at all DAAC sites to support operation of critical equipment for 20 minutes. This will allow for a graceful shutdown and the backup of critical data. The required dates are the same as those for facility inspection specified in the Key Site Activation Dates Table. Load requirements for these UPS systems are shown in Table A.2.3-1.

A.2.4 Heating, Ventilation, and Air Conditioning

Based on the class of processors currently planned for Release A, chilled water lines will not be required to cool these systems. Conditioned air should be supplied under the floor with the raised computer room floor acting as the plenum. The conditioned air should be at positive pressure; equipment and console cooling should be supplied directly from this plenum or from louvered vents built into the raised floor panels. Ambient room temperatures in the range of 72° + or

-2° Fahrenheit and relative humidity in the range of 50% + or - 5% non condensing, are required to be maintained by the respective facilities. Cooling requirements for equipment are shown in the ECS Cooling Requirements, Table A.2.4-1. These requirements are based solely upon equipment and do not include the heating or cooling required for personnel, GFE, and physical space.

Table A.2.4-1. ECS Cooling Requirements (BTU/HR)

SITE	Release IR-1	Release A	Total BTUs at A
MSFC	28409	159574	187983

A.2.5 Raised-Floor Space

Table A.2.5-1 below provides the raised-floor space requirement for MSFC. Required raised-floor space was computed using the equipment footprint plus clearances of 72 inches and 36 inches for maintenance access. An additional 15 percent for aisle space was calculated into the total raised-floor area. Raised-floor space requirements do not include office, common use areas, control room, spare parts or maintenance (technical) rooms, etc.

Table A.2.5-1. ECS Equipment Space Requirements

SITE	Release IR-1	Release A	Total Equip Space at A
MSFC	231	1768	1999

A.2.6 Office Space

Table A.2.6-1 identifies the MSFC DAAC office space requirements for contractor personnel for IR-1 and Release A.

Table A.2.6-1. Office Requirements (Total Sq. Ft. and #s, by Type)

Site	Release IR-1	Release A
MSFC	378	934
M@150	1	1
O@100	1	4
T@64	2	6

Notes:

Managers offices (M) are 150 sq. ft; Supervisor and Senior Technical offices (O) are 100 sq. ft; Technical, Clerical and Secretarial modular offices are 64 sq. ft.

Site total square footage reflects actual offices only, not aisles, hallways, etc. Experience with GSFC DAAC building design shows usable office space to be no more than 2/3 of total available floor space. Therefore, recommend multiplying above "total office sq. ft." by factor of 1.5 to get "total required square footage."

A.2.6.1 Maintenance and Operations Space

Table A.2.6.1-1 depicts the current ECS Contractor Team maintenance and operations personnel maximum staffing projections for common areas by functional area, and by release.

Table A.2.6.1-1. Common Area Staffing Projections

Site	Release IR-1	Release A
MSFC		
Ops Computer Room Floor	0	3
Maintenance Room	0	1

Notes: Depicts the maximum number of personnel in common area during shift operations (normally "day" shift.) M&O Ops Concept includes the QA/Production Monitors and the User Services Staff operating within the Ops Computer Room. No office space has been allocated for these functions.

A.2.6.2 Conference Room Requirements

The size of the planned ECS staff at MSFC requires that an additional conference room be added to whatever the DAAC had previously planned. This assumes that existing conference/meeting rooms at the DAACs may be scheduled by all tenants on an equal basis.

A.2.6.3 ECS Library Requirements

Dedicated libraries are not required at the DAACs if adequate space exists within the existing library to accommodate ECS technical documentation. Library space requirements for this documentation include 200 sq. ft. at MSFC .

A.2.6.4 Training

A.2.6.4.1 Training Facilities Required

The ECS Training Program requires availability of classrooms either at the DAACs or in the vicinity of the DAACs for the training of M&O personnel. Classroom spaces should be chosen to meet the following requirements:

- Adequate lighting for students (50 lumens per square foot at eye level recommended)
- Table space for each student to be able to use charts of at least 11"X17" in size
- Space per student necessary to provide a comfortable learning environment, and to comply with local, state and federal fire and safety regulations
- Standard classroom equipment (i.e., overhead projector, white board, etc.) provided from DAAC training resource pool or other local source

A.2.6.4.2 Schedule of Training Facilities Requirements

The need for training facilities at the DAACs will be sporadic from Release A CSR to the time of TRMM launch. From Release B CSR to project completion, however, the requirements for classroom training facilities will be more frequent and extensive.

A.2.6.4.3 Coordination of Non-Classroom Facilities for Training

Non-classroom spaces are also required for ECS training. Hands-on technical training will occur on equipment that exists in the operational environment, since a separate pool of equipment for training does not exist. It is not anticipated that equipment will be moved to separate spaces for such training.

The use of operational equipment will have to be scheduled to limit impact on operational commitments. For Release A, the use of equipment for training will have to be coordinated with needs for the same equipment for Algorithm Integration & Testing and Interface Testing. Hands-on training for subsequent releases will require similar coordination.

A.2.7 Host Organization Plans

A.2.7.1 Facility Availability

The MSFC DAAC currently occupies its permanent location, operating a V0 prototype in a stable environment.

A.2.7.2 Space Allocations

The proposed ECS Release A H/W layout which follows, fits into currently unoccupied space on the MSFC raised floor computer room, with one exception. The Release A data ingest and distribution equipment is colocated with the current V0 data distribution area. The remaining V0 H/W area will not be affected by ECS Release A equipment. Office space requirements, based upon projected staffing numbers, have been provided to the DAAC. They are still working the issue.

A.2.7.3 Resolution of Requirement Discrepancies

Preparation for IR-1 has demonstrated that an excellent working relationship currently exists between the MSFC DAAC and the ECS M&O Office. Any requirements discrepancies which cannot be worked out between them will be referred to the ESDIS Project for resolution.

A.2.8 LAN Connectivity

ECS will establish a FDDI backbone LAN at MSFC for Release A equipment. This backbone will support devices that are still on ethernet such as printers and workstations. The Ir-1 equipment will remain on the V0 network until it is transitioned onto the FDDI backbone

A.2.9 Facility Diagrams

The diagram for the planned use of the MSFC facility is provided in Figures A.2.9-1.

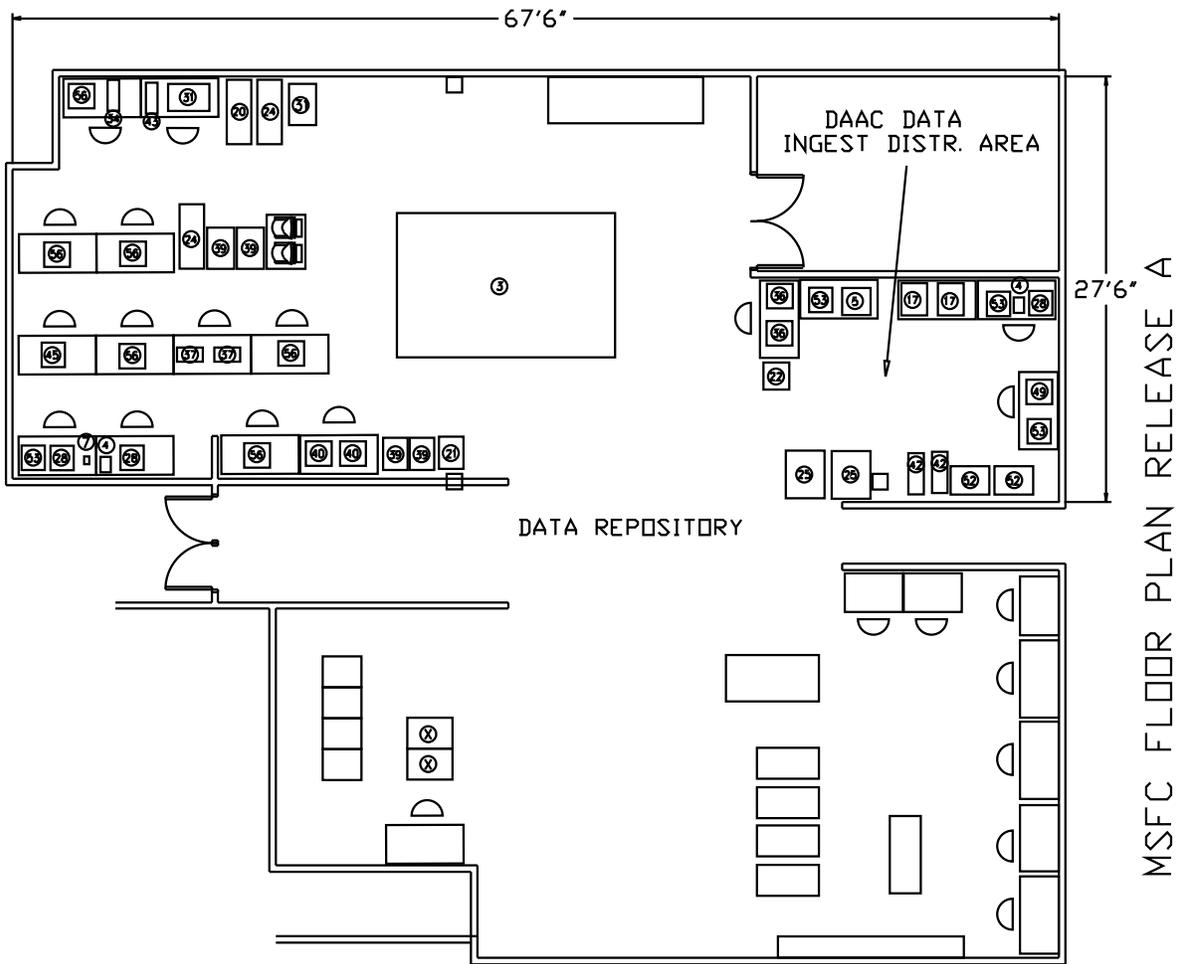


Figure A.2.9-1. MSFC Floor Plan (Release A)

A.3 EDC Facility Requirements

A.3.1 Location

Eros Data Center (EDC)
 Mundt Federal Building
 EDC Distributed Active Archive Center
 Sioux Falls, SD 57198

A.3.2 Key Site Activation Dates

Table A.3.2-1 identifies the activation dates for this site. These dates are based on the current ECS release implementation schedule at the time of this document release.

Table A.3.2-1. EDC Site Activation Dates

Release	Preinstall Survey	LAN/Equip Installation	External Comm Links	Integ & Test
IR-1	10/95	12/95	12/95	1/96
A	2/96	6/96	6/96	10/96

A.3.3 Power

The electrical power loads for ECS equipment at EDC are listed in Table A.3.3-1 ECS Equipment Power Requirements. These loads are based on the Release IR-1 and Release A equipment. This power must be conditioned and protected from surges and spikes.

Table A.3.3-1. ECS Equipment Power Requirements (KVA)

Site	Release IR-1	Release A	Total KVA at A
EDC	11	2	13

A.3.3.1 Uninterruptible Power Supply (UPS) Systems

Government-furnished UPS systems are required at all DAAC sites to support operation of critical equipment for 20 minutes. This will allow for a graceful shutdown and the backup of critical data. The required dates are the same as those for facility inspection specified in the Key Site Activation Dates Table. Load requirements for these UPS systems are shown in Table A.3.3-1.

A.3.4 Heating, Ventilation, and Air Conditioning

Based on the class of processors currently planned for Release A, chilled water lines will not be required to cool these systems. Conditioned air should be supplied under the floor with the raised computer room floor acting as the plenum. The conditioned air should be at positive pressure; equipment and console cooling should be supplied directly from this plenum or from louvered vents built into the raised floor panels. Ambient room temperatures in the range of 72° + or - 2° Fahrenheit and relative humidity in the range of 50% + or - 5% non condensing, are required to be maintained by the respective facilities. Cooling requirements for equipment are shown in the ECS Cooling Requirements, Table A.3.4-1. These requirements are based solely upon equipment and do not include the heating or cooling required for personnel, GFE, and physical space.

Table A.3.4-1. ECS Cooling Requirements (BTU/HR)

Site	Release IR-1	Release A	Total BTUs at A
EDC	37453	6300	43753

A.3.5 Raised-Floor Space

Table A.3.5-1 provides the raised-floor space requirement for EDC. Required raised-floor space was computed using the equipment footprint plus clearances of 72 inches and 36 inches for maintenance access. An additional 15 percent for aisle space was calculated into the total raised-floor area. Raised-floor space requirements do not include office, common use areas, control room, spare parts or maintenance (technical) rooms, etc.

Table A.3.5-1. ECS Equipment Space Requirements

Site	Release IR-1	Release A	Total Equip. Space at A
EDC	288	129	417

Notes: Workstations that reside in offices, control rooms, maintenance rooms, and related areas were excluded from this table. Included were equipment footprint and maintenance area around equipment.

A.3.6 Office Space

Table A.3.6-1 identifies the EDC DAAC office space requirements for contractor personnel for IR-1 and Release A.

Table A.3.6-1. Office Requirements (Total Sq. Ft. and #s, by Type)

Site	Release IR-1	Release A
EDC (Sq. Ft.)	300	428
M@150	2	2
O@100	0	0
T@64	2	2

Notes:

Managers offices (M) are 150 sq. ft; Supervisor and Senior Technical offices (O) are 100 sq. ft; Technical, Clerical and Secretarial modular offices are 64 sq. ft.

Site total square footage reflects actual offices only, not aisles, hallways, etc. Experience with GSFC DAAC building design shows usable office space to be no more than 2/3 of total available floor space. Therefore, recommend multiplying above "total office sq. ft." by factor of 1.5 to get "total required square footage."

A.3.6.1 Maintenance and Operations Space

Table A.3.6.1-1 depicts the current ECS Contractor Team maintenance and operations personnel maximum staffing projections for common areas by functional area, and by release.

Table A.3.6.1-1. Common Area Staffing Projections

Site	Release IR-1	Release A
EDC		
Ops Control Room	0	0
Data Ingest and Archive Room	0	0
Maintenance Room	0	0

Notes: Depicts the maximum number of personnel in common area during shift operations (normally "day" shift.) M&O Ops Concept includes the QA/Production Monitors and the User Services Staff operating within the Ops Control Room. No office space has been allocated for these functions.

A.3.6.2 Conference Room Requirements

The size of the planned ECS staff at EDC requires that an additional conference room be added to whatever the DAAC had previously planned. This assumes that existing conference/meeting rooms at the DAACs may be scheduled by all tenants on an equal basis.

A.3.6.3 ECS Library Requirements

Dedicated libraries are not required at the DAACs if adequate space exists within the existing library to accommodate ECS technical documentation. Library space requirements for this documentation include 200 sq. ft. at EDC.

A.3.6.4 Training

A.3.6.4.1 Training Facilities Required

The ECS Training Program requires availability of classrooms either at the DAACs or in the vicinity of the DAACs for the training of M&O personnel. Classroom spaces should be chosen to meet the following requirements:

- Adequate lighting for students (50 lumens per square foot at eye level recommended)
- Table space for each student to be able to use charts of at least 11"X17" in size
- Space per student necessary to provide a comfortable learning environment, and to comply with local, state and federal fire and safety regulations
- Standard classroom equipment (i.e., overhead projector, white board, etc.) provided from DAAC training resource pool or other local source

A.3.6.4.2 Schedule of Training Facilities Requirements

The need for training facilities at the DAACs will be sporadic from Release A CSR to the time of TRMM launch. From Release B CSR to project completion, however, the requirements for classroom training facilities will be more frequent and extensive.

A.3.6.4.3 Coordination of Non-Classroom Facilities for Training

Non-classroom spaces are also required for ECS training. Hands-on technical training will occur on equipment that exists in the operational environment, since a separate pool of equipment for training does not exist. It is not anticipated that equipment will be moved to separate spaces for such training.

The use of operational equipment will have to be scheduled to limit impact on operational commitments. For Release A, the use of equipment for training will have to be coordinated with needs for the same equipment for Algorithm Integration & Testing and Interface Testing. Hands-on training for subsequent releases will require similar coordination.

A.3.7 Host Organization Plans

A.3.7.1 Facility Availability

The EDC DAAC currently operates a V0 prototype in a stable environment in a temporary location within the EDC. The DAAC is scheduled to occupy its permanent location (within a new wing of the EDC facility) before the scheduled installation of ECS Release A H/W in 6/96.

A.3.7.2 Space Allocations

The ECS M&O Office has been working with EDC management as they lay out their new facility. In addition to providing currently projected ECS equipment and office space requirements, ideas have been shared on potential Operations Center layouts.

A.3.7.3 Resolution of Requirement Discrepancies

Since Release A provides only a small increase in H/W and no staffing increase, no discrepancies currently exist or are anticipated. Preparation for IR-1 has demonstrated that an excellent working relationship currently exists between the EDC DAAC and the ECS M&O Office. Any requirements discrepancies which cannot be worked out between them will be referred to the ESDIS Project for resolution.

A.3.8 LAN Connectivity

ECS will establish a FDDI backbone LAN at EDC for Release A equipment. This backbone will support devices that are still on ethernet such as printers and workstations. The Ir-1 equipment will remain on the V0 network until it is transitioned onto the FDDI backbone

A.3.9 Facility Diagrams

The diagram for the planned use of the EDC facility is provided in Figure A.3.9-1

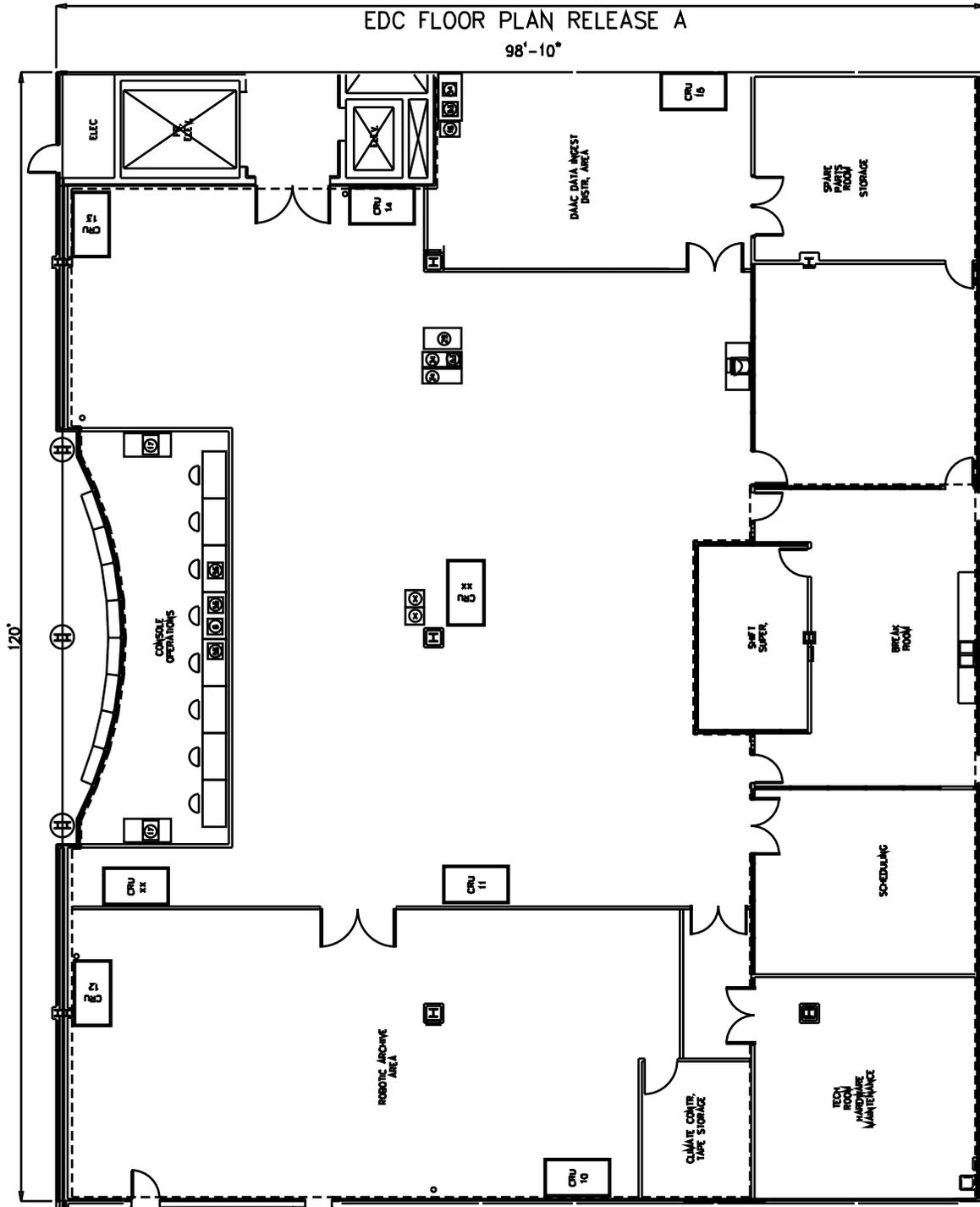


Figure A.3.9-1. EDC Floor Plan (Release A)

A.4 LaRC Facility Requirements

A.4.1 Location

NASA Langley Research Center (LaRC)
Building 1268B
24 West Taylor Street
Hampton, VA 23681-0001

A.4.2 Key Site Activation Dates

Table A.4.2-1 identifies the activation dates for this site. These dates are based on the current ECS release implementation schedule at the time of this document release.

Table A.4.2-1. LaRC Site Activation Dates

Release	Preinstall Survey	LAN/Equip Installation	External Comm Links	Integ & Test
IR-1	10/95	11/95	11/95	1/96
A	2/96	5/96	5/96	10/96

A.4.3 Power

The electrical power loads for ECS equipment at LaRC are listed in Table A.4.3-1 ECS Equipment Power Requirements. These loads are based on the Release IR-1 and Release A equipment. This power must be conditioned and protected from surges and spikes.

Table A.4.3-1. ECS Equipment Power Requirements (KVA)

Site	Release IR-1	Release A	Total KVA at A
LaRC	15	65	80

A.4.3.1 Uninterruptible Power Supply (UPS) Systems

Government-furnished UPS systems are required at all DAAC sites to support operation of critical equipment for 20 minutes. This will allow for a graceful shutdown and the backup of critical data. The required dates are the same as those for facility inspection specified in the Key Site Activation Dates Table. Load requirements for these UPS systems are shown in Table A.4.3-1.

A.4.4 Heating, Ventilation, and Air Conditioning

Based on the class of processors currently planned for Release A, chilled water lines will not be required to cool these systems. Conditioned air should be supplied under the floor with the raised computer room floor acting as the plenum. The conditioned air should be at positive pressure; equipment and console cooling should be supplied directly from this plenum or from louvered vents built into the raised floor panels. Ambient room temperatures in the range of 72° + or - 2° Fahrenheit and relative humidity in the range of 50% + or - 5% non condensing, are required to be maintained by the respective facilities. Cooling requirements for equipment are shown in the ECS Cooling Requirements, Table A.4.4-1. These requirements are based solely upon equipment and do not include the heating or cooling required for personnel, GFE, and physical space.

Table A.4-4.1. ECS Cooling Requirements (BTU/HR)

Site	Release IR-1	Release A	Total BTUs at A
LaRC	51982	216445	268427

A.4.5 Raised-Floor Space

Table A.4.5-1 provides the raised-floor space requirement for LaRC. Required raised-floor space was computed using the equipment footprint plus clearances of 72 inches and 36 inches for maintenance access. An additional 15 percent for aisle space was calculated into the total raised-floor area. Raised-floor space requirements do not include office, common use areas, control room, spare parts or maintenance (technical) rooms, etc.

Table A.4.5-1. ECS Equipment Space Requirements

Site	Release IR-1	Release A	Total Equip. Space at A
LaRC	277	2270	2547

Notes: Workstations that reside in offices, control rooms, maintenance rooms, and related areas were excluded from this table. Included were equipment footprint and maintenance area around equipment.

A.4.6 Office Space

Table A.4.6-1 identifies the LaRC DAAC office space requirements for contractor personnel for IR-1 and Release A.

Table A.4.6-1. Office Requirements (Total Sq. Ft. and #s, by Type)

Site	Release IR-1	Release A
EDC (Sq. Ft.)	428	2025
M@150	2	1
O@100	0	3
T@64	2	25

Notes:

Managers offices (M) are 150 sq. ft; Supervisor and Senior Technical offices (O) are 100 sq. ft; Technical, Clerical and Secretarial modular offices are 64 sq. ft.

Site total square footage reflects actual offices only, not aisles, hallways, etc. Experience with GSFC DAAC building design shows usable office space to be no more than 2/3 of total available floor space. Therefore, recommend multiplying above "total office sq. ft." by factor of 1.5 to get "total required square footage."

A.4.6.1 Maintenance and Operations Space

Table A.4.6.1-1 depicts the current ECS Contractor Team maintenance and operations personnel maximum staffing projections for common areas by functional area, and by release.

Table A.4.6.1-1. Common Area Staffing Projections

Site	Release IR-1	Release A
LaRC		
Ops Control Room	0	4
Data Ingest and Archive Room	0	4
Maintenance Room	0	1

Notes: Depicts the maximum number of personnel in common area during shift operations (normally "day" shift.) M&O Ops Concept includes the QA/Production Monitors and the User Services Staff operating within the Ops Control Room. No office space has been allocated for these functions.

A.4.6.2 Conference Room Requirements

The size of the planned ECS staff at LaRC requires that an additional conference room be added to whatever the DAAC had previously planned. This assumes that existing conference/meeting rooms at the DAACs may be scheduled by all tenants on an equal basis.

A.4.6.3 ECS Library Requirements

Dedicated libraries are not required at the DAACs if adequate space exists within the existing library to accommodate ECS technical documentation. Library space requirements for this documentation include 200 sq. ft. at LaRC.

A.4.6.4 Training

A.4.6.4.1 Training Facilities Required

The ECS Training Program requires availability of classrooms either at the DAACs or in the vicinity of the DAACs for the training of M&O personnel. Classroom spaces should be chosen to meet the following requirements:

- Adequate lighting for students (50 lumens per square foot at eye level recommended)

- Table space for each student to be able to use charts of at least 11"X17" in size
- Space per student necessary to provide a comfortable learning environment, and to comply with local, state and federal fire and safety regulations
- Standard classroom equipment (i.e., overhead projector, white board, etc.) provided from DAAC training resource pool or other local source

A.4.6.4.2 Schedule of Training Facilities Requirements

The need for training facilities at the DAACs will be sporadic from Release A CSR to the time of TRMM launch. From Release B CSR to project completion, however, the requirements for classroom training facilities will be more frequent and extensive.

A.4.6.4.3 Coordination of Non-Classroom Facilities for Training

Non-classroom spaces are also required for ECS training. Hands-on technical training will occur on equipment that exists in the operational environment, since a separate pool of equipment for training does not exist. It is not anticipated that equipment will be moved to separate spaces for such training.

The use of operational equipment will have to be scheduled to limit impact on operational commitments. For Release A, the use of equipment for training will have to be coordinated with needs for the same equipment for Algorithm Integration & Testing and Interface Testing. Hands-on training for subsequent releases will require similar coordination.

A.4.7 Host Organization Plans

A.4.7.1 Facility Availability

The LaRC DAAC currently operates a V0 prototype in a stable environment in their current location. The DAAC is scheduled to occupy its permanent location (within a new wing of the LaRC facility) before the scheduled installation of ECS Release A H/W in 5/96. In fact, there is a possibility that the new facility may be ready for installation of the IR-1 H/W in Nov 95.

A.4.7.2 Space Allocations

The ECS M&O Office has been working with LaRC management as they lay out their new facility. In addition to providing currently projected ECS equipment and office space requirements, ideas have been shared on potential IR-1 layouts, considering several options for the installation of IR-1 H/W.

A.4.7.3 Resolution of Requirement Discrepancies

Preparation for IR-1 has demonstrated that an excellent working relationship currently exists between the LaRC DAAC and the ECS M&O Office. Any requirements discrepancies which cannot be worked out between them will be referred to the ESDIS Project for resolution.

A.4.8 LAN Connectivity

ECS will establish a FDDI backbone LAN at LaRC for Release A equipment. This backbone will support devices that are still on ethernet such as printers and workstations. The Ir-1 equipment will remain on the V0 network until it is transitioned onto the FDDI backbone

A.4.9 Facility Diagrams

The diagram for the planned use of the LaRC facility is provided in Figure A.4.9-1

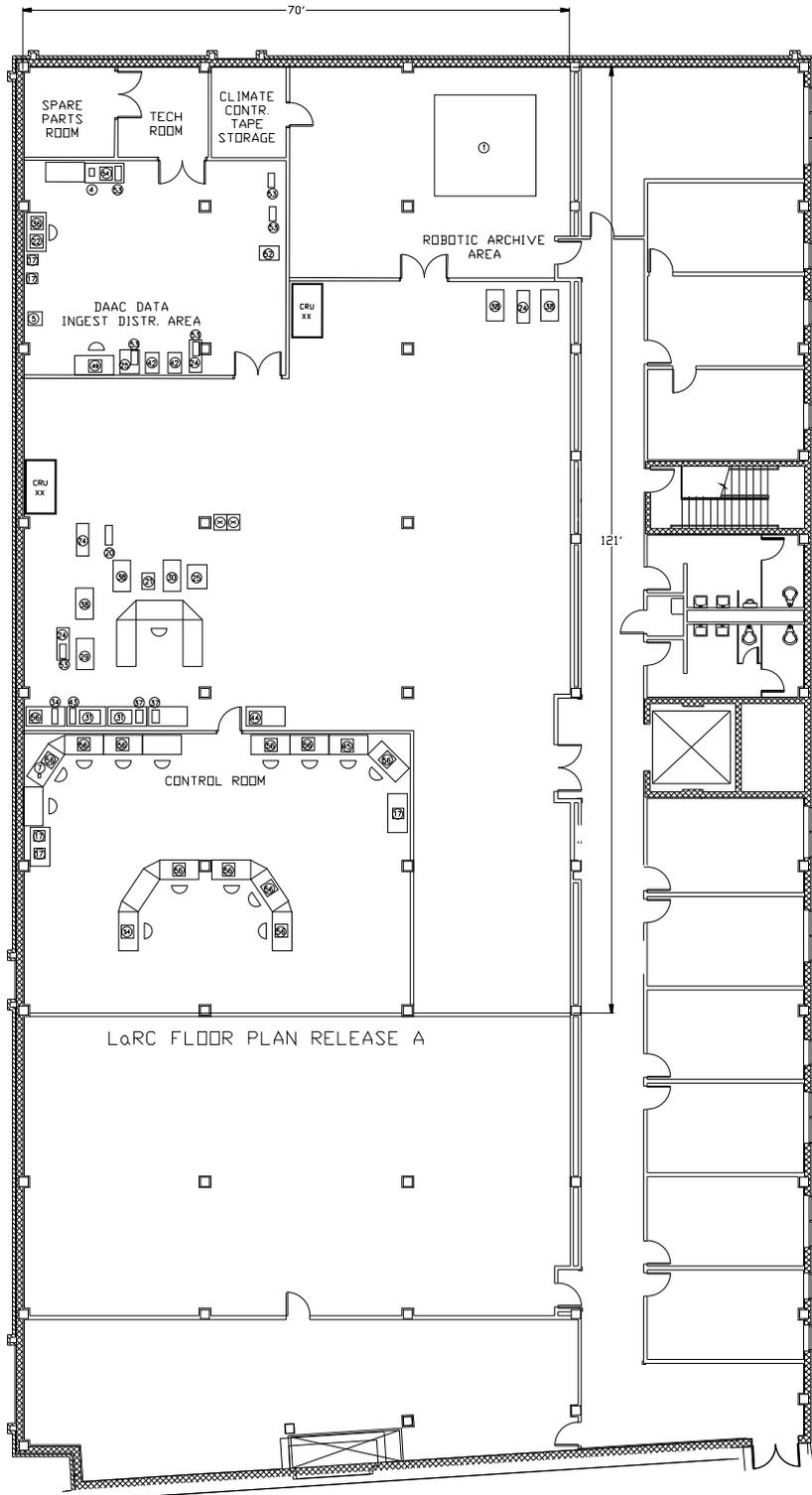


Figure A.4.9-1. LaRC Floor Plan (Release A)

Abbreviations and Acronyms

ASF	Alaska SAR Facility
BODs	beneficial occupancy dates
BTU	British thermal unit
CRUs	Computer Room Units
CACU	cooling and air-conditioning units
CPU	central processing unit
CSMS	Communications and Systems Management Segment
DADS	Data Archive and Distribution System
DAAC	Distributed Active Archive Center
DCN	Document Change Notice
DID	Data Item Description
ECL	External Communications Links
ECS	EOSDIS Core System
EDC	EROS Data Center
EOC	EOS Operations Center (ECS)
EOS	Earth Observing System
ESN	EOSDIS Science Network (ECS)
FIPS	Federal Information Processing Standards
FOS	Flight Operations Segment
GSFC	Goddard Space Flight Center
I&T	Integration and Testing
JPL	Jet Propulsion Laboratory
L&EI	LAN and Equipment Installation
LAN	Local Area Network
LaRC	Langley Research Center
M&O	Maintenance and Operations
MSFC	Marshall Space Flight Center
NSI	NASA Science Internet

NSIDC	National Snow and Ice Data Center
ORNL	Oak Ridge National Laboratory
PSCN	Program Support Communication Network
QA	Quality Assurance
RMA	Reliability, Maintainability, and Availability
RRR	Release Readiness Review
SCF	Science Computing Facility
SDPS	Science Data Processing Segment
SOW	Statement of Work
SP	Site Preparation
SEO	Sustaining Engineering Organization
TBD	To Be Determined
TL	Team Leader
TM	Team Members
TRMM	Tropical Rainfall Measuring Mission (joint US-Japan)
UPS	Uninterruptible power supply
WAN	Wide Area Network