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SEGMENT SPECIFICATION
FOR THE
USER SEGMENT (US)
OF THE
DEFENSE METEOROLOGICAL SATELLITE PROGRAM (DMSP)

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COL USAF
PROCURING ACTIVITY

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1. SCOPE

1.1 Identification. This System/Segment Specification establishes the requirements for the User Segment (US) of the Defense Meteorological Satellite Program (DMSP) System.

1.2 Purpose. The purpose of the DMSP System is to gather environmental data on a world-wide basis in support of Strategic and Tactical military operations. The US provides for the ingest and preliminary processing of this environmental data in support of those organizations/agencies responsible for further processing/interpretation and use of the data.

1.3 Introduction. This document establishes the operational and interface requirements for the US. These requirements are divided into functional areas that have their own set of requirements. The interfaces addressed in this document pertain to the transfer of control and informational data between functional areas and points of interface with other DMSP System Segments.

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2. APPLICABLE DOCUMENTS

2.1 Government Documents. The following documents of the exact issue shown form a part of this specification to the extent specified herein. In the event of conflict between the documents referenced herein and the contents of this specification, see 3.6

SPECIFICATIONS:

Military:

MIL-E-4158E General Requirements for Electronic Equipment
11 JAN 73 Ground
Amendment 3
31 DEC 85

MIL-P-90246 Packaging, Handling, and Transportability in
06 JUN 72 System/Equipment Acquisition

Other Government Agencies:

DMSP-300 General System Performance Specification for the
DMSP

IS-YD-853 DMSP Space Segment to Strategic Ground Segment
(SGS) Interface Specification

IS-YD-861 Interface Specification Command, Control &
Communications (C3) Segment to US for the DMSP

IS-YD-862 Interface Specification US to Strategic Customer

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SS-YD-855-01 **Segment Specification for the US Strategic
Function of the DMSP**

SS-YD-855-02 **Segment Specification for the US Tactical
Function of the DXS?**

HGSG 142054 **Interface Specification Television Infrared
Observation Satellite Series N (TIROS-N)**

STANDARDS:**Military:**

MIL-STD-129J **Marking for Shipment and Storage**
25 SEP 84
Notice 1
05 NOV 86

MIL-STD-130F **Identification Marking of United States Military
Property**
21 MAY 82

MIL-STD-454K **Standard General Requirements for Electronic
Equipment**
14 FEB 85
Notice 1
, 29 AUG 86

MIL-STD-461B **Electromagnetic Emission and Susceptibility
Requirements for the Control of Electromagnetic
interference**

MIL-STD-756B **Reliability Modeling and Prediction**
18 nov 81

11 JAN 38

MIL-STD-14720 **Human Engineering Design Criteria for Military
02 MAY 81 Systems, Equipment & Facilities**

MIL-STD-1510A **Procedures for Use of Container Design
28 FEB 75 Retrieval System**

MIL-STD-1542 **Electromagnetic Compatibility (EMC) and
15 APR 74 Grounding Requirements for Space Systems
Facilities
Notice 1
31 AUG 82**

OTHER PUBLICATIONS:

Manuals:

AFGWC **All Combined Operator's Information Listing
(ACCOIL) User's Manual**

Copies of specifications, standards, drawings, and publications required by suppliers in connection with specified procurement functions should be obtained from the contracting agency or as directed by the contracting officer.

2.2 Non-Government Documents. The following documents of the exact issue shown form a part of this specification to the extent specified herein. In the event of conflict between the documents referenced herein and the contents of this specification, the contents of this specification shall be considered a superseding requirement.

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STANDARDS:

ANSI Y32.16a-1970 Reference Designation for Electrical and
Electronic Parts and Equipment

IS-2285557 Interface Specification TIROS-N Ground System
REVs A,B,C
REV H APR 1982

Technical society and technical association
specifications and standards are generally available for reference
from libraries. They are also distributed among technical groups and
using Federal agencies.

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REQUIREMENTS

3.i System Definition. The DMSP User Segment (US) consists of the ground based facilities used to ingest, process and display DMSP environmental data. These facilities include Site III at Offutt Air Force Base (AFB) Nebraska, the Mark III and Mark IV tactical terminals. Equipment located at Fleet Numerical Oceanography Center (FNOC) and the shipboard terminals are not a part of the DMSP US. Data multiplexing equipment and interfaces to the domestic communication satellite (DOMSAT) located in Site III are a part of the C3 Segment. Figure 3.1-1 illustrates the relationship of elements within the DMSP system. The DMSP Space, User, and C3 Segments are shown within the areas indicated. External agencies/systems associated with DMSP but not directly a part of the DMSP system are shown outside of these areas. Figure 3.1-2 illustrates which items are within the US and which associated data routing items are external to the US.

3.1.1 Missions. The US shall provide both strategic and tactical support of Department of Defense (DoD) operations through the timely ingest, processing, and dissemination of DMSP environmental data. Strategic operations shall be conducted at Site III. Tactical operations shall be conducted using transportable terminals and/or permanent terminals that make use of the technology and equipment used in the transportable terminals.

The Strategic Mission shall be to ingest data and forward it to the Air Force Global Weather Central (AFGWC) Satellite Data Handling System (SDHS) and the UNISYS processing systems. This portion of the strategic mission shall also provide, upon request, high quality hard copy imagery data.

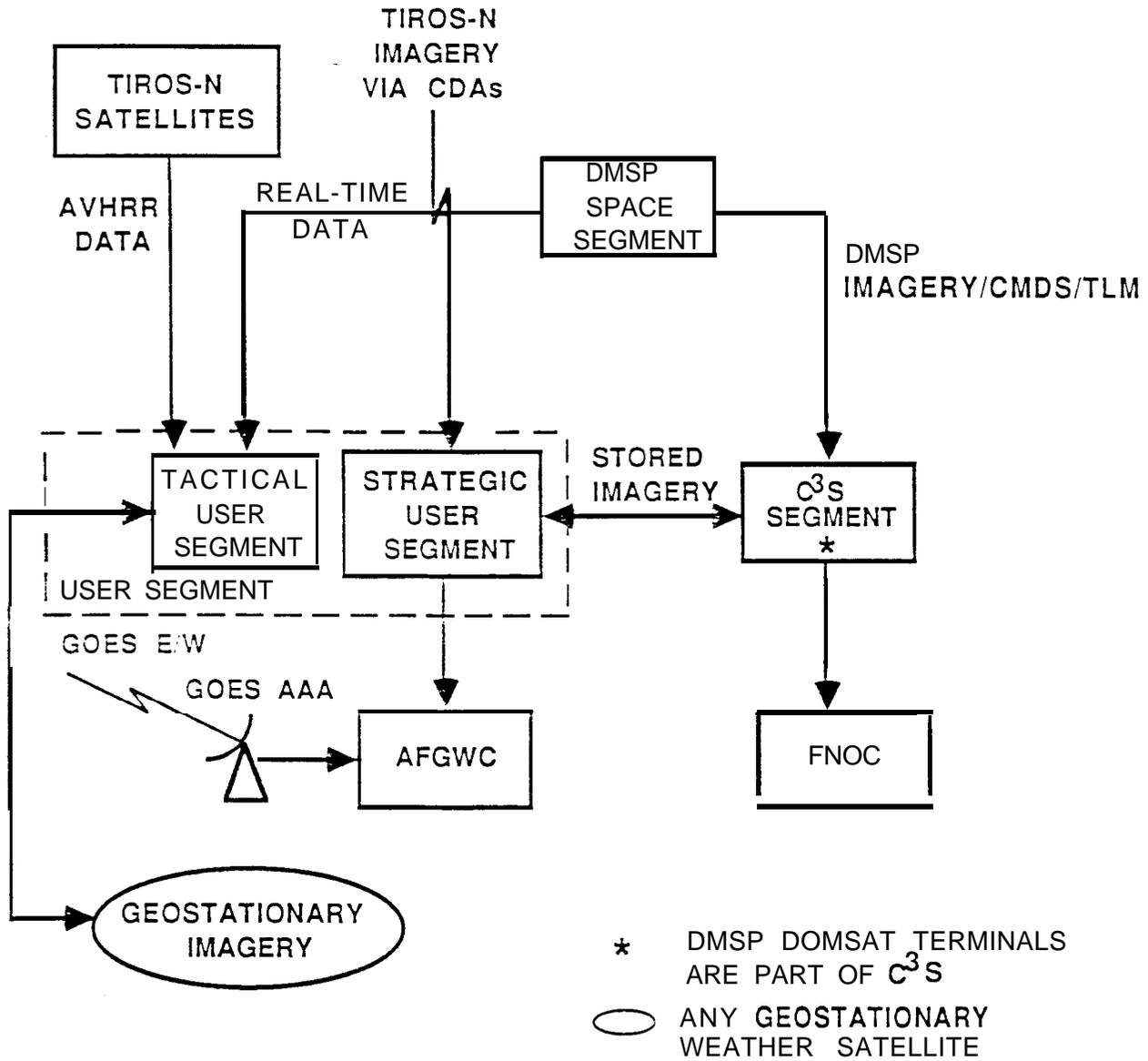


Figure 3.1-1 Segment to System/Subsystem Definition

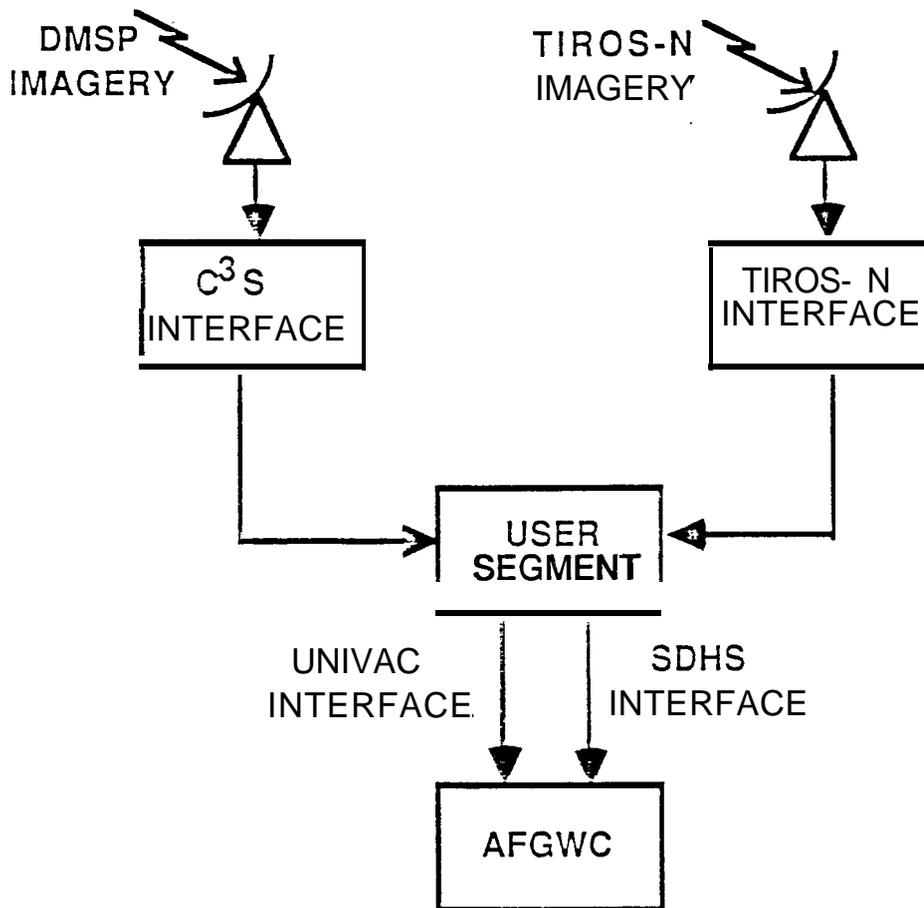


Figure 3.1-2 Site III Functional Definition

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The Tactical Mission shall consist of receipt and processing of real-time data (RTD) format DMS? data for use by forecasters in the field. These forecasts support field commanders in planning and executing both ground and air operations.

3.1.2 Threat. Refer to DMS-300 paragraph 3.1.3.

3.1.3 System Modes and States. The US shall have two modes of operation. The first mode provides for the acquisition, ingest and storage of DMS? and TIROS-N data. Note that acquisition is provided by DMS? C3 Segment remote stations and TIROS-N Command Data Acquisition Stations (CDAS) for the Strategic Function and directly from the DMS? and TIROS-N satellites for the Tactical Function. The second mode provides for the post-pass processing and display of DMS? RTD and TIROS-N data.

Mode 1 shall have the following operational states:

- a. Idle.
- b. Pass setup.
- c. Await start of data.
- d. Ingest data.
- e. Extract required data from data stream.
- f. Store Data.
- g. Route data to users/product generation equipment.
- h. Pass termination.
- i. Provide additional post-pass hard-copy product generation and recorded data support to users.

Mode 2 shall have the following operational states:

- a. Idle.
- b. Data recovery from storage media.

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- c. Generation of hard-copy **weather** products.
- d. **Generation of products on a User's Cathod Ray Tube (CRT) display.**

3.1.4 System Functions, The US shall provide the following functions:

3.1.4.1 Strategic Function. The Strategic Function shall be as specified in SS-YD-855-01.

3.1.4.2 Tactical Function. The Tactical Function shall be as specified in SS-YD-855-02.

3.1.5 System Functional Relationships. The relationship between US Functions, the C3 Segment, and the Space Segment shall be as shown in Figure 3.1.5-1.

3.1.5.1 Segment Allocation. The allocation of operational functions between the strategic and tactical functions is shown in Figure 3.1.5.1-1.

3.1.6 Configuration Allocation. Allocation of the Hardware Configuration Items (HWCI) and Computer Software Configuration Items (CSCI) shall be as specified in SS-YD-855-01 for the Strategic Function and SS-YD-355-02 for the Tactical Functions.

A specification tree for the US "A" level specifications is shown in Figure 3.1.6-1. The relationship between the HWCI's and CSCIs for the Strategic and Tactical Functions is provided in SS-YD-855-01 and SS-YD-855-02 respectively.

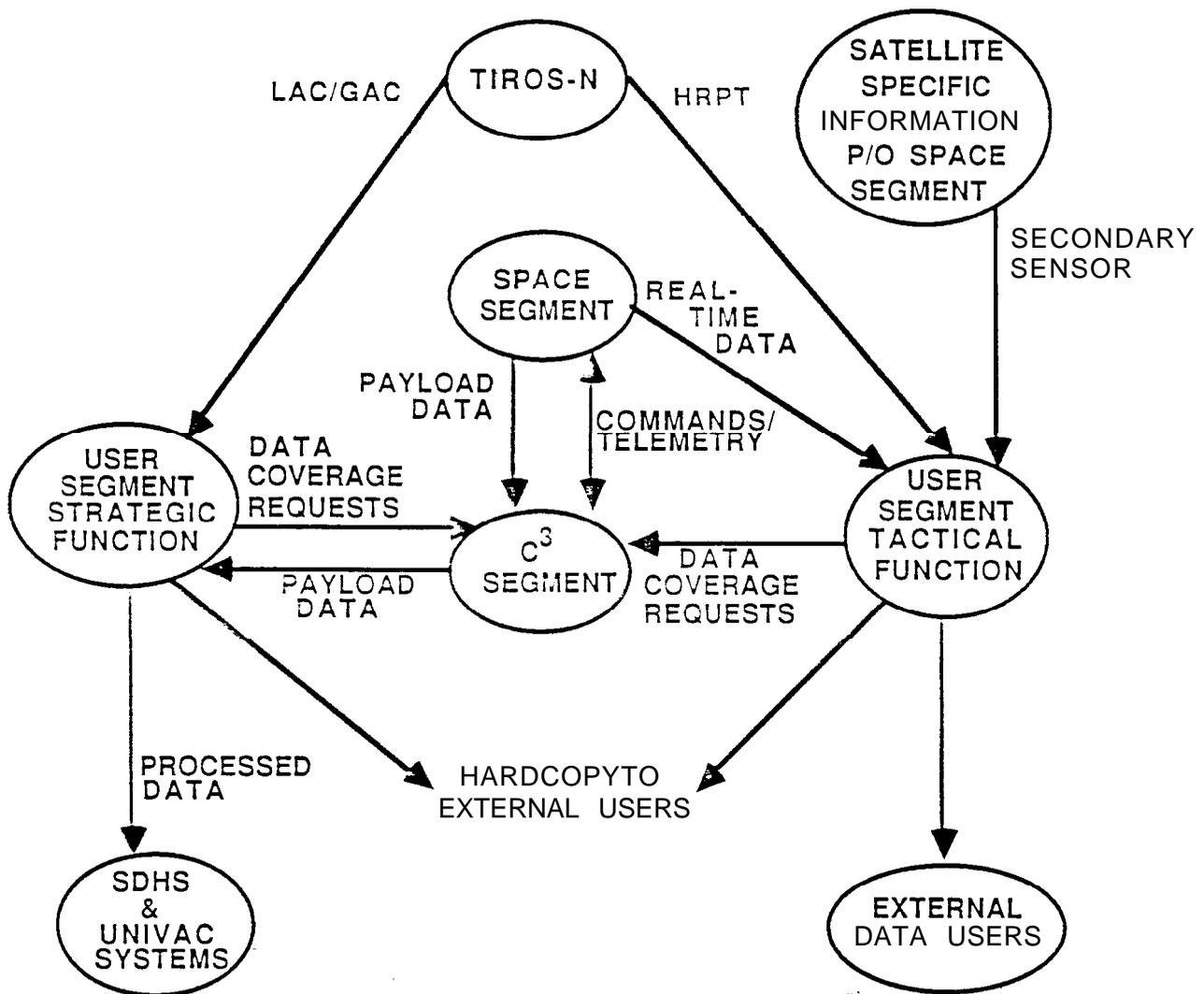


Figure 3.1.5-1 System Functional Relationships

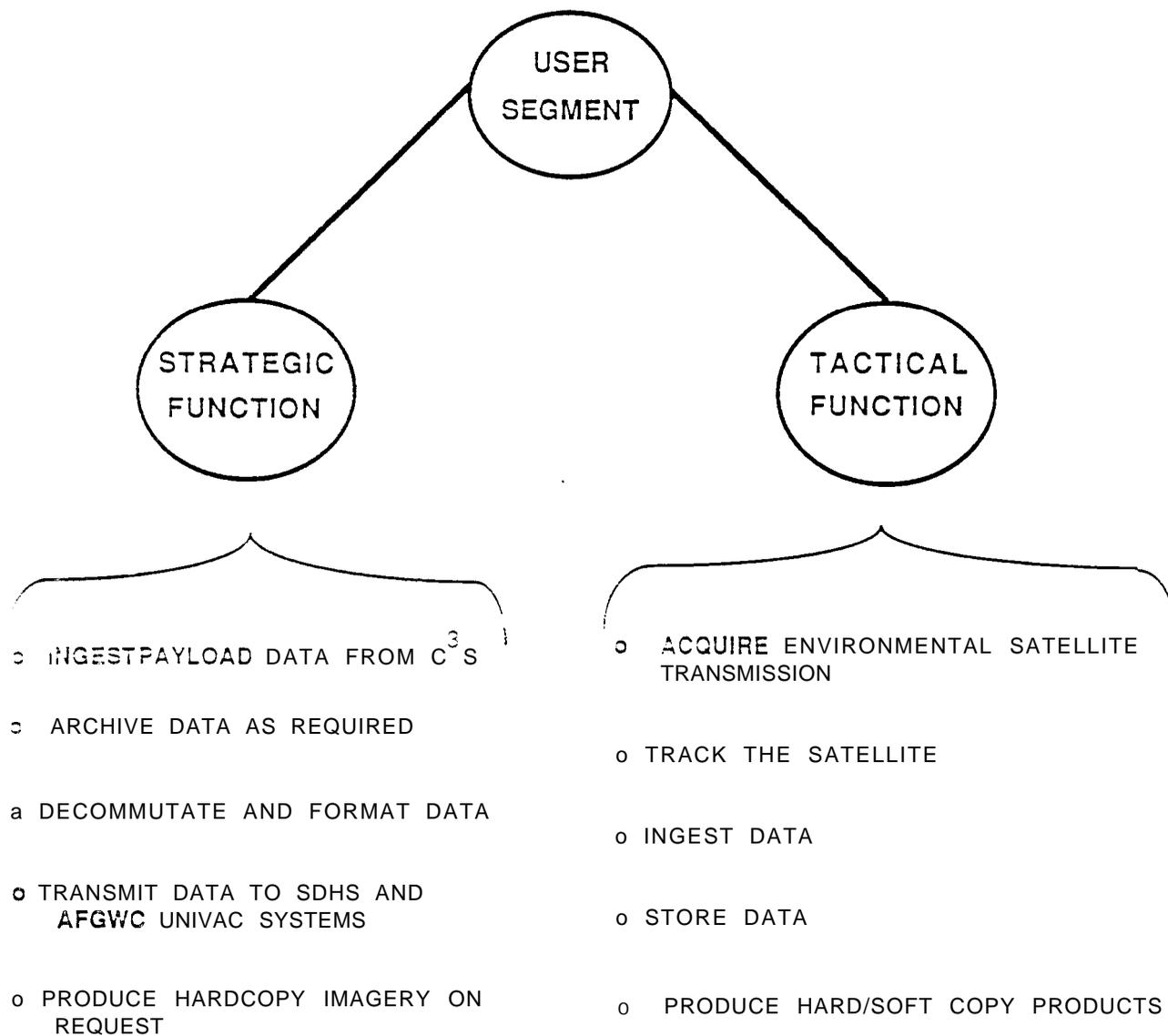


Figure 3.1.5.1-1 Segment allocation

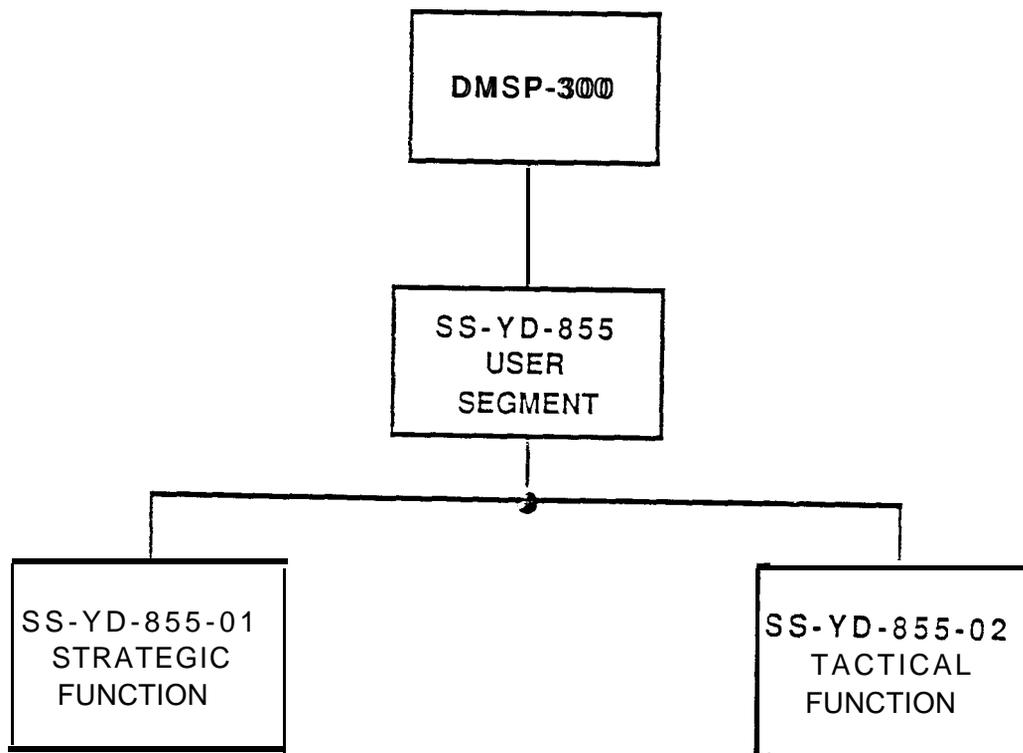


Figure 3.1.6-1 JS System Level Specification Tree

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3.1.7 Interface Requirements. The interface requirements for the US shall be as described in the following paragraphs.

3.1.7.1 External Interfaces. The US has three external interfaces. These interfaces are to the C3 Segment, Space Segment, and the Strategic Customer.

3.1.7.1.1 External Systems Description: The systems external to the US are as follows:

- a. DMSP Space Segment. The DMSP Space Segment consists of a constellation of polar orbiting satellites. These satellites provide environmental data coverage for the early morning and near-noon time periods. A complement of sensors provides visual and infrared imagery data, as well as specialized data such as electron precipitation.
- b. TIROS-N Space Segment. The TIROS-N Space Segment consists of a constellation of polar orbiting satellites operated by the National Oceanographic and Atmospheric Administration (NOAA). These satellites provide meteorological data coverage for the early morning and near-noon time periods.
- c. DMSP C3 Segment. The C3 Segment provides for command and control of the DMSP satellite. This command and control function provides for upload of the commands necessary to satisfy user data coverage requirements. It also provides the telemetry analysis and mission planning necessary to maintain the continued health of the satellite and data coverage required by DMS? data users. All communications links between

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the remote stations, used for the transmission of meteorological data and command/telemetry data, are a part of the C3 Segment.

- u. TIROS-N Ground Segment. The TIROS-N Ground Segment provides for the receipt of TIROS-N data at CDA, located at Gilmore Creek Alaska; and Wallops Island Virginia. The received data is then transmitted to data users via DOMSAT communications.
- e. Strategic Customer. The Strategic Customer consists of the AFGWC SDHS and UNISYS systems. These systems are used to provide weather analyses and to generate specialized weather forecasts. The products from the Strategic Customer are disseminated to DoD users worldwide.
- f. Tactical Customer. The Tactical Customer consist of users in the field and on selected ships. These users rely upon both CRT imagery and hardcopy products provided by the tactical systems.

3.1.7.i.2 External Interface Identification. US external interfaces are defined in the following documents:

- 1. IS-YD-853. Interface Specification between the Space Segment and Ground System of the DMSP
- b. IS-YD-861. Interface Specification C3 Segment to US
- c. IS-YD-862. Interface Specification US to Strategic Customer
- d. HGSG 142054. Interface Specification TIROS-N

The relationship of these interfaces is shown in Figure 3.1.7.1.2-1.

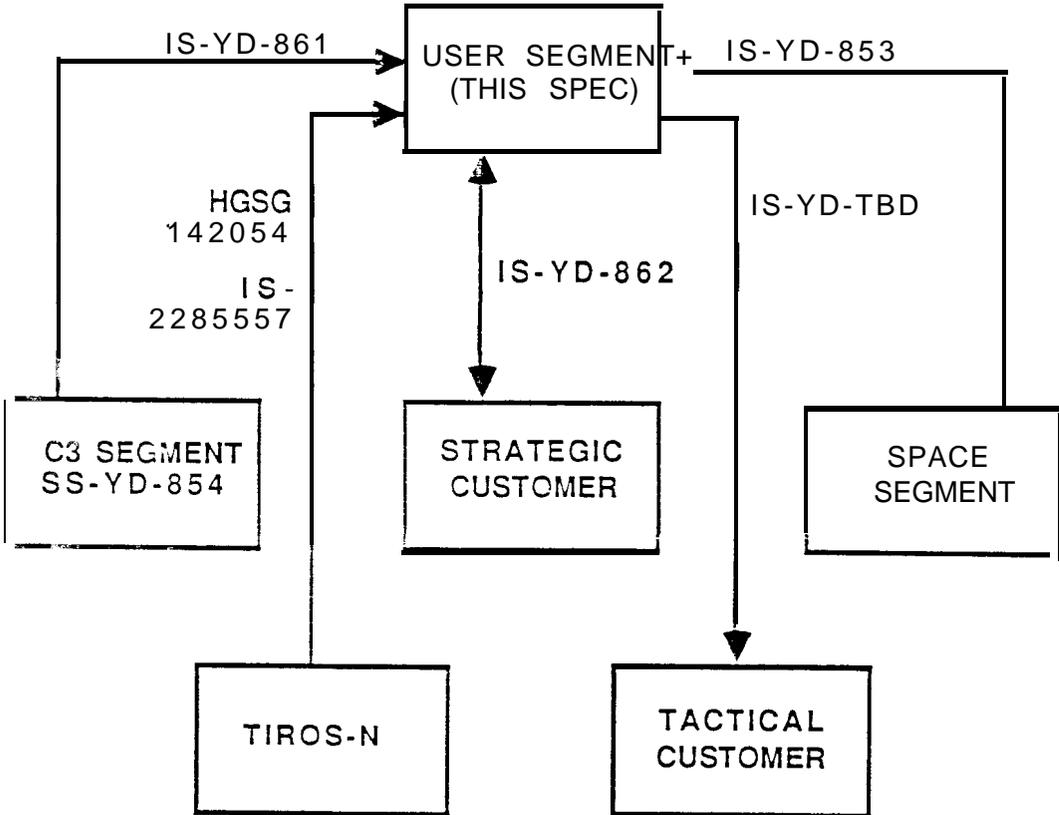


Figure 3.1.7.1.2-1 External Systems Interface Diagram

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3.1.7.1.3 Hardware-to-Hardware External Interfaces.

Hardware-to-Hardware interfaces for the US Strategic and Tactical Functions are contained in SS-YD-855-01 and SS-YD-855-02 respectively.

3.1.7.1.4 Hardware-to-Software External Interfaces.

Hardware-to-Software interfaces for the US Strategic and Tactical Functions are contained in SS-YD-855-01 and SS-YD-855-02 respectively.

3.1.7.1.5 Software-to-Software External Interfaces.

Software-to-Software interfaces for the US Strategic and Tactical Functions are contained in SS-YD-855-01 and SS-YD-855-02 respectively.

3.1.7.2 Internal Interfaces. The US internal interfaces shall be in accordance with the following paragraphs.

3.1.7.2.1 Internal Interfaces Identification.

Identification of each of the internal interfaces for the US Strategic and Tactical Functions is contained in SS-YD-855-01 and SS-YD-855-02 respectively. There are no direct interfaces between the Strategic and Tactical Functions.

3.1.7.2.2 HWCI-to-HWCI Interfaces. HWCI-to-HWCI interfaces for the US Strategic and Tactical Functions are contained in SS-YD-855-01 and SS-YD-855-02 respectively. There are no direct interfaces between the Strategic and Tactical Functions.

3.1.7.2.3 HWCI-to-CSCI Interfaces. HWCI-to-CSCI interfaces for the US Strategic and Tactical Functions are contained in SS-YD-855-01 and SS-YD-855-02 respectively. There are no direct interfaces between the Strategic and Tactical Functions.

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3.1.7.2.4 CSCI-to-CSCI Interfaces. CSCI-to-CSCI interfaces for the US Strategic and Tactical Functions are contained in SS-"D-255-01 and SS-YD-855-02 respectively. There are no direct interfaces between the Strategic and Tactical Functions.

3.1.8 Government Furnished Property List. This section is not applicable to this specification.

3.2 system Characteristics. This section establishes the characteristics for the US. Detailed requirements for the Strategic and Tactical Functions are covered in SS-YD-855-01 and SS-"D-855-02 respectively.

3.2.1 Physical Requirements. This section establishes the physical characteristics for the US.

- a. Weight Limits. The weight of the individual chassis of equipment shall be held to a minimum consistent with electrical function and human factors. For custom-designed and fabricated equipment, handles, bails, or other lifting devices, shall be provided for convenient handling by two persons when unit weight exceeds 40 pounds. Additional weight constraints for the Tactical Function are specified in SS-YD-855-02.
- b. Dimensional and Volume Limitations. No specific limits exist for the entire US because of the distributed nature of the segment. Specific requirements for the Strategic and Tactical Functions are contained within SS-YD-855-01 and SS-YD-855-02 respectively.

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- c. **Transport and Storage Requirements.** Individual chassis and racks within the US shall be transportable via normal commercial and military transportation systems. Chassis will be removed from racks prior to shipment of the racks. Each component shall be individually packaged in accordance with MIL-P-9024G.

Reusable or specially designed containers shall be screened in accordance* with MIL-STD-1510A prior to container design or use. All containers shall be marked in accordance with MIL-STD-129J and special provisions of the contract.

Transportable terminals shall be designed for air transport. Further, they shall be capable of being towed to/from their operating location in accordance with SS-YD-855-02.

- d. **Durability.** Components located within the Strategic Function of the US shall be designed for use within a commercial computer room environment. Once installed, equipment shall not be moved except for maintenance purposes. Special requirements for the Tactical Function are specified in SS-YD-855-02.

- e. **Health and Safety.** Ventilation or other protective measures shall be provided to keep gases, vapors, dust, and fumes below the levels allowed by MIL-STD-1472C-. Use of toxic or caustic substances shall, where possible, be avoided for any processes conducted within the US. Where toxic or caustic substances are used, measures shall be taken to prevent inadvertent exposure of personnel to either the substance or fumes from the substance. Shielding shall be provided for equipment using lasers to prevent injury to personnel either during operation or maintenance.

- f. **Security Criteria.** The US shall provide physical security for cryptographic devices. Methods to be employed shall be secured rooms, rack enclosures with lockable doors, locking devices for the cryptographic equipment, or safes for cryptographic items removed from the rack.
- g. **Vulnerability Factors.** Vulnerability factors are not applicable with the exception of fire. The US shall make use of fire extinguisher systems integral to fixed facilities and portable fire extinguishers for transportable terminals. Portable extinguishers may be used to supplement integral fire extinguisher systems.
- h. **-Command and Control Requirements.** The US shall not require use of external command and control systems for operation of functions within the US. Control consoles and panels shall be co-located with the functions they control.

3.2.2 Environmental Conditions. Equipment designed and built for the US shall operate within specification limits during and after exposure to the environments given below. Environmental requirements shall be based upon analysis of components rating/derating and shall not take safety margins into account. Commercial equipment selection shall take the environmental requirements of this specification into account.

- a. **Natural Environment.** Refer to SS-YD-855-01 for Strategic Function requirements and SS-YD-855-02 for Tactical Function requirements.
- b. **Induced Environment.** Refer to SS-YD-855-01 for Strategic Function requirements and SS-YD-855-02 for Tactical Function requirements.

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- c. Electromagnetic Signal Environment. Refer to SS-YD-855-01 for Strategic Function requirements and SS-YD-855-02 for Tactical Function requirements.
- d. Shioboard Magnetic Environment. This section is not applicable to this specification.
- e. Environments due to enemy action. This section is not applicable to this specification.

3.2.3 Nuclear Control Requirements. This section is not applicable to this specification.

3.2.4 Materials, Processes and Parts. Materials processes and parts used within the US shall meet the following criteria:

- a. Selection of material, processes and parts shall be consistent with the requirement for producing a system that is not necessarily completely MIL-Spec, but rather a system economically produced and capable of performing its specified functions with ruggedness and durability. This requirement shall be satisfied by the selection of industrially proven low cost materials, processes and parts that do not degrade the quality of the US.
- b. MIL-E-4158E shall be used as a guide for selection of materials, processes and parts utilized in the design of new US equipment parts.

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- c. The materials chosen shall be of low toxicity, not having dangerous classes due to fire or other toxic effects when used in a normal manner.
- d. The materials chosen shall be non-nutrient to fungus and insects, flame resistant, non-hygroscopic, and not adversely affected by the environmental conditions specified hereinbefore.
- e. The parts and other materials used in the US shall be available in the United States of America.

3.2.5 Electromagnetic Radiation. The US shall be designed to minimize electromagnetic interference propagation and to minimize susceptibility to interference from other sources. Electrical and electronic equipment shall operate satisfactorily, not only independently, but also in conjunction with other equipment which may be located nearby. New equipment designed for the US shall meet the provisions of MIL-STD-1542 and MIL-STD-461B.

3.2.6 Workmanship. The US equipment, including all parts and accessories, shall be constructed in compliance with MIL-STD-454K, Requirement 9.

3.2.7 Interchangeability. All components, assemblies, subassemblies, and modules that are identical with respect to fit, form, and function shall be interchangeable.

3.2.8 Safety. The design of all elements of the US shall provide protection against personal injury and equipment damage. System safety engineering principles shall be in accordance with MIL-E-4158E, paragraph entitled "Safety of Personnel". Bonding and grounding shall be in accordance with MIL-STD-1542.

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3.2.9 Human Performance/Human Engineering. Human engineering criteria, as defined in MIL-STD-1472C, shall be applied as guidelines to the design and layout of the US equipment. User displays shall avoid unnecessary clutter to enhance usability. Consideration shall be given to the use of graphic representations, called ICONS, in place of textual presentation of system options. Data entry procedures shall minimize the number of keystrokes necessary to initiate system actions. Where possible, pointing devices such as light pens, touch screen, or mouse shall be considered for use in place of a keyboard. System facilities shall include help functions and error checking for operator entries.

3.2.10 Deployment Requirements. No deployment requirements exist for the Strategic Function of the US. Deployment requirements for the Tactical Function are specified in SS-YD-855-02.

3.2.11 System Reliability Models. System reliability models shall be based upon MIL-STD-756B.

3.2.12 Nameplates and Product Marking. Nameplates and product markings shall be in accordance with MIL-STD-130F. A rack numbering system as outlined in ANSI Y32.16a-1970 shall be used to identify all racks, chassis, and subassemblies down to and including item and component parts. The numbers shall be permanently affixed adjacent to the individual assemblies. Nameplates shall include the manufacturer's name and contract number and shall be located in a conspicuous place, preferably on the back or back panel of the item. The plates shall not interfere with controls or obscure other information.

3.2.13 Performance Characteristics. Performance characteristics for the US shall be as follows:

3.2.13.1 Life Cycle. The useful life cycle of the US shall be a minimum of 10 years when operated and maintained in accordance with delivered maintenance documentation.

3.2.13.2 Induced Errors. Total errors induced by the contractor provided US equipment shall not exceed one bit error in 10⁷ bits for any one processing string within the local facility (e.g., Site III or Tactical Terminal),

3.2.13.3 Strategic Function. Specific performance characteristics for the Strategic Function are contained in SS-YD-855-01.

3.2.13.4 Tactical Function. Specific performance characteristics for the Tactical Function are contained in SS-YD-835-02.

3.3 Processing Resources. The processing resources for the US Strategic Function and Tactical Function are specified in SS-YD-855-01 and SS-YD-855-02 respectively.

3.4 Quality Factors. Quality factors for the US shall be as specified in the following paragraphs.

3.4.1 Reliability. The reliability factors for the Strategic and Tactical functions are different due to the nature of their missions. Individual requirements for these two functions are contained in SS-YD-855-01 and SS-YD-855-02 respectively. The general reliability requirements for each of the functions shall be in accordance with DMSP-300 3.2.3 (as it applies to ground systems), 3.2.3.3, 3.2.3.4, and 3.2.3.5 (as it applies to ground systems) of DMSP-300.

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3.4.2 Modifiability. The US shall conform to the following requirements.

3.4.2.1 Maintainability. The maintainability factors for the Strategic and Tactical functions are different due to the nature of their missions. Specific requirements for these two functions are contained in SS-YD-855-C: and SS-YD-855-02 respectively. Each of the US functions shall meet the maintainability requirements of 3.2.4 and 3.2.4.1 of DMSP-300. Maintainability standards shall be determined in accordance with MIL-STD-1472C.

3.4.2.2 Flexibility and Expansion. The US shall, where practical, incorporate designs which allow for variations in operation without system redesign. For example, the system may allow the flexibility to establish signal routing to equipment items via either computer control or manual operation. US expansion within either of the major functions shall be limited by applicable floor space, rack space, power, and conditioning, and weight constraints.

3.4.3 Availability. The availability of the US shall not be less than 0.96. This availability factor is based upon availability of hardware recommended as part of a provisioning conference, and trained maintenance personnel able to provide immediate response-to maintenance calls,

3.4.4 Portability. The US shall provide for limited portability of hardware and software. Individual subsystems/ components shall be of rack mount design. Portability of chassis between locations shall be accomplished by padded cart or hand carrying in the local area and by packing and shipping for long distance movement. Transportable terminals shall provide portability

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as a single integrated unit. These units shall be towable on the ground, as well as of a size and weight compatible with air transport.

Software portability shall be limited to using the software on systems using the same or compatible model of computer as long as the computer is equipped with compatible peripheral devices. Source code shall be portable to the extent that only those changes necessary to accommodate changes in hardware or operating systems environments are required.

3.4.5 Additional Quality Factors. This section is not applicable to This specification.

3.5 Logistics. Equipment designs shall be based upon minimizing the system life cycle cost over a life cycle of 10 years. Emphasis shall be placed on the remove/repair/replace concept to minimize support requirements.

3.5.1 Support Concept. The support concept for the US shall be as follows:

3.5.1.1 Multipurpose Test Equipment. Equipment used within the US shall be designed to be maintained using general purpose test equipment such as multimeters, oscilloscopes, and digital analyzers. Built-in test equipment (SITE) and built-in test (BIT) features shall be used where practical to isolate problems to an individual component board. These BIT/BITE facilities may also provide features which aid the technician in the effective use of multipurpose test equipment for isolating problems on an individual circuit board or within the chassis electronics of a large/complex item of equipment.

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3.5.1.2 Repair versus Replacement Criteria. Where or-a critical, remove-and-reolace maintenance and repair actions shall apply to all ground system elements. Repaired components shall meet the performance and reliability requirements established for acceptance of original fabricated articles.

3.5.1.3 Organizational Levels of Maintenance. The levels of maintenance and their associated functions within the US shall be as follows.

- a. Organizational Maintenance. Organizational level maintenance shall provide for fault isolation to the Line Replaceable Unit (LRU) using built-in self-test and fault isolation capabilities when available. An LRU is defined herein as the smallest unit that can be removed and replaced without cutting or desoldering connections. On-equipment malfunctions shall be traced to the LRU level using a combination of BIT/BITE and multipurpose test equipment.

Necessary alignment of equipment after removal and replacement of failed assemblies shall be easily performed using available BIT/BITE and multipurpose test equipment. All adjustments shall be accessible *without removal of the item from the rack. Extension of the item from the rack using slides or rails is an acceptable method for gaining access to adjustments.

- b. Intermediate Maintenance. Intermediate maintenance shall provide for fault isolation and repair of units and subassemblies removed from the operational system. This level of maintenance will support organizational level maintenance if the complexity of the problem warrants. Repair actions shall be limited to replacement of plug-in integrated circuits and

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mechanical/electromechanical components as required. Multi-layer printed circuit boards with soldered components shall not be maintained at this level of maintenance.

- c. Depot Maintenance. Depot maintenance shall encompass those maintenance activities which are beyond the capabilities of organizational and intermediate maintenance. Vendor facilities may be designated as the depot for items which require special tooling/equipment or skills.

3.5.1.4 Maintenance and Repair Cycles. The US shall not require periodic repair or replacement of electronic components. Periodic maintenance shall consist of the cleaning/replacement of filter screens and general cleaning of the equipment.

3.5.1.5 Accessibility. US chassis designed for the US shall provide full access to all test points and adjustments. Use of slides or rails to extend a unit from the host rack is acceptable for gaining access to adjustments. Newly designed equipment shall meet the requirements of MIL-STD-454K. These requirements shall be used as a guide in the selection of commercial off-the-shelf components.

3.5.1.6 Other Requirements. No other DMS? US support requirements apply to this specification. Refer to SS-YD-855-01 and SS-YD-855-02 for additional requirements for the Strategic and Tactical Functions.

3.5.2 Support Facilities. The support facilities for the US shall be as follows.

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3.5.2.1 Hardware Support. Hardware support for the US Strategic Function shall be provided by a maintenance contractor with additional support from equipment vendors as required. Tactical Function hardware support shall be provided by SM-ALC with support from vendors as required.

3.5.2.2 CSCI Support. CSCI support shall be accomplished using either off-line computer equipment or redundant on-line computer resources. No CSCI software maintenance shall be accomplished at tactical sites with the exception of loading new programs provided by the depot; Contractor/vendor computer facilities may be used for CSCI maintenance when the purchase and maintenance of a test facility is not cost effective.

Specific CSCI support facility requirements are contained in SS-YD-855-31 and SS-YD-855-02.

3.5.3 Supply. Design of the US shall comply with the following requirements, 

- a. Introduction of new items into the supply system shall be minimized. New items not supported by the supply system shall only be used when the existing items contain obsolete parts that are not available, or are no longer in production. New items shall also be used when the performance of existing items will not meet the requirements of this specification.

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- b. **Resupply Methods.** The most base supply system shall be used for supply of the Strategic Function and those tactical terminals that are located on or near a military installation. Contractor or vendor support may be used in those instances where parts are not stocked within the military supply system. Use of contractor/vendor support shall be at the discretion of the depot, operating agency, and operating command:
- c. **Distribution and location of system stocks.** System spares shall be located at each operating location. The stocking of piece parts shall be minimized.
- d. **Other Requirements.** To minimize the impact on Air Force Depot Supply support, use of the same plug-in board/sub-chassis in more than one application shall be maximized.

3.5.4 Personnel. Minimum personnel requirements for the US shall be as follows:

- a. **Skill level.** The US shall be designed for operation by personnel possessing a 5 skill level at Strategic Sites and 7 skill level at Tactical Sites.
- b. **Manning Requirements.** The US shall be designed to be operated by one individual at each operating location. For safety reasons and relief of duties, a second person should be assigned to each shift. This manning level does not include maintenance personnel, personnel used for manual dissemination of weather products, supervisory personnel, or administrative personnel.

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c. **Manning requirements during deployment.** The Strategic Function has no deployment requirement. The Tactical Function shall provide for reconfiguration from transportable mode to operational mode within the times specified below using the numbers of personnel listed:

- 1) Preferred: four persons in six hours
- 2) Acceptable: six persons in eight hours

3.5.5 Training. The training concept utilized for the US will be initial contractor Type I Training for Users and Maintainer/Operators. All follow-on initial training for Maintainer/Operators and Meteorological Satellite (METSAT) Coordinators will be developed by Headquarters Air Training Command (HQ-ATC). Air Training Command (ATC) instructors will attend the Type I courses and use the materials developed by the contractor to develop the ATC courses. ATC training will be conducted on either simulators or operational equipment. Other operational training not provided by ATC will be provided at the operational units by On-the-Job-Training (OJT). OJT will be conducted with hands-on teaching and programmed learning modules.

3.6 Precedence. The specification precedence for the US shall be as follows:

- a. . DMSP-300
- b. DMSP System Interface Specifications
- c. SS-YD-855
- d. SS-YD-855-01 and SS-YD-855-02 (equal)
- e. Military Standards
- f. Military Specifications

NOTE: Compliance documents may vary between SS-YD-855, SS-YD-855-01, and SS-YD-855-02 due to the document or document revision in effect when the system element in question is designed and constructed.

3.7 Documentation. Documentation shall be as stated in 3.4 of DMSP-300.

4. QUALIFICATION REQUIREMENTS

4.1 General. Tests and evaluations shall verify that the design and performance of the US meets or exceeds the requirements specified in Section 3 of this specification.

4.1.1 Philosophy of Testing. Preparation for US tests shall begin during the initial design phase. Significant design features which support the higher level requirements of this specification shall be documented and included in the test planning process. Tests shall be conducted at three levels as described in 4.1.5.

Tests shall be developed to demonstrate the operational suitability of the HWCI, CSCI, or system as well as its ability to meet the requirements of this specification. Operational scenarios shall be developed to demonstrate system operation under normal operations and under stressed conditions. Examples of stressed conditions are rapid turnaround and requirements for large quantities of data over that normally required.

4.1.2 Location of Testing. US tests shall take place in the following locations:

- a. Development testing. - Contractor facility.
- b. Preliminary Qualification Testing (PQT) - Contractor facility.
- c. Formal Qualification Testing (FQT) - Contractor facility or final system location.
- d. Acceptance testing.
 - 1) Transportable equipment - contractor facility or government proving ground.
 - 2) Fixed place systems - final operating location.

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4.1.3 Responsibility for Tests. The contractor is responsible for all inspection, analysis and testing performed by subcontractors and suppliers of hardware/software for the US. The contractor is also responsible for conducting of development tests, PQT, FQT, and acceptance testing. The government shall observe all PTQ, FQT, and acceptance resting.

4.1.4 Qualification Methods. HWCI, CSCI, and system level testing shall use the following verification methods.

- a. Inspection is a method of verification of the physical characteristics without the use of special laboratory equipment, procedures, items, and services.
- b. Analysis is a method of verification involving study, calculation and modeling.
- c. Test is a method of verification denoting the qualitative and quantitative determination of the properties and parameters of items, or components thereof, by means requiring the use of laboratory equipment, procedures, items or services.
- d. Demonstration is a method of verification denoting the qualitative determination of the properties and parameters of items, or components thereof, by means which do not necessarily require the use of laboratory equipment, procedures, items or services.

4.1.5 Test Levels. Tests shall be conducted at three levels as follows:

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- a. **Development Testing.** The testing performed at this level shall be accomplished by the development team to ensure that individual hardware/software modules function correctly. This testing shall also include preliminary tests of entire hardware items/computer programs and/or complete subsystems within the us.
- b. **Qualification Testing.** The testing performed at this level shall be accomplished by test engineers in conjunction with the development engineers. These tests shall encompass the entire system/subsystem including all HWCIs and CSCIs. There shall be two levels of qualification testing. These levels are PQT and FQT.

PQT shall be performed to ensure that all specification requirements have been met. Discrepancies from this test shall be corrected prior to proceeding to FQT. FQT shall also serve to ensure that the specification requirements have been met. It shall also verify that discrepancies discovered during PQT have been corrected and that the system functionally performs as required for actual operations.

- c. **Acceptance Testing.** Acceptance testing shall be performed upon completion of the installation at the government site or upon completion of assembly for transportable systems. This test shall ensure that the system performs according to specification in an operational environment. All discrepancies shall be cleared prior to acceptance of the HWCI, CSCI, or system.

4.1.6 Special Tests and Examinations, This section is not applicable to this specification.

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4.2 Formal Tests. Changes to the US shall be formally tested during all phases of design, fabrication, integration and installation. The following requirements apply:

- a. Engineering evaluation and test shall be performed on all hardware/software items obtained from other vendors. This evaluation and test shall also apply to items of government furnished equipment critical to the performance of the US. Individual HWCI or CSCI components developed specifically for incorporation in the US shall be tested and evaluated prior to installation/integration into the next higher level assembly.
- b. Items which cannot be tested until they are integrated into the operational system shall be tested at the earliest possible time during PQT, FQT, or acceptance testing.
- c. Environmental testing shall only be required for equipment items intended for operation within harsh environments. An example would be environmental testing of a complete transportable terminal.
- d. Reliability information obtained during development, development testing and each level of qualification testing shall be maintained and used for analysis of system reliability.
- e. The contractor shall verify the proper on-site installation of hardware and software prior to start of performance testing. This testing is intended to eliminate problems caused by disconnected cables or incorrect software revision levels. System documentation shall be used in performing this system verification to ensure that the system configuration and documentation are both correct.

4.3 Formal Test Constraints. This section is not applicable to this specification.

4.4 Qualification Cross Reference. The Verification method for each item in Section 3 shall be as specified in Table I.

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TABLE I - VERIFICATION CROSS REFERENCE MATRIX

Paragraph	Qualification				Method	Qualification Level			
	N	I	A	T		D	1	2	3
3.	N								
3.1	N								
3.1.1					D			3	
3.1.2			4					3	
3.1.3					D			3	
3.1.4	N								
3.1.4.1					D			3	
3.1.4.2					D			3	
3.1.5			A					3	
3.1.5.1			A					3	
3.1.6			A			1			
3.1.7	N								
3.1.7.1					D			3	
3.1.7.1.1	N								
3.1.7.1.2		I						3	
3.1.7.1.3					D		2		
3.1.7.1.4					D		2		
3.1.7.1.5					D		2		
3.1.7.2	N								
3.1.7.2.1		I						3	
3.1.7.2.2		I					2		

Qualification Method

I - Inspection

A - Analysis

T - Test

D - Demonstration

N - Not Applicable

Qualification Level

1 - Configuration Item

2 - System Integration

3 - System

4 - System Installation

TABLE I - VERIFICATION CROSS REFERENCE MATRIX

Paragraph	Qualification				Method	Qualification Level		
	N	I	A	T		D	12	3
3.3					D		3	
3.4	N							
3.4.i			A			1	3	
3.4.2	N							
3.4.2.1			A			1	3	
3.4.2.2			A			1	3	
3.4.3			A			1	3	
3.4.4						1	3	
3.4.5	N							
3.5			A			1	3	
3.5.1	N							
3.5.1.1			A				3	
3.5.1.2			A				3	
3.5.1.3			A			1	3	
3.5.1.4		I	A			1	3	
3.5.1.5		I				1		
3.5.1.6	N							
3.5.2	N							
3.5.2.1	N							
3.5.2.2	N							
3.5.3		I	A			1	3	

Qualification Method

I - Inspection

A - Analysis

T - Test

D - Demonstration

N - Not Applicable

Qualification Level

1 - Configuration Item

2 - System Integration

3 - System

4 - System Installation

TABLE I - VERIFICATION CROSS REFERENCE MATRIX

Paragraph	Qual i f i c a t i o n					Method	Qual i f i c a t i o n				Level
	N	I	A	T	D		1	2	3	4	
3.5.4			A					1		3	
3.5.5		I						1		3	
3.6			A							3	
3.7		I						1		3	

Qual i f i c a t i o n Method

I - Inspection

A - Analysis

T - Test

D - Demonstration

N - Not Applicable

Qual i f i c a t i o n Level

1 - Configuration Item

2 - System Integration

3 - System

4 - System Installation

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5. PREPARATION FOR DELIVERY

5.1 Packaging. Preservation, packaging and packing shall be developed in accordance with MIL-P-9024G and as further defined in the contract schedule.

5.2 Special Design Containers. Reusable or specially designed containers shall be screened using MIL-STD-1510A prior to container design.

5.3 Container Marking. Marking shall be in accordance with MIL-STD-129J and the special provisions of the contract.

6. NOTES

6.1 Acronym List.AcronymDefinition

AFB	Air Force Base
AFGWC	Air Force Global Weather Central
ALCOIL	All Combined Operator's Information Listing
ATC	Air Training Command
BIT	Built-In Test
BITE	Built-In Test Equipment
c3	Command, Control & Communications
CDAS	Command Data Acquisition Stations
CRT	Cathode Ray Tube
CSCI	Computer Software Configuration Items
DMSP	Defense Meteorological Satellite Program
DoD	Department of Defense

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DOMSAT Domestic Communications Satellite
EMC Electromagnetic Compatibility
FNOC Fleet Numerical Oceanography Center
FQT Formal Qualification Testing
HQ-ATC Headquarters Air Training Command
HWCI -Hardware Configuration Items
LRU Line Replaceable Unit
METSAT Meteorological Satellite
NOAA National Oceanographic and Atmospheric Administration
OJT On-the-Job-Training
PQT Preliminary Qualification Testing
RTD Real-Time Data
SDHS Satellite Data Handling System
SGS Strategic Ground Segment
TIROS-N Television Infrared Observation Satellite Series N
us User Segment