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INTERNATIONAL SPACE STATION ORBITAL VOL-I

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INTERNATIONAL SPACE STATION ORBITAL VOL-I  
PROGRAM REQUIREMENTS DOCUMENT/PROGRAM SUPPORT PLAN/  
OPERATIONS REQUIREMENT/OPERATIONS DIRECTIVE (PRD/PSP/OR/OD)  
PROGRAM NUMBER: 30000

SECTION 1031 - INDEX

PUBLICATION DATE: 05/31/96      REVISION: 0000      RUN DATE: 04/29/10

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SECTION 1100 - PROGRAM DESCRIPTION

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[PRD] DATABASE RECORD:      534319      REQUIREMENT STATUS: APPROVED
DOCUMENT ID:                ISS VOL-I   APPROVAL DATE:         04/29/10
                                           INITIAL DATE:         08/23/96
ITEM NUMBER:                T1DEGHKX  DATE LAST CHANGED:    04/29/10
SECTION:                    1100       TIME LAST CHANGED:    09:28:29

REQUESTER:                  JSC
TEST CODE:                  INFO
    
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1. DESCRIPTION:      OPERATIONAL CONCEPTS - GENERAL

The ISS on-orbit activities are supported by an operations and utilization framework which is designed to ensure manageable and safe operations that promote the basic goal of productive and flexible utilization by the ISS user community. The crew, ground controllers, ground maintenance personnel, and ground processing personnel perform the functions needed to operate and sustain the orbiting facility. A community of scientists, engineers, and commercial entities participate in and benefit from the Program by using its unique capabilities to promote scientific discovery and to develop new technologies.

The ISS is operated by the crew, onboard automation, and ground controllers. The ISS has a 24-hour autonomous capability to protect critical systems, vehicle integrity, and crew survival. The crew will have sufficient data and command capability to control subsystem operations and payload operations in order to continue human-tended utilization and vehicle operations during loss of communication with the ground facilities, or to respond to vehicle failures and contingencies. Crew tasks include support for payload operations, visiting vehicle operations, extravehicular activity (EVA), robotics, and onboard maintenance.

A team of personnel located on the ground assists the ISS in its real-time operation by planning, monitoring, and controlling ISS activities. In parallel with real-time activities, ground teams process reusable logistics modules, prepare visiting vehicle with necessary logistics, integrate the next set of payloads, and plan and conduct training for the next several increments.

OPERATIONS

The ISS on-orbit operations consists of the spacecraft system related activities will be performed by the ISS ground operations

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[PRD] DATABASE RECORD: 534319  
ITEM NUMBER: T1DEGHKX

support at NASA field centers and the International Partners (IP) facilities. Efficient communication among ground facilities is vital to mission success. The program will require operational and administrative links as appropriate for facilities and functions including those outlined below:

Spacecraft systems support and mission planning and integration related activities will be performed by the ISS ground operations support at NASA field centers and the International Partners (IP) facilities. Efficient communication among ground facilities is vital to mission success. The Program will require operational and administrative links as appropriate for facilities and functions including those outlined below:

- o Space Station Control Center (SSCC): The SSCC is the ISS portion of the Mission Control Center - Houston (MCC-H) located at the Johnson Space Center (JSC). It will be host to the Mission Management Team (MMT) and the overall ISS Flight Director, and it will provide functionally for overall planning and command and control of vehicle operations and flight safety, integrated across all IP elements. The SSCC will also function as the facility for the U.S. Flight Control Team to perform more detailed command and control of the U.S. elements, including planning, maintenance, etc. The SSCC will require communications services to support these operations responsibilities. Real-time systems operations data will flow between the SSCC and the ISS. Vehicle systems data, planning data, voice, and video will flow between JSC and various U.S. and IP ground facilities.
- o Mission Control Center - Moscow (MCC-M): The MCC-M, at Korolev, Russia, under the oversight of the MMT and in coordination with the SSCC, is responsible for the launch, rendezvous, docking, and on orbit operations of Russian elements and vehicles. The MCC-M is responsible for control of selected core systems functions else where in the ISS. These functions will primarily use the Russian communications and tracking (C&T) resources, but may also be performed via the interface to the SSCC and it's Space-to-Ground communications systems. Interfaces are required between the SSCC and the MCC-M for data and voice.

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- o Huntsville Operations Support Center (HOSC) - The HOSC, located at Marshall Space Flight Center (MSFC), provides the operational environment for all MSFC-supported space programs. It incorporates all systems required to perform data acquisition and distribution, telemetry processing, command services, database services, mission support services, and system monitoring and control. The Payload Operations Integration Center (POIC), located in the HOSC, will require communications services to support all utilization flights and all other increments supporting payload installation and operations during assembly phase. The POIC will exchange real-time data with geographically distributed user facilities in the U.S. and at IP locations. Payload commands and other data will be routed from the user operations facilities to the POIC for integration into the forward link command stream at the SSCC. The Payload Data Services System (PDSS), located in the HOSC, will be responsible for payload data processing and distribution. The PDSS will require communications services to receive ISS telemetry data and distribute payload data to user facilities in the U.S. and at IP locations. Communications requirements contained in this document for the POIC, PDSS, Remote Area for Payload Support (RAPS), and other MSFC operational facilities are routed through the HOSC.
  
- o Backup Control Center-HOSC (BCC-HOSC): The BCC-HOSC, located in Huntsville, Alabama, is a Backup Control Center facility to the Mission Control Center (MCC), located in Houston, Texas. The BCC-HOSC is a warm backup facility, capable of providing basic MCC services to the ISS at a full 24 hour period 365 days a year. The full BCC-HOSC capabilities may be activated in the event that MCC is unavailable due to natural or human-caused disasters. The BCC-HOSC will provide Flight Control services for up to 10 JSC Flight Controllers. The BCC-HOSC is optimized to provide basic Flight Control services for up to 30 days. In the event that the BCC-HOSC is activated, initial use of the facility will be by way of FIPS 140-2 Level 2 secured Mobile Computing System (MCS) laptop, from locations physically remote from the BCC-HOSC, such as Austin, Texas. In the event that an MCC outage is expected to be severe or otherwise span several days or weeks, select JSC Flight Control personnel will physically travel to and staff the BCC-HOSC in

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Huntsville.

- o Telescience Support Center (TSC): The TSC is a NASA funded facility which provides the capability to plan and operate on-orbit facility class payloads and experiments, other payloads and experiments, and instruments.
- o International Partners (IP) Facilities: The IP facilities are responsible for the coordinated command and control of IP systems and payloads. Data relating to IP ISS systems and experiments will be transferred to and from the Italian Space Agency (ASI), CSA, ESA, and JAXA. The IP's will provide communications services from designated termination point to their facilities. (NOTE: Due to contractual agreements, the Japanese's Gateway is still officially known as the National Space Development Agency of Japan (NASDA Gateway).
- o Training Facilities: Training facilities, including the Space Station Training Facility (SSTF) and the Payload Training Facility (PTF) at JSC, will provide ISS core systems and payload systems training for Program crews, ground support personnel, and users. This will require communications services to transfer Instructor Station data and simulated Space Station data, voice, and video.
- o Automated Transfer Vehicle (ATV) Control Center (ATVCC): The ATV-CC, hosted by the Centre National d'Etudes Spatiales (CNES) in Toulouse, France, on behalf of the European Space Agency (ESA), contains the monitoring and control systems for operating the ATV from Launch to docking, during attached phases and from de-docking to destructive re-entry. For communications, the ATV spacecraft relies on both the TDRS System and ARTEMIS (Advanced Relay and Technology Mission Satellite). The ATV operations are agreed upon and described in "ATV Flight Planning Ground Rules & Constraints". The interface between the ATV-CC and SSCC are agreed upon and described in the SSCC to ESA GS ICD Part I and II (SSP 450011).
- o H-II Transfer Vehicle (HTV) Control Center (HTVCC): The JAXA H-II Transfer Vehicle (HTV) Control Center (HTCC) will be located in the Space Station Integration and Promotion Center (SSIPC) in Tsukuba

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Space Center, Japan. The HTVCC will monitor and control the HTV from launch to ISS berthing, during attached phases of operations and from unberthing to destructive re-entry. During all phases of operation, the HTVCC will control the HTV spacecraft while under the authority of SSCC during critical approach, berthing, attached, and unberthing phases. The main functions of the HTVCC are flight planning, flight control, training and test, and interfaces to the external operational organizations. HTVCC flight planning will include trajectory planning, and flight evaluation for mission analysis. Re-planning will also occur in the HTVCC for contingencies during real-time operations. HTVCC Flight Control includes telemetry processing and command generation. The Flight Control function will supply functions to assist "GO/NO GO" judgment of the operator such as calculation of error ellipsoid to judge possibility of collision between HTC and ISS evaluation of flight status based on HTV telemetry, and evaluation of flight status after maneuvers. The HTVCC will house the functionality to perform HTV Training and Test. The training and test support will develop HTVCC training scenario and closed loop training using simulation software. Simulation capability will include GNC on-board software modeling, Sensor/Actuator mathematical modeling, environmental modeling (HTV dynamics, ISS dynamic, disturbance, etc) and, communication systems model (On-broad and ground systems) for both the TDRS link and ISS link. The HTVCC interfaces with SSCC via JEM Network System for HTV flight planning, command and telemetry, video, voice loops between HTVCC, SSCC and onboard crews related to HTV operations. The HTVCC will also house interface equipment for CCSDS processing of HTV command and telemetry for the TDRS Link. The HTVCC also interfaces with the launch site for HTV launch operation.

- o White Sands Complex (WSC): The WSC located in Las Cruces, New Mexico is the facility that houses the ground segment elements of the Tracking and Data Relay Satellite System (TDRSS). One element of the ground segment is the TDRSS Operations Control Center (TOCC). The TOCC controls and monitor the TDRSS spacecraft fleet and monitors TDRSS performance during active customer services.
- o Data Services Management Center (DSMC): The DSMC located at the WSC

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provides scheduling, controlling and monitoring of the SN. This function includes control of all available network resources, schedule processing, conflict resolution, and performance monitoring/fault isolation and acquisition data dissemination. These functions allow the SN users to receive User Performance Data (UPD), transmit Ground Control Messages Request (GCMR) and schedule SN services.

- o Network Integration Center (NIC): The NIC is located at the Goddard Flight Center (GSFC), Maryland. The NIC will monitor ISS activities as required such as Soyuz launch/docking, ISS mission critical periods, and ISS VHF ground station support.
- o Flight Dynamics Facility (FDF): Located at GSFC in Greenbelt, Maryland, the FDF will provide state vector data and tracking data evaluation support for the ISS, ATV, and HTV missions. The FDF also has the ability to provide orbit determination support if required. Real-time support is also provided for Space Shuttle missions and Launch Vehicles (ELV). Additional support is provided for TDRSS performance assessment for the STDN/TDRSS System using tracking data from the ISS, Space Shuttle, scientific satellites, and special test. TDRSS support includes state vector generation, orbit determination, tracking data evaluation, spacecraft maneuver support and testing to verify and improve TDRSS pointing accuracy. The FDF also provides spacecraft planning products to the DSMC and other spacecraft and launch vehicle control centers.

SUPPLIER: HSFS      AGENCY: DDMS/X      (DEPARTMENT OF DEFENSE      )

SUPPLIER COMMITMENT: NOACK      WILL COMMIT      RESPONSE DATE: 04/29/10

SUPPLIER: ER      AGENCY: 45 RANS/DOS      (E - 45TH SPACE WING      )

SUPPLIER COMMITMENT: NOACK      WILL COMMIT      RESPONSE DATE: 04/29/10

SUPPLIER: GSFC      AGENCY: GSFC/451      (GODDARD SPACE FLIGHT CENTER      )  
RESPONDER: ANTHONY WILLIAMS

SUPPLIER COMMITMENT: NOACK      WILL COMMIT      RESPONSE DATE: 04/29/10

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ITEM NUMBER: T1DEGHKX

SUPPLIER: MSFC AGENCY: MSFC/EO60 (MARSHALL SPACE FLIGHT CENTER )

SUPPLIER COMMITMENT: NOACK WILL COMMIT RESPONSE DATE: 04/29/10

SUPPLIER: KSC AGENCY: KSC/PH-B3B (K - KENNEDY SPACE CENTER )  
SUBSUPPLIER: BOEING P319 KA91-P346 P344  
UB-E

SUPPLIER COMMITMENT: NOACK WILL COMMIT RESPONSE DATE: 04/29/10

SUPPLIER: DFRC AGENCY: DFRC/XOS (X - DRYDEN FLIGHT RESEARCH CENTER )  
SUBSUPPLIER: FR

SUPPLIER COMMITMENT: NOACK WILL COMMIT RESPONSE DATE: 04/29/10

[PRD] DATABASE RECORD: 553436 REQUIREMENT STATUS: APPROVED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 10/24/08  
INITIAL DATE: 10/07/99  
ITEM NUMBER: T2DEGHKX DATE LAST CHANGED: 01/13/09  
SECTION: 1100 TIME LAST CHANGED: 10:53:04

REQUESTER: JSC  
TEST CODE: INFO

1. DESCRIPTION: SPACE VEHICLE DESCRIPTION

For the most current Space Vehicle Description, reference the International Space Station Program Baseline Configuration Document (SSP 50037, latest revision).

The Visiting Vehicles (VV's) currently included in the PRD are the Automated Transfer Vehicle (ATV) supplied by the European Space Agency (ESA) the H-II Transfer Vehicle (HTV) supplied by the Japan Aerospace Exploration Agency (JAXA) and vehicles vying for the Commercial Orbital Transportation Services (COTS) contract (NOTE: because of proprietary information, these Visiting Vehicles will have separate PRD Annexes covering their requirements on the Integrated Network). The ATV description can be found in SSP 50335, ESA/NASA/RSA Trilateral ATV Demonstration and Normal Operations Flight Plan and

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[PRD] DATABASE RECORD: 553436  
ITEM NUMBER: T2DEGHKX

SSP 41160, Segment Specification for the European Space Agency Segment.  
The HTV description can be found in SSP 50273, Segment Specification for  
the H-II Transfer Vehicle (HTV).

SUPPLIER: HSFS AGENCY: DDMS/X (DEPARTMENT OF DEFENSE )  
 SUPPLIER COMMITMENT: INFO WILL COMMIT RESPONSE DATE: 10/24/08

SUPPLIER: ER AGENCY: 45 RANS/DOU (45TH SPACE WING )  
 SUPPLIER COMMITMENT: INFO WILL COMMIT RESPONSE DATE: 10/24/08

SUPPLIER: GSFC AGENCY: GSFC/451 (GODDARD SPACE FLIGHT CENTER )  
 RESPONDER: ANTHONY WILLIAMS

SUPPLIER COMMITMENT: INFO WILL COMMIT RESPONSE DATE: 11/17/08

SUPPLIER: MSFC AGENCY: MSFC/EO60 (MARSHALL SPACE FLIGHT CENTER )  
 SUPPLIER COMMITMENT: INFO WILL COMMIT RESPONSE DATE: 11/14/08

SUPPLIER: KSC AGENCY: KSC/PZ-H-C (K - KENNEDY SPACE CENTER )  
 SUBSUPPLIER: KA91-P346 P344

SUPPLIER COMMITMENT: INFO WILL COMMIT RESPONSE DATE: 10/24/08

SUPPLIER: DFRC AGENCY: DFRC/OS (DRYDEN FLIGHT RESEARCH CENTER )  
 SUBSUPPLIER: FD

SUPPLIER COMMITMENT: INFO WILL COMMIT RESPONSE DATE: 10/24/08

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SECTION 1405 - TEST VEHICLE INSTRUMENTATION FREQUENCY SUMMARY

PUBLICATION DATE: 05/31/96      REVISION: 0000      RUN DATE: 04/29/10

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[PRD] DATABASE RECORD:	553814	REQUIREMENT STATUS:	APPROVED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	02/10/05
		INITIAL DATE:	11/09/99
ITEM NUMBER:	T1G	DATE LAST CHANGED:	04/08/05
SECTION:	1405	TIME LAST CHANGED:	09:38:40
REQUESTER:	JSC		
TEST CODE:	CORE		

1. DESCRIPTION:      SPECTRUM MANAGEMENT

OSF shall provide frequency and spectrum management services for all space-to-ground, ground-to-space, and space-to-space transmission links is specified in NASA RF Spectrum Management Manual (NPG 2570), and NASA Policy Directive (NPD)2570.5B.

SUPPLIER: GSFC      AGENCY: GSFC/451      (GODDARD SPACE FLIGHT CENTER      )  
RESPONDER: ANTHONY WILLIAMS

SUPPLIER COMMITMENT: WILCO      RESPONSE DATE: 04/06/05

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SECTION 2000 - TEST REQUIREMENTS/SUPPORT PLANS

PUBLICATION DATE: 05/31/96      REVISION: 0000      RUN DATE: 04/29/10

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[PRD] DATABASE RECORD:      533532      REQUIREMENT STATUS: APPROVED
DOCUMENT ID:                ISS VOL-I    APPROVAL DATE:         07/16/09
                               INITIAL DATE:         08/23/96
ITEM NUMBER:                T1G         DATE LAST CHANGED:    07/27/09
SECTION:                    2000        TIME LAST CHANGED:    12:53:43

REQUESTER:                  JSC
TEST CODE:                  CORE
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1. DESCRIPTION:            TRACKING AND DATA RELAY SATELLITE SYSTEM

The Tracking and Data Relay Satellite System (TDRSS) shall support the International Space Station (ISS) Program by providing S-Band and Ku-Band communications. TDRSS S-Band Single Access (SSA), S-Band Multiple Access (MA), and Ku-Band Single Access (KSA) capabilities shall support the various ISS Program Communications and Tracking (C&T) Systems.

TDRS Service for different ISS S-Band systems is required. These systems currently consist of the Assembly Contingency Subsystem (ACS) S-Band system, ATV S-Band system, HTV S-Band system, and commercial entities vying for the COTS contract. One SA service is required to support S and K-band RF link with a second SA service required during critical ISS operations such as rendezvous, EVA, VV launch, and other critical activities.

The ISS ACS SSAF link data rate operates at 72 kbps (High Data Rate mode) or 18 kbps (Low Data Rate mode). ACS SSAR link data rate operates at 192kbps (High Data Rate mode) and 24kbps (Low Data Rate mode).

TDRSS support is required for one ISS Ku-band service (forward and return) starting with the Space-to-Ground System (SGS) activation on flight 5A.1. The ISS SGS Ku-band return link signal is 150 Mbps containing payload data, video, and on-board recorded telemetry. The Ku-band return link data rate may be upgraded to 300 Mbps in the future.

ISS requires a Ku-band Single Access Forward (KSAF) link service. The KSAF will be either a PN spread signal or a 3 Mbps data modulated signal. The PN spread signal will be used for ISS antenna autotrack operations only and may be any PN code. The Ku-band forward link data rate may be upgraded to approximately 7-25 Mbps in the future.

The ATV S-Band system operates in MA at 8 kbps return link and 1 kbps

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[PRD] DATABASE RECORD: 533532  
ITEM NUMBER: T1G

forward link. The ATV S-band system operates in SSA at 8 or 64 kbps return link and 1 kbps forward link. The ATV shall require continuous TDRSS forward and return link, including the Zone of Exclusion (ZOE) during critical phases of flight. In addition, ATV will utilize TDRSS covering the attached phase periodically and will share TDRSS time with ISS.

The HTV S-band forward link system operates at 250 bps SSA only. No MA forward link is required; however, MA and SMA forward at 250 bps may be scheduled and supported on a best effort basis or for Station Development Test Objective (SDTO) purposes. The HTV S-band return link system operates in SSA at 8Kbps normal, or 2.0Kbps contingency. The HTV MA return link operates at 2.0Kbps normal. The HTV shall require continuous TDRSS forward and return link, including the Zone of Exclusion (ZOE) during critical phases of flight.

COTS requirements will be documented in separate PRD Annexes.

Detailed technical interface requirements and link performance requirements are specified in the ISS to Ground through TDRSS Interface Control Document (ICD) SSP 42018. (Non-continuous TDRSS support will be required for pre-flight testing of each service on a scheduled basis.

The ISS Program requires one dedicated SA service providing S-band and Ku-band single access service for prime ISS support, with continuous TDRSS coverage except for periods of interruption necessitated by ISS masking, the Zone of Exclusion (ZOE), or TDRS handover, with limited two SA support during critical events. Critical periods will be defined through negotiations between the GSFC Network Director and the ISS Program. Coverage during ZOE transit via the Guam Remote Ground Terminal (GRGT) is required for all ISS S-band elements but KSA services are not required during ZOE.

SUPPLIER: GSFC AGENCY: GSFC/451 (GODDARD SPACE FLIGHT CENTER )  
RESPONDER: TURONALD BANKS

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 07/23/09

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[PRD] DATABASE RECORD: 533532  
ITEM NUMBER: T1G

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[PRD] DATABASE RECORD: 534321 REQUIREMENT STATUS: APPROVED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 10/24/08  
INITIAL DATE: 08/23/96  
ITEM NUMBER: T2GT DATE LAST CHANGED: 01/15/09  
SECTION: 2000 TIME LAST CHANGED: 14:36:29  
  
REQUESTER: JSC  
TEST CODE: CORE

1. DESCRIPTION: TDRSS GROUND STATION CONFIGURATION

Ground Configuration Message Requests (GCMRs) and GCMR acknowledgements for the ISS shall share the same communications interface as the Shuttle messages of the same type. The SSCC shall provide conflict-free GCMRs and TDRSS link management for all ISS elements including ISS, ATV, and HTV.

SUPPLIER: GSFC AGENCY: GSFC/450.3 (G - GODDARD SPACE FLIGHT CENTER )  
RESPONDER: ANTHONY WILLIAMS

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 01/15/09

SUPPLIER: JSC AGENCY: JSC/DD (JOHNSON SPACE CENTER )

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 10/24/08

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[PRD] DATABASE RECORD: 534320 REQUIREMENT STATUS: DELETED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 02/10/05  
  
ITEM NUMBER: T3GT

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[PRD] DATABASE RECORD: 534322 REQUIREMENT STATUS: APPROVED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 11/10/08  
INITIAL DATE: 08/23/96  
ITEM NUMBER: T4G DATE LAST CHANGED: 11/18/08  
SECTION: 2000 TIME LAST CHANGED: 09:18:02

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[PRD] DATABASE RECORD: 534322  
ITEM NUMBER: T4G

REQUESTER: JSC  
TEST CODE: CORE

1. DESCRIPTION: SSCC AND HOSC USER PERFORMANCE DATA MESSAGES (UPD)

User Performance Data (UPD) messages for all ISS elements shall simultaneously share the same communications interface as the Shuttle messages of the same type.

SUPPLIER: GSFC AGENCY: GSFC/450.3 (G - GODDARD SPACE FLIGHT CENTER )  
RESPONDER: ANTHONY WILLIAMS

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 11/17/08

[PRD] DATABASE RECORD: 533534 REQUIREMENT STATUS: APPROVED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 04/08/99  
INITIAL DATE: 08/23/96  
ITEM NUMBER: T5G DATE LAST CHANGED: 10/24/08  
SECTION: 2000 TIME LAST CHANGED: 10:18:26

REQUESTER: JSC  
TEST CODE: CORE

1. DESCRIPTION: SYSTEM VERIFICATION

GSFC will support a validation/verification process that demonstrates compatibility, technical performance, capabilities, and operational readiness between ISS elements and the TDRSS, GN and VHF communication systems.

The NASA Integrated Services Network (NISN) will support a validation/verification process that demonstrates technical performance, capabilities, and operational readiness of all NISN provided Ground to Ground communications services.

SUPPLIER: GSFC AGENCY: GSFC/450.3 (G - GODDARD SPACE FLIGHT CENTER )

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 05/21/99

CLASSIFICATION UNCLASSIFIED

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OPERATIONS REQUIREMENT/OPERATIONS DIRECTIVE (PRD/PSP/OR/OD)  
PROGRAM NUMBER: 30000

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PUBLICATION DATE: 05/31/96 REVISION: 0000 RUN DATE: 04/29/10

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[PRD] DATABASE RECORD: 533534  
ITEM NUMBER: T5G

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[PRD] DATABASE RECORD: 533537 REQUIREMENT STATUS: APPROVED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 10/24/08  
INITIAL DATE: 08/23/96  
ITEM NUMBER: HT6G DATE LAST CHANGED: 11/18/08  
SECTION: 2000 TIME LAST CHANGED: 09:16:09

REQUESTER: MSFC JSC  
TEST CODE: CORE

1. DESCRIPTION: SECURITY REQUIREMENTS

NISN provided communications services shall comply with NASA Procedures and Requirements (NPR) 2810.1, "Security of Information Technology" (latest revision), and FIPS Publication 200, "Minimum Security Requirements for Federal Information and Information Systems". The latter documents directs Federal agencies to implement baseline controls from NIST 800-53, "Recommended Security Controls for Federal Information Systems", as applicable to the sensitivity of the data the equipment or system processes.

The following are data sensitivity classifications used throughout this document in reference to services listed below:

"Space Operations Information" refers to those mission services having the security category (confidentiality, Low), (integrity, High), (availability, High), according to the security classification method required by FIPS Publication 199, "Standards for Security Categorization of Federal Information and Information Systems". See NIST 800-60, "Guide for Mapping Types of Information and Information Systems to Security Categories", volume 2, section D.11.4, "Space Operations Information Type". These services were formerly known as MSN and AIS Level 3.

"Space Exploration Information" refers to those mission services having the security category: (confidentiality, Low), (integrity, Moderate), (availability, Low), except as modified below by explicit requirements for a particular service. See NIST 800-60, "Guide for Mapping Types of Information and Information Systems to Security Categories", volume 2, section D.19.2, "Space Exploration and Innovation

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[PRD] DATABASE RECORD: 533537  
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Information Type". These services were formerly known as SER and AIS Level 2.

In addition, the users of NISN services shall comply with the NMI 8610.11 (latest revision, which has expired). "Control of Access to Operational Voice Communication Circuits" (and it's eventual replacement policy currently being drafted by JSC/MOD/DA8) to preclude unauthorized access and potential damage to operational systems and user security. Inter-facility Interface Control Document (ICD's) shall address security.

SUPPLIER: GSFC AGENCY: GSFC/450.3 (G - GODDARD SPACE FLIGHT CENTER )  
 RESPONDER: ANTHONY WILLIAMS

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 11/17/08

[PRD] DATABASE RECORD:	544759	REQUIREMENT STATUS:	APPROVED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	10/07/99
ITEM NUMBER:	T7G	INITIAL DATE:	04/24/98
SECTION:	2000	DATE LAST CHANGED:	07/03/02
		TIME LAST CHANGED:	08:05:36
REQUESTER:	JSC		
TEST CODE:	CORE		

1. DESCRIPTION: NETWORK MANAGEMENT

The Program requires the Mission Services Program to provide network management services for all communications networks. These services shall include, but not be limited to: scheduling, monitoring performance, providing status to the Program, and providing network configuration management.

The networks provided shall be managed and operated in such a way as to minimize the need for operational interaction between network operators and SSCC/POIC operators and/or payload users.

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[PRD] DATABASE RECORD: 544759  
ITEM NUMBER: T7G

SUPPLIER: GSFC AGENCY: GSFC/450.3 (G - GODDARD SPACE FLIGHT CENTER )

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 01/26/01

[PRD] DATABASE RECORD: 553521 REQUIREMENT STATUS: DELETED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 01/25/01

ITEM NUMBER: T8G

[PRD] DATABASE RECORD: 553522 REQUIREMENT STATUS: DELETED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 01/25/01

ITEM NUMBER: T9GT

[PRD] DATABASE RECORD: 553523 REQUIREMENT STATUS: DELETED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 01/25/01

ITEM NUMBER: T10GKT

[PRD] DATABASE RECORD: 558535 REQUIREMENT STATUS: APPROVED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 01/30/03  
INITIAL DATE: 02/07/01  
ITEM NUMBER: T11G DATE LAST CHANGED: 02/28/03  
SECTION: 2000 TIME LAST CHANGED: 14:36:50

REQUESTER: JSC  
TEST CODE: CORE

1. DESCRIPTION: WSC QUALITY OR SERVICE

The data systems at the White Sands Complex (WSC) shall monitor the systems supporting the forward and return data services for all ISS elements requiring TDRSS support. User Performance Data (UPD) shall be transmitted to the SSCC, GSFC NIC, and the HOSC.

SUPPLIER: GSFC AGENCY: GSFC/450 (GODDARD SPACE FLIGHT CENTER )

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 02/28/03

CLASSIFICATION UNCLASSIFIED

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[PRD] DATABASE RECORD: 558535  
ITEM NUMBER: T11G

[PRD] DATABASE RECORD: 582705 REQUIREMENT STATUS: DELETED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 04/29/10

ITEM NUMBER: T12G

[PRD] DATABASE RECORD: 591223 REQUIREMENT STATUS: APPROVED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 03/30/07  
INITIAL DATE: 03/30/07  
ITEM NUMBER: HT51G DATE LAST CHANGED: 04/11/07  
SECTION: 2000 TIME LAST CHANGED: 10:31:40

REQUESTER: MSFC JSC  
TEST CODE: CORE

1. DESCRIPTION: SSCC TO HOSC INTERFACE FOR BCC OPERATIONS

The following will be provided for BCC operation between JSC/SSCC to MSFC/HOSC:

- a. A circuit of 10Mbps shall be provided for SSL-encrypted exceed on demand client server session.
- b. A NISN PIP service is required.
- c. The interface shall provide security appropriate for "Space Exploration Information".
- d. Refer to the Certification for the Huntsville Operations Support Center ISS Interim Backup Control Center capabilities (HOSC-IBCC-711) for detailed interface requirements.

SUPPLIER: GSFC AGENCY: GSFC/450.1 (GODDARD SPACE FLIGHT CENTER )  
RESPONDER: ANTHONY WILLIAMS

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 04/10/07

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SECTION 2100 - METRIC DATA

PUBLICATION DATE: 05/31/96 REVISION: 0000 RUN DATE: 04/29/10

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[PRD] DATABASE RECORD: 533540 REQUIREMENT STATUS: APPROVED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 10/29/08  
INITIAL DATE: 08/23/96  
ITEM NUMBER: EGT2GT DATE LAST CHANGED: 11/18/08  
SECTION: 2100 TIME LAST CHANGED: 09:19:30  
  
REQUESTER: ER GSFC JSC  
TEST CODE: CORE

1. DESCRIPTION: TDRS STATE VECTORS

When required, the GSFC FDF shall provide the SSCC and BCC-HOSC (when activated) with Tracking and Data Relay Satellite (TDRS) state vectors for ISS-to-TDRS pointing computations and for Visiting Vehicles -to-TDRS pointing computations to the SSCC. TDRS state vectors for ATV and HTV support will be supplied by the SSCC to the ESA and NASDA gateways as required. The TDRS state vectors accuracy requirement is 200 meters, three sigma. State vector formats are specified in JSC/GSFC Operational Communications ICD for MCC Systems (JSC 11534, Vol.1, latest revision). Vectors will be transmitted between FDF and SSCC via ISSOnet.

SUPPLIER: GSFC AGENCY: GSFC/450.3 (G - GODDARD SPACE FLIGHT CENTER )  
RESPONDER: ANTHONY WILLIAMS

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 11/17/08

SUPPLIER: JSC AGENCY: JSC/DD (JOHNSON SPACE CENTER )  
RESPONDER: NACAIT

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 10/29/08

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[PRD] DATABASE RECORD: 533541 REQUIREMENT STATUS: APPROVED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 02/11/02  
INITIAL DATE: 08/23/96  
ITEM NUMBER: T3G DATE LAST CHANGED: 03/27/07  
SECTION: 2100 TIME LAST CHANGED: 14:46:04  
  
REQUESTER: JSC  
TEST CODE: CORE

1. DESCRIPTION: ISS TRANSMITTED FREQUENCY MEASUREMENT

The GSFC FDF shall process ACS S-band, ATV S-Band, HTV S-band, and

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PUBLICATION DATE: 05/31/96 REVISION: 0000 RUN DATE: 04/29/10

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[PRD] DATABASE RECORD: 533541  
ITEM NUMBER: T3G

Ku-Band one way doppler data to be used for determining the operational short and long term stability of the ISS transponders. This processing shall be provided, when scheduled, until transponders frequency shift signatures are established for all S-Band services and the Ku-Band services. Results shall be provided to the SSCC for use in estimating the required frequency information in the TDRSS scheduling and ground control messages.

The responsible Visiting Vehicle control center shall process appropriate data to be used for determining the operational short and long term stability of the transponders. This processing shall be provided when scheduled until transponder frequency shift signatures are established for S-Band services. Results shall be provided to the SSCC, ATVCC, and HTVCC for use in estimating the required frequency information in the TDRSS scheduling and ground control messages.

SUPPLIER: GSFC AGENCY: GSFC/450.3 (G - GODDARD SPACE FLIGHT CENTER )

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 03/14/02

[PRD] DATABASE RECORD: 551187 REQUIREMENT STATUS: APPROVED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 10/29/08  
INITIAL DATE: 04/13/99  
ITEM NUMBER: GT4G DATE LAST CHANGED: 11/18/08  
SECTION: 2100 TIME LAST CHANGED: 09:20:15

REQUESTER: GSFC JSC  
TEST CODE: CORE

1. DESCRIPTION: ISS STATE VECTORS

The JSC SSCC and BCC-HOSC (when activated) shall provide, as required ISS, ATV, HTV, and Soyuz acquisition data to the TDRS via GSFC FDF. The ATV and HTV acquisition data shall be provided by the ATV and HTV Control Centers, respectively, to the SSCC. State Vector formats are specified in JSC/GSFC Operational Communications ICD for MCC Systems

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PUBLICATION DATE: 05/31/96 REVISION: 0000 RUN DATE: 04/29/10

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[PRD] DATABASE RECORD: 551187  
ITEM NUMBER: GT4G

(JSC 121534, Vol. 1, latest revision) Vectors will be transmitted  
between FDF and SSCC via ISSOnet.

SUPPLIER: GSFC AGENCY: GSFC/450.3 (G - GODDARD SPACE FLIGHT CENTER )

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 11/17/08

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[PRD] DATABASE RECORD: 556069 REQUIREMENT STATUS: APPROVED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 12/19/07  
INITIAL DATE: 06/23/00  
ITEM NUMBER: T6EGX DATE LAST CHANGED: 01/15/09  
SECTION: 2100 TIME LAST CHANGED: 14:39:40

REQUESTER: JSC  
TEST CODE: CORE

1. DESCRIPTION: C-BAND RADAR SUPPORT

NASA and DOD C-Band radar support is required for ISS free flyer support. Support is currently estimated at approximately 15 passes per year and will be scheduled as required. Currently, use of C-Band Metric Data is to support the:

1. Tracking of the Soyuz to provide updated pointing information for the VHF 2 communications systems at the NASA VHF stations.

2. Other ISS free flying elements including Progress, HTV, and ATV as required.

NOTE: For ATV's first mission, an additional 7 C-band passes are required for post insertion and the Collision Avoidance Maneuver.

SUPPLIER: ER AGENCY: 45 RANS/DOU (45TH SPACE WING )  
RESPONDER: MICHAEL GAWEL

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 12/20/07



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SECTION 2200 - TELEMETRY DATA

PUBLICATION DATE: 05/31/96      REVISION: 0000      RUN DATE: 04/29/10

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[PRD] DATABASE RECORD:      533542      REQUIREMENT STATUS: APPROVED
DOCUMENT ID:                ISS VOL-I   APPROVAL DATE:        03/11/09
                               INITIAL DATE:        08/23/96
ITEM NUMBER:                T1G        DATE LAST CHANGED:   01/22/10
SECTION:                    2200      TIME LAST CHANGED:   15:27:32

REQUESTER:                  JSC
TEST CODE:                  CORE
    
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1. DESCRIPTION:      WSC RECORDING INTERVAL

The ATV and HTV S-Band return links shall be recorded at the White Sands Complex (WSC) for all ISS elements and held for a period of 50 hours or longer if specifically requested. Playback shall be required in the event of communications or facility failures. Playback of S-band data shall occur simultaneously (on a separate channel) with real-time support. Playback of ATV and HTV S-Band data shall utilize one common, shared playback channel.

NOTE: ACS and Ku-Band return links are recorded by ISSOnet equipment located at WSC.

SUPPLIER: GSFC      AGENCY: GSFC/451      (GODDARD SPACE FLIGHT CENTER      )  
 RESPONDER: TURONALD BANKS

SUPPLIER COMMITMENT: WILCO      RESPONSE DATE: 01/21/10

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[PRD] DATABASE RECORD:      533544      REQUIREMENT STATUS: APPROVED
DOCUMENT ID:                ISS VOL-I   APPROVAL DATE:        10/29/08
                               INITIAL DATE:        08/23/96
ITEM NUMBER:                T2G        DATE LAST CHANGED:   11/18/08
SECTION:                    2200      TIME LAST CHANGED:   09:23:18

REQUESTER:                  JSC
TEST CODE:                  CORE
    
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1. DESCRIPTION:      ASSEMBLY CONTINGENCY SUBSYSTEM (ACS) S-BAND  
 RETURN SERVICE FROM WSC TO SSCC

The ACS SSAR link data rate operates at 192 kbps (High Data Rate mode), and 24 kbps (Low Date Rate mode). The ISS ACS System can be operated coherently or non-coherently, but generally in the non-coherent mode.

The requirements for the ACS S-Band return from WSC to SSCC are as

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[PRD] DATABASE RECORD: 533544  
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follows:

- a. the following data services will be transported via the ISSOnet.
- b. A 192 / 24 service shall be provided for the transfer of S-Band downlink telemetry.
- c. A 192 / 24 service shall be provided for the transfer of recorded S-Band downlink telemetry. The recorded HTV S-Band service and recorded ATV S-Band service shall share a single ISS recorded S-Band service configurable to 192/64/24/8/2/1 kbps data rate.
- d. A 72/18 service shall be provided for the transfer of S-Band ISS command echo.
- e. The communications service shall be capable of handling rate changes between 192 kbps and 24 kbps
- f. Refer to TBS for detailed interface requirements.

SUPPLIER: GSFC AGENCY: GSFC/451 (GODDARD SPACE FLIGHT CENTER )  
RESPONDER: ANTHONY WILLIAMS

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 11/17/08

[PRD] DATABASE RECORD: 533545 REQUIREMENT STATUS: DELETED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 02/11/05

ITEM NUMBER: H3G

[PRD] DATABASE RECORD: 533546 REQUIREMENT STATUS: APPROVED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 02/11/05  
INITIAL DATE: 08/23/96  
ITEM NUMBER: T4G DATE LAST CHANGED: 03/11/09  
SECTION: 2200 TIME LAST CHANGED: 15:59:14

REQUESTER: JSC  
TEST CODE: CORE

1. DESCRIPTION: Ku-BAND RETURN DATA FROM WSC TO THE SSCC

NISN shall provide a fiber terrestrial communications network for the distribution of ISS KU-Band downlink data. This network shall support data rates from 50 Mbps to 150 Mbps.

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PROGRAM NUMBER: 30000

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[PRD] DATABASE RECORD: 533546  
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The requirements for Ku-Band return data to the SSCC are as follows:

- a. The input to the network shall be IP packets, and the output to the SSCC is required to be in the same format as that provided to the network.
- b. NISN shall provide a 56 kbps out-of-band frame relay cloud for network management and status reporting.
- c. The total service availability of the network shall not be less than 0.9995 percent.
- d. The maximum downtime shall not exceed 2 hours for any single outage.
- e. A NISN Mission Critical Service is required.
- f. The interface shall provide security appropriate for "Space Exploration Information".
- g. The maximum acceptable packet loss is .001 percent.
- h. The one-way data transport delay shall not exceed 100 ms.
- i. The communications service shall be transparent to the SSCC (i.e., the data shall be presented by the communications equipment to the SSCC in the same format as that presented by the WSC to the communications equipment. Any overhead added by the communications service shall be removed from the data prior to delivery to the SSCC and shall require no additional processing or data handling capabilities on the part of the SSCC. The data provided by the WSC shall not be altered by the communications service).
- j. Reference MSFC-PLAN-3340, IDEA Development Plan for more detailed requirements.

SUPPLIER: GSFC      AGENCY: GSFC/451      (GODDARD SPACE FLIGHT CENTER      )  
RESPONDER: ANTHONY WILLIAMS

SUPPLIER COMMITMENT: WILCO      RESPONSE DATE: 04/06/05  
RESPONSE:

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[PRD] DATABASE RECORD:	533547	REQUIREMENT STATUS:	DELETED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	02/11/05

ITEM NUMBER: H5G

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[PRD] DATABASE RECORD:	544835	REQUIREMENT STATUS:	DELETED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	05/14/01

ITEM NUMBER: T6G

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[PRD] DATABASE RECORD:	544836	REQUIREMENT STATUS:	DELETED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	02/07/01

ITEM NUMBER: HT7G

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[PRD] DATABASE RECORD:	551185	REQUIREMENT STATUS:	DELETED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	01/25/01

ITEM NUMBER: T8GJSX

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[PRD] DATABASE RECORD:	551186	REQUIREMENT STATUS:	DELETED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	10/12/99

ITEM NUMBER: HT9G

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[PRD] DATABASE RECORD:	551230	REQUIREMENT STATUS:	DELETED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	10/12/99

ITEM NUMBER: T10GT

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[PRD] DATABASE RECORD:	551231	REQUIREMENT STATUS:	DELETED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	10/12/99

ITEM NUMBER: T11GT

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[PRD] DATABASE RECORD:	551232	REQUIREMENT STATUS:	DELETED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	10/12/99

ITEM NUMBER: HT12G

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[PRD] DATABASE RECORD:	553524	REQUIREMENT STATUS:	DELETED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	01/25/01

ITEM NUMBER: T13G

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[PRD] DATABASE RECORD:	553526	REQUIREMENT STATUS:	APPROVED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	10/29/08
		INITIAL DATE:	11/04/99
ITEM NUMBER:	T14G	DATE LAST CHANGED:	11/18/08
SECTION:	2200	TIME LAST CHANGED:	09:23:44

REQUESTER: JSC  
 TEST CODE: CORE

1. DESCRIPTION:      ATV S-BAND RETURN FROM WSC TO SSCC

The ATV SSAR link data rate operates at 64 or 8 kbps. The ATV S-band MA Return link data rate operates at 8 Kbps. The ATV S-band system can be operated coherently or non-coherently. ATV requirement for TDRSS coherent mode operation is the ATV tracking purposes only.

- a. An 8/64 kbps, synchronous, serial bit-stream data and clock service shall be provided for the transfer of S-Band downlink telemetry.
- b. An 8/64 kbps, synchronous, serial bit-stream data and clock service shall be provided for the transfer of recorded S-band downlink telemetry. The recorded HTV S-band service and recorded ATV S-Band service shall share a single ISS recorded S-Band service configurable to 192/64/24/8/2/1 kbps data rates.
- c. A 1 kbps, synchronous, serial bit-stream data and clock service shall be provided for the transfer of ATV command echo.
- d. A NISN Real-time Critical Service is required.
- e. The interface shall provide security appropriate for "Space Operations Information".
- f. The data transport delay shall not exceed 600 ms from WSC to SSCC. The delay shall not vary.
- g. The maximum bit error rate shall be 10E-6.
- h. The communications service shall be transparent to the ESA Gateway. (i.e., the data shall be presented by the communications equipment to the ESA Gateway in the same format as that presented by the WSC to the communications equipment. Any overhead added by the communications service shall be removed from the data prior to delivery to the ESA Gateway and shall require no additional processing or handling capabilities on the part of the ESA Gateway.

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[PRD] DATABASE RECORD: 553526  
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The data provided by the WSC shall not be altered by the communications service).

- i. The communications service shall be capable of handling rate changes between 8 and 64 kbps.
- j. Refer to JSC/GSFC Operational Communications ICD for MCC Systems (JSC 11534, Vol. I, latest revision.) for detailed interface requirements.

SUPPLIER: GSFC AGENCY: GSFC/450.3 (G - GODDARD SPACE FLIGHT CENTER )  
RESPONDER: ANTHONY WILLIAMS 301 805-3459

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 11/17/08

[PRD] DATABASE RECORD: 553529 REQUIREMENT STATUS: APPROVED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 10/29/08  
INITIAL DATE: 11/05/99  
ITEM NUMBER: T15G DATE LAST CHANGED: 11/18/08  
SECTION: 2200 TIME LAST CHANGED: 09:24:34

REQUESTER: JSC  
SUBREQUESTER: HTV  
TEST CODE: CORE

1. DESCRIPTION: HTV S-BAND RETURN FROM WSC TO SSCC

The HTV SSAR link data rate operates at 8 and 2 Kbps. The HTV S-band MA Return link data rate operates at 2 Kbps. The HTV S-band system can be operated coherently or non-coherently. HTV requirement for TDRSS coherent mode operation is for HTV tracking purposes only.

- a. An 8 and 2 Kbps, synchronous, serial bit-stream data and clock service shall be provided for the transfer of S-band downlink telemetry.
- b. An 8 and 2 Kbps, synchronous, serial bit-stream data and clock service shall be provided for the transfer of recorded S-band downlink telemetry. The recorded HTV S-band service, and recorded ATV S-Band service

CLASSIFICATION UNCLASSIFIED

INTERNATIONAL SPACE STATION ORBITAL VOL-I  
PROGRAM REQUIREMENTS DOCUMENT/PROGRAM SUPPORT PLAN/  
OPERATIONS REQUIREMENT/OPERATIONS DIRECTIVE (PRD/PSP/OR/OD)  
PROGRAM NUMBER: 30000

SECTION 2200 - TELEMETRY DATA

PUBLICATION DATE: 05/31/96 REVISION: 0000 RUN DATE: 04/29/10

\*\*\*CONTINUED\*\*\*

[PRD] DATABASE RECORD: 553529  
ITEM NUMBER: T15G

- shall share a single ISS recorded S-band service configured to 192/64/24/8/2/1 kbps data rates.
- c. A 250 bps, synchronous, serial bit-stream data and clock service shall be provided for the transfer of HTV command echo.
  - d. A NISN Real-time Critical Service is required.
  - e. The interface shall provide security appropriate for "Space Operations Information".
  - f. The data transport delay shall not exceed 600 ms from WSC to SSCC. The delay shall not vary.
  - g. The maximum bit error rate shall be 10E-6.
  - h. The communications service shall be transparent to the NASDA Gateway. (i.e., the data shall be presented by the communications equipment to the NASDA Gateway in the same format as that presented by the WSC to the communications equipment. Any overhead added by the communications service shall be removed from the data prior to delivery to the NASDA Gateway and shall require no additional processing or data handling capabilities on the part of the NASDA Gateway. The data provided by the WSC shall not be altered by the communications service).
  - i. The communications service shall be capable of handling rate changes between 8 and 2 Kbps.
  - j. Refer to JSC/GSFC Operational Communications ICD for MCC Systems (JSC 11534, Vol. I, latest revision) for detailed interface requirements.

SUPPLIER: GSFC AGENCY: GSFC/450.3 (G - GODDARD SPACE FLIGHT CENTER )  
RESPONDER: ANTHONY WILLIAMS

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 11/17/08

[PRD] DATABASE RECORD: 553533 REQUIREMENT STATUS: DELETED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 01/25/01

ITEM NUMBER: T16G

CLASSIFICATION UNCLASSIFIED

INTERNATIONAL SPACE STATION ORBITAL VOL-I  
PROGRAM REQUIREMENTS DOCUMENT/PROGRAM SUPPORT PLAN/  
OPERATIONS REQUIREMENT/OPERATIONS DIRECTIVE (PRD/PSP/OR/OD)  
PROGRAM NUMBER: 30000

SECTION 2200 - TELEMETRY DATA

PUBLICATION DATE: 05/31/96 REVISION: 0000 RUN DATE: 04/29/10

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[PRD] DATABASE RECORD: 553533  
ITEM NUMBER: T16G

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[PRD] DATABASE RECORD: 553542 REQUIREMENT STATUS: DELETED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 01/25/01

ITEM NUMBER: T17GT  
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CLASSIFICATION UNCLASSIFIED

INTERNATIONAL SPACE STATION ORBITAL VOL-I  
PROGRAM REQUIREMENTS DOCUMENT/PROGRAM SUPPORT PLAN/  
OPERATIONS REQUIREMENT/OPERATIONS DIRECTIVE (PRD/PSP/OR/OD)  
PROGRAM NUMBER: 30000

SECTION 2300 - COMMAND SYSTEMS

PUBLICATION DATE: 05/31/96 REVISION: 0000 RUN DATE: 04/29/10

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[PRD] DATABASE RECORD:	533549	REQUIREMENT STATUS:	DELETED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	06/26/00

ITEM NUMBER: T1GT

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[PRD] DATABASE RECORD:	544837	REQUIREMENT STATUS:	DELETED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	05/14/01

ITEM NUMBER: T2G

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[PRD] DATABASE RECORD:	544838	REQUIREMENT STATUS:	APPROVED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	03/11/09
		INITIAL DATE:	04/30/98
ITEM NUMBER:	HT3G	DATE LAST CHANGED:	01/22/10
SECTION:	2300	TIME LAST CHANGED:	15:28:07

REQUESTER: MSFC JSC  
TEST CODE: CORE

1. DESCRIPTION: ASSEMBLY CONTINGENCY SUBSYSTEM (ACS) S-BAND  
FORWARD SUPPORT FROM SSCC TO WSC

The ISS ACS SSAF link data rate operates at 72 kbps (High Data Rate mode) or 18 kbps (Low Data Rate mode).

- a. The following data services will be transported via the ISSOnet.
- b. A 72 /18 service shall be provided for the transfer of spacecraft uplink data.
- c. Refer to TBS for detailed interface requirements.
- d. The communications service shall be capable of supporting rate changes between 72 kbps and 18 kbps.

SUPPLIER: GSFC AGENCY: GSFC/450.3 (G - GODDARD SPACE FLIGHT CENTER )  
RESPONDER: TURONALD BANKS

SUPPLIER COMMITMENT: WILCO SEE RESPONSE RESPONSE DATE: 01/21/10  
RESPONSE:

CLASSIFICATION UNCLASSIFIED

INTERNATIONAL SPACE STATION ORBITAL VOL-I  
PROGRAM REQUIREMENTS DOCUMENT/PROGRAM SUPPORT PLAN/  
OPERATIONS REQUIREMENT/OPERATIONS DIRECTIVE (PRD/PSP/OR/OD)  
PROGRAM NUMBER: 30000

SECTION 2300 - COMMAND SYSTEMS

PUBLICATION DATE: 05/31/96 REVISION: 0000 RUN DATE: 04/29/10

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[PRD] DATABASE RECORD: 544838  
ITEM NUMBER: HT3G

[PRD] DATABASE RECORD: 553538 REQUIREMENT STATUS: DELETED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 01/25/01

ITEM NUMBER: T4GT

[PRD] DATABASE RECORD: 553539 REQUIREMENT STATUS: APPROVED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 03/11/09  
INITIAL DATE: 11/05/99  
ITEM NUMBER: T5GT DATE LAST CHANGED: 01/22/10  
SECTION: 2300 TIME LAST CHANGED: 15:28:42

REQUESTER: JSC  
SUBREQUESTER: HTV  
TEST CODE: CORE

1. DESCRIPTION: HTV S-BAND FORWARD SUPPORT FROM SSCC TO WSC

The HTV S-Band forward link system operates at 250 bps.

- a. A 250 bps, synchronous, serial bit-stream data and clock service shall be provided for the transfer of spacecraft uplink data.
- b. A NISN Real-time Critical Service is required.
- c. The interface shall provide security appropriate for "Space Operations Information".
- d. The data transport delay shall not exceed 400ms from SSCC to WSC. The delay shall not vary.
- e. The maximum bit error rate shall be 10E-6.
- f. The communications service shall be transparent to the WSC. (i.e., the data shall be presented by the communications equipment to the WSC in the same format as that presented by the SSCC to the communications equipment. Any overhead added by the communications service shall be removed from the data prior to delivery to the WSC and shall require no additional processing or data handling capabilities on the part of the WSC. The data provided by the SSCC shall not be altered by the communications service).

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INTERNATIONAL SPACE STATION ORBITAL VOL-I  
PROGRAM REQUIREMENTS DOCUMENT/PROGRAM SUPPORT PLAN/  
OPERATIONS REQUIREMENT/OPERATIONS DIRECTIVE (PRD/PSP/OR/OD)  
PROGRAM NUMBER: 30000

SECTION 2300 - COMMAND SYSTEMS

PUBLICATION DATE: 05/31/96      REVISION: 0000      RUN DATE: 04/29/10

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[PRD] DATABASE RECORD: 553539  
ITEM NUMBER: T5GT

- g. Refer to JSC/GSFC Operational Communications ICD for MCC Systems (JSC 11534, Vol. I, latest revision) for detailed interface requirements.

SUPPLIER: GSFC      AGENCY: GSFC/451      (GODDARD SPACE FLIGHT CENTER      )  
RESPONDER: TURONALD BANKS

SUPPLIER COMMITMENT: WILCO      RESPONSE DATE: 01/21/10

SUPPLIER: JSC      AGENCY: JSC/DD      (JOHNSON SPACE CENTER      )  
RESPONDER: JOE AQUINO

SUPPLIER COMMITMENT: WILCO      RESPONSE DATE: 03/11/09

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[PRD] DATABASE RECORD:	553540	REQUIREMENT STATUS:	APPROVED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	03/11/09
ITEM NUMBER:	T6GT	INITIAL DATE:	11/05/99
SECTION:	2300	DATE LAST CHANGED:	03/11/09
		TIME LAST CHANGED:	16:03:20

REQUESTER: JSC  
SUBREQUESTER: ATV  
TEST CODE: CORE

1. DESCRIPTION:      ATV S-BAND FORWARD SUPPORT FROM SSCC TO WSC

The ISS S-band Single Access Forward (SSAF) link and/or S-band MA forward links originate at the SSCC and shall be transported to the WSC. The ATV SSAF link operates at 1Kbps. The ATV S-band forward link data rate operates at 1 Kbps in MA.

- a. A 1 kbps, synchronous, serial bit-stream data and clock service shall be provided for the transfer of spacecraft uplink data.
- b. A NISN Real-time Critical Service is required.
- c. The Interface shall provide security appropriate for

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PROGRAM NUMBER: 30000

SECTION 2300 - COMMAND SYSTEMS

PUBLICATION DATE: 05/31/96 REVISION: 0000 RUN DATE: 04/29/10

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[PRD] DATABASE RECORD: 553540  
ITEM NUMBER: T6GT

- "Space Operations Information".
- d. The data transport delay shall not exceed 400 ms from SSCC to WSC. The delay shall not vary.
- e. The maximum bit error rate shall be 10E-6.
- f. The communications service shall be transparent to the WSC. (i.e., the data shall be presented by the communications equipment to the WSC in the same format as that presented by the SSCC to the communications equipment. Any overhead added by the communications service shall be removed from the data prior to delivery to the WSC and shall require no additional processing or data handling capabilities on the part of the WSC. The data provided by the SSCC shall not be altered by the communications service).
- g. Refer to JSC/GSFC Operational Communications ICD for MCC Systems (JSC 11534, Vol. I, latest revision) for detailed interface requirements.

SUPPLIER: GSFC AGENCY: GSFC/450.3 (G - GODDARD SPACE FLIGHT CENTER )

SUPPLIER COMMITMENT: NOACK RESPONSE DATE: 03/11/09

SUPPLIER: JSC AGENCY: JSC/DD (JOHNSON SPACE CENTER )

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 03/11/09

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[PRD] DATABASE RECORD:	553541	REQUIREMENT STATUS:	APPROVED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	11/03/08
		INITIAL DATE:	11/05/99
ITEM NUMBER:	T7GT	DATE LAST CHANGED:	11/18/08
SECTION:	2300	TIME LAST CHANGED:	09:29:16

REQUESTER: JSC  
TEST CODE: CORE

1. DESCRIPTION: KU-BAND FORWARD SUPPORT FROM SSCC TO WSC

INTERNATIONAL SPACE STATION ORBITAL VOL-I  
PROGRAM REQUIREMENTS DOCUMENT/PROGRAM SUPPORT PLAN/  
OPERATIONS REQUIREMENT/OPERATIONS DIRECTIVE (PRD/PSP/OR/OD)  
PROGRAM NUMBER: 30000

SECTION 2300 - COMMAND SYSTEMS

PUBLICATION DATE: 05/31/96      REVISION: 0000      RUN DATE: 04/29/10

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[PRD] DATABASE RECORD: 553541  
ITEM NUMBER: T7GT

The ISS requires either a pseudo-random (PN) spread or data modulated Ku-band Single Access Forward (KSAF) link. A given TDRSS support event may contain modulation or PN spreading, but not at the same time. The service will be configured by Ground Control Message Requests (GCMR) during the event to switch between data modulated or PN spread.

Data will originate at the SSCC and be transported to WSC at 3 Mbps. In the future, an ISS upgrade to accommodate a data rate of 7 Mbps may occur.

The PN spreading is used by the ISS for autotrack operations only and can be any PN code.

NISN shall provide a fiber terrestrial communications network for the distribution of ISS Ku-band spacecraft uplink data. This network shall support data rate of 3 Mbps.

- a. The input to the network shall be IP packets, and the output to the SSCC is required to be in the same format as that provided to the network.
- b. NISN shall provide a 56 kbps out-of-band frame relay cloud for network management and status reporting.
- c. The total service availability of the network shall not be less than 0.9995 percent.
- d. The maximum downtime shall not exceed 2 hours for any single outage.
- e. A NISN Mission Critical Service is required.
- f. The interface shall provide security appropriate for "Space Exploration Information".
- g. The maximum acceptable packet loss is .001 percent.
- h. The one-way data transport delay shall not exceed 100 ms.
- i. The communications service shall be transparent to the SSCC (i.e., the data shall be presented by the communications equipment to the SSCC in the same format as that presented by the WSC to the communication service shall be removed from the data prior to delivery to the SSCC and shall require no

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OPERATIONS REQUIREMENT/OPERATIONS DIRECTIVE (PRD/PSP/OR/OD)  
PROGRAM NUMBER: 30000

SECTION 2300 - COMMAND SYSTEMS

PUBLICATION DATE: 05/31/96 REVISION: 0000 RUN DATE: 04/29/10

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[PRD] DATABASE RECORD: 553541  
ITEM NUMBER: T7GT

additional processing or data handling capabilities  
on the part of the SSCC. The data provided by the WSC  
shall not be altered by the communications service).  
j. Reference MSFC-PLAN-3340, IDEA Development Plan for  
more detailed requirements.

SUPPLIER: GSFC AGENCY: GSFC/450.3 (G - GODDARD SPACE FLIGHT CENTER )  
RESPONDER: ANTHONY WILLIAMS

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 11/17/08

SUPPLIER: JSC AGENCY: JSC/DD (JOHNSON SPACE CENTER )  
RESPONDER: NACAIT

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 11/03/08  
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INTERNATIONAL SPACE STATION ORBITAL VOL-I  
PROGRAM REQUIREMENTS DOCUMENT/PROGRAM SUPPORT PLAN/  
OPERATIONS REQUIREMENT/OPERATIONS DIRECTIVE (PRD/PSP/OR/OD)  
PROGRAM NUMBER: 30000

SECTION 2700 - COMMUNICATION

PUBLICATION DATE: 05/31/96      REVISION: 0000      RUN DATE: 04/29/10

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[PRD] DATABASE RECORD:	544846	REQUIREMENT STATUS:	DELETED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	12/15/99

ITEM NUMBER: T1G

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[PRD] DATABASE RECORD:	544847	REQUIREMENT STATUS:	DELETED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	10/13/99

ITEM NUMBER: T2G

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[PRD] DATABASE RECORD:	544848	REQUIREMENT STATUS:	DELETED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	02/06/02

ITEM NUMBER: HT3G

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[PRD] DATABASE RECORD:	544849	REQUIREMENT STATUS:	APPROVED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	10/29/08

INITIAL DATE:	04/30/98		
ITEM NUMBER:	HT4GK	DATE LAST CHANGED:	11/18/08
SECTION:	2700	TIME LAST CHANGED:	09:29:47

REQUESTER: MSFC      JSC  
TEST CODE: CORE

1. DESCRIPTION:      ISS ELEMENT INTEGRATION TEST (EIT) AT KSC-SSPF

- a. The following data services will be transported via the ISS Operational Network(ISSOnet).
- b. A 192 / 24 service from KSC-SSPF to JSC-SSCC shall be provided for the transfer of test S-Band return data. The high and low rates will not be required simultaneously.
- c. A 72 / 18 service from JSC-SSCC to KSC-SSPF shall be provided for the transfer of test S-band forward link data . The high and low data rates will not be required simultaneously.
- d. A 192/24 service from WSC to SSCC shall be provided for the transfer of test S-Band downlink telemetry. The high and low data rates will not be required simultaneously.
- e. A 72/18 service from SSCC to WSC shall be provided for the transfer of test S-Band uplink data. The high and low data rates will not be required simultaneously.
- f. A 192/24 service from WSC to HOSC shall be provided for the transfer of test S-Band downlink telemetry. The high and low data rates will not be required simultaneously.
- g. In support EIT testing, a relay from KSC to TDRS may be

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INTERNATIONAL SPACE STATION ORBITAL VOL-I  
PROGRAM REQUIREMENTS DOCUMENT/PROGRAM SUPPORT PLAN/  
OPERATIONS REQUIREMENT/OPERATIONS DIRECTIVE (PRD/PSP/OR/OD)  
PROGRAM NUMBER: 30000

SECTION 2700 - COMMUNICATION

PUBLICATION DATE: 05/31/96 REVISION: 0000 RUN DATE: 04/29/10

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[PRD] DATABASE RECORD: 544849  
ITEM NUMBER: HT4GK

- required.
- h. The following voice services shall be provided for support of EIT testing.

DESCRIPTION	NUMBER OF CIRCUITS	AVAILABILITY
GSFC to KSC Test Coordination	1 circuit	routine
GSFC to WSC Test Coordination	1 circuit	routine
GSFC to JSC Test Coordination	2 circuits	routine
GSFC to MSFC Test Coordination	1 circuit	routine

SUPPLIER: GSFC AGENCY: GSFC/450.3 (G - GODDARD SPACE FLIGHT CENTER )  
RESPONDER: ANTHONY WILLIAMS

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 11/17/08

SUPPLIER: KSC AGENCY: KSC/PH-B (KENNEDY SPACE CENTER )

SUPPLIER COMMITMENT: NOACK SEE RESPONSE RESPONSE DATE: 10/29/08

RESPONSE: REF: a: Data circuit will be provided using NISN circuit established to support ISS requirements from JSC.  
 REF: b. Data circuit will be provided using NISN circuit established to support ISS requirement JSC.  
 REF: j. This test coord will be assigned by GSFC COMM Manager when needed.  
 REF: Items c,d,e,f,g,h,i, and k are not KSC responsibility.

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 [PRD] DATABASE RECORD: 551182 REQUIREMENT STATUS: DELETED  
 DOCUMENT ID: ISS VOL-I APPROVAL DATE: 01/25/01

ITEM NUMBER: T6GT

INTERNATIONAL SPACE STATION ORBITAL VOL-I  
 PROGRAM REQUIREMENTS DOCUMENT/PROGRAM SUPPORT PLAN/  
 OPERATIONS REQUIREMENT/OPERATIONS DIRECTIVE (PRD/PSP/OR/OD)  
 PROGRAM NUMBER: 30000

SECTION 2710 - AIR/GROUND VOICE COMMUNICATIONS

PUBLICATION DATE: 05/31/96      REVISION: 0000      RUN DATE: 04/29/10

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[PRD] DATABASE RECORD:      533551      REQUIREMENT STATUS: APPROVED
DOCUMENT ID:                ISS VOL-I    APPROVAL DATE:         08/14/07
                                           INITIAL DATE:         08/23/96
ITEM NUMBER:                T1GX      DATE LAST CHANGED:    08/14/07
SECTION:                    2710      TIME LAST CHANGED:    14:42:18

REQUESTER:                  JSC
TEST CODE:                  CORE
    
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1. DESCRIPTION:      VHF VOICE

Communications services shall be provided between SSCC and the VHF ground stations located at Dryden Flight Research Center, White Sand Complex, and Wallops Flight Facility/Tracking Station for the bi-directional transmission of voice. Additionally, a VHF site voice coordination loop interconnecting the control centers, communications facilities, and the VHF ground station is required.

The capability is required to uplink and downlink Space-to-Ground VHF voice communications between the MCC-H, MCC-M, ISS via Dryden Flight Research Center (DFRC), Wallops Flight Facility (WFF), and the White Sands Complex (WSC) ground stations as scheduled.

The Service Module (SM) VHF-1 voice/packet data downlink frequency is 143.625Mhz and the uplink frequency is 139.208Mhz. The modulation is FM with a deviation of plus or minus 10 kHz. Support passes will be scheduled on request.

In addition to normal uplink/downlink support of (SM) VHF-1, the sites are required to provide downlink receive capability on Soyuz-TM VHF-2 at a frequency of 121.750 MHz. Uplink capability on VHF-2 at a frequency of 130.167 MHz is for emergency use only.

VHF 1 and VHF 2 support at DFRC, WFF, and WSC will be on a 4 hour call up and scheduled in case of Soyuz or ISS spacecraft emergency. Operator proficiency passes will be scheduled as needed (approximately 6 passes per year per site). VHF 2 support will be scheduled after each Soyuz launch, two Soyuz launches are projected per year. Approximately 6 passes per launch will be scheduled as follows: 3 at WLPS, 2 at WSC, and 1 at DFRC.

All view period support from Wallops, White Sands and Dryden on ISS VHF 1 and Soyuz VHF 2 is required during any Soyuz or ISS spacecraft emergency for the duration of ISS operations.

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INTERNATIONAL SPACE STATION ORBITAL VOL-I  
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OPERATIONS REQUIREMENT/OPERATIONS DIRECTIVE (PRD/PSP/OR/OD)  
PROGRAM NUMBER: 30000

SECTION 2710 - AIR/GROUND VOICE COMMUNICATIONS

PUBLICATION DATE: 05/31/96 REVISION: 0000 RUN DATE: 04/29/10

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[PRD] DATABASE RECORD: 533551  
ITEM NUMBER: T1GX

NOTE: WSC will support VHF-1 passes that are less than 20 degrees  
elevation on a best effort basis only.

REF: ITEM T9GT SECTION ISO2750 DBR 558566

SUPPLIER: GSFC AGENCY: GSFC/451 (GODDARD SPACE FLIGHT CENTER )  
RESPONDER: ANTHONY WILLIAMS

SUPPLIER COMMITMENT: WILCO SEE RESPONSE RESPONSE DATE: 08/14/07  
RESPONSE: WFF and WSC requires 24 notification. Less than  
24 hours will be scheduled through the WFF shift  
supervisor at (804 824-2375) and WSC at (505 527-7157)  
on a best effort basis.

SUPPLIER: DFRC AGENCY: DFRC/XOS (X - DRYDEN FLIGHT RESEARCH CENTER )  
SUBSUPPLIER: FD

SUPPLIER COMMITMENT: WILCO SEE RESPONSE RESPONSE DATE: 08/14/07  
RESPONSE: Dryden will provide VHF voice 5 days a week,  
8 hours a day. Hours of operation will be normal duty  
hours from 0730-1600 PST. Emergency/contingency support  
outside these hours will provide on an 3 hours best  
effort basis.

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[PRD] DATABASE RECORD: 551156 REQUIREMENT STATUS: DELETED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 02/10/00

ITEM NUMBER: T2GX  
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ISO2710.002 PAGE SEQUENCE NUMBER: 40 REF UDS R G/A  
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INTERNATIONAL SPACE STATION ORBITAL VOL-I  
PROGRAM REQUIREMENTS DOCUMENT/PROGRAM SUPPORT PLAN/  
OPERATIONS REQUIREMENT/OPERATIONS DIRECTIVE (PRD/PSP/OR/OD)  
PROGRAM NUMBER: 30000

SECTION 2710 - AIR/GROUND VOICE COMMUNICATIONS

PUBLICATION DATE: 05/31/96 REVISION: 0000 RUN DATE: 04/29/10

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[PRD] DATABASE RECORD:      590137      REQUIREMENT STATUS: APPROVED
DOCUMENT ID:                ISS VOL-I    APPROVAL DATE:         01/31/07
                                           INITIAL DATE:         12/05/06
ITEM NUMBER:                T4GX        DATE LAST CHANGED:    02/05/07
SECTION:                    2710        TIME LAST CHANGED:    10:26:01

REQUESTER:                  JSC
TEST CODE:                  ALPHSE

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1. DESCRIPTION: PRIVATE VHF COMMUNICATIONS

VHF (ISS) audio that has been designated "Private" by the ISS Flight Surgeons, Crew or Program Management, must be protected from release in any form without proper authorization by all program elements involved in the transmission and recording of data and/or voice containing the Private Audio.

The Houston Comm Tech will alert the US VHF Sites (DFRC, WSC, WLPS) and GSFC (as the switching center) of the designated times for the Private Audio event per procedure and the audio tapes will be marked accordingly or not recorded at all. The Site and GSFC will not listen to any monitoring devise for audio transmission. The VHF Site must contact Houston Comm Tech if any tapes containing Private Audio to verify proper authority to playback.

These restrictions only apply to mission data tapes, there is no Private Audio associated with test and other non-mission related tapes.

Point Contact: Houston Comm Tech/281 483-3291 or 3292.

SUPPLIER: GSFC AGENCY: GSFC/450.1 (GODDARD SPACE FLIGHT CENTER )  
RESPONDER: ANTHONY WILLIAMS

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 02/02/07

SUPPLIER: DFRC AGENCY: DFRC/OS (DRYDEN FLIGHT RESEARCH CENTER )  
RESPONDER: JOSEPH D'AGOSTINO

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 02/02/07

INTERNATIONAL SPACE STATION ORBITAL VOL-I  
PROGRAM REQUIREMENTS DOCUMENT/PROGRAM SUPPORT PLAN/  
OPERATIONS REQUIREMENT/OPERATIONS DIRECTIVE (PRD/PSP/OR/OD)  
PROGRAM NUMBER: 30000

SECTION 2730 - VOICE NETWORK TRANSMISSION

PUBLICATION DATE: 05/31/96 REVISION: 0000 RUN DATE: 04/29/10

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[PRD] DATABASE RECORD: 533567 REQUIREMENT STATUS: APPROVED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 09/20/07  
INITIAL DATE: 08/23/96  
ITEM NUMBER: TIGHT DATE LAST CHANGED: 01/15/09  
SECTION: 2730 TIME LAST CHANGED: 14:40:46  
  
REQUESTER: JSC  
SUBREQUESTER: ZTM  
TEST CODE: CORE

1. DESCRIPTION: VOICE CIRCUITS REQUIREMENT

NISN shall provide voice communications services for voice communications between the SSCC, HOSC, NASA Centers, and the Houston Support Room (HSR MCC-M) for the following locations.

CIRCUITS	DESTINATION	NOTE
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144 CKTS	SSCC to HOSC (Mission, Sim Supt)	(NCHD)
5 CKTS	SSCC to HOSC (PAO support)	(NCHD)
7 CKTS	SSCC to GSFC (Miss, Sim Supt)	(NCHD)
24 CKTS	SSCC to MCC-M (Miss, Sim Supt)	(Critical) 1
24 CKTS	SSCC to MCC-M (Miss, Sim Supt)	(NCHD)

NOTE: 1. During BCC operation, the 24 critical voice loops from SSCC to MCC-M will be routed via HOSC.

SUPPLIER: GSFC AGENCY: GSFC/451 (GODDARD SPACE FLIGHT CENTER )  
RESPONDER: ANTHONY WILLIAMS

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 01/15/09

SUPPLIER: MSFC AGENCY: MSFC/EO60 (MARSHALL SPACE FLIGHT CENTER )  
RESPONDER: MIKE BLUM

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 09/25/07

SUPPLIER: JSC AGENCY: JSC/DD (JOHNSON SPACE CENTER )

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 09/20/07

CLASSIFICATION UNCLASSIFIED

INTERNATIONAL SPACE STATION ORBITAL VOL-I  
PROGRAM REQUIREMENTS DOCUMENT/PROGRAM SUPPORT PLAN/  
OPERATIONS REQUIREMENT/OPERATIONS DIRECTIVE (PRD/PSP/OR/OD)  
PROGRAM NUMBER: 30000

SECTION 2730 - VOICE NETWORK TRANSMISSION

PUBLICATION DATE: 05/31/96 REVISION: 0000 RUN DATE: 04/29/10

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[PRD] DATABASE RECORD: 533567  
ITEM NUMBER: T1GHT

[PRD] DATABASE RECORD: 544850 REQUIREMENT STATUS: DELETED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 10/14/99

ITEM NUMBER: H2G

[PRD] DATABASE RECORD: 558718 REQUIREMENT STATUS: DELETED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 01/30/03

ITEM NUMBER: T3GH

[PRD] DATABASE RECORD: 558719 REQUIREMENT STATUS: DELETED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 01/30/03

ITEM NUMBER: T4GH

[PRD] DATABASE RECORD: 579598 REQUIREMENT STATUS: APPROVED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 01/18/05  
INITIAL DATE:

ITEM NUMBER: T5EG DATE LAST CHANGED: 03/07/08  
SECTION: 2730 TIME LAST CHANGED: 11:22:16

REQUESTER: JSC  
TEST CODE: CORE ISS JSC/DM

1. DESCRIPTION: ALTERNATE SPACE CONTROL VOICE CIRCUIT

NISN is to provide one (1) full duplex, 4 wire voice circuit with  
Type one (1) E&M signaling between the JSC MCC and the Vandenberg  
AFB Alternate Space Control Center in Dahlgren, Va.

REF: Item T32G Section FLT 2730 DBR 544753

SUPPLIER: ER AGENCY: 1 ROPS/DOU (45TH SPACE WING )  
RESPONDER: DAVID P. BURCH

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 06/27/05

SUPPLIER: GSFC AGENCY: GSFC/451 (GODDARD SPACE FLIGHT CENTER )

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 04/19/05

CLASSIFICATION UNCLASSIFIED

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SECTION 2730 - VOICE NETWORK TRANSMISSION

PUBLICATION DATE: 05/31/96 REVISION: 0000 RUN DATE: 04/29/10

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[PRD] DATABASE RECORD: 579598  
ITEM NUMBER: T5EG

[PRD] DATABASE RECORD: 596318 REQUIREMENT STATUS: APPROVED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 10/30/08  
INITIAL DATE: 03/18/08  
ITEM NUMBER: T6GHT DATE LAST CHANGED: 11/18/08  
SECTION: 2730 TIME LAST CHANGED: 09:30:31

REQUESTER: JSC  
TEST CODE: BCC CORE

1. DESCRIPTION: BCC-HOSC AND MCC-M-HSR INTERFACE

In the event of BCC/HOSC activation, the following service is required:

- a. A circuit of 256 kbps shall be provided for two simultaneous IVoDS sessions between the HOSC/POIC MCC-M HSR HSG.
- b. A NISN Mission Critical service is required
- c. The interface shall provide security appropriate for "Space Operations Information".

SUPPLIER: GSFC AGENCY: GSFC/450.1 (GODDARD SPACE FLIGHT CENTER )  
RESPONDER: ANTHONY WILLIAMS

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 11/17/08

SUPPLIER: MSFC AGENCY: MSFC/EO60 (MARSHALL SPACE FLIGHT CENTER )  
RESPONDER: MIKE BLUM

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 11/14/08

SUPPLIER: JSC AGENCY: JSC/DD (JOHNSON SPACE CENTER )  
RESPONDER: NACAIT

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 10/30/08

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SECTION 2734 - VIDEO/DATA NETWORK TRANSMISSION

PUBLICATION DATE: 05/31/96 REVISION: 0000 RUN DATE: 04/29/10

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[PRD] DATABASE RECORD:      533557      REQUIREMENT STATUS: APPROVED
DOCUMENT ID:                ISS VOL-I    APPROVAL DATE:         03/27/07
                               INITIAL DATE:         08/23/96
ITEM NUMBER:                T1GT        DATE LAST CHANGED:    11/26/07
SECTION:                    2734        TIME LAST CHANGED:    14:32:20

REQUESTER:                  JSC
TEST CODE:                  CORE

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1. DESCRIPTION: DATA TRANSFER INTERFACE FOR SSCC TO CSA

The SSCC to/from CSA data transfer interface will be located at the CSA gateway at the SSCC. Exact details of the data/voice/video requirements of the interface are documented in the SSCC to CSA Ground Segment ICD (SSP 45004). CSA will provide the communications service for communications between the SSCC and CSA Facilities in St. Hubert. This WAN communications service, utilizing TCP/IP protocol suite, will transport the following data types: Robotic Planning Software (RPS) workstation video and NASA Administrative services.

Requirements for SSCC to CSA data transfer interface are as follows:

- a. A CIR of 384Kbps shall be provided for transfer of Remote Multi-Purpose Support Room (RMPSR) RPS workstation video.
- b. A NISN PIP service is required.
- c. The interface shall provide security appropriate for "Space Operations Information".
- d. Refer to the SSCC to CSA Ground Segment ICD (SSP 45004) for detailed interface requirements.

SUPPLIER: GSFC AGENCY: GSFC/451 (GODDARD SPACE FLIGHT CENTER )  
RESPONDER: ANTHONY WILLIAMS

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 04/10/07  
RESPONSE:

SUPPLIER: JSC AGENCY: JSC/DD (JOHNSON SPACE CENTER )

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 03/27/07

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## SECTION 2734 - VIDEO/DATA NETWORK TRANSMISSION

PUBLICATION DATE: 05/31/96 REVISION: 0000 RUN DATE: 04/29/10

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[PRD] DATABASE RECORD:      533560      REQUIREMENT STATUS: APPROVED
DOCUMENT ID:                ISS VOL-I    APPROVAL DATE:         03/27/07
                                           INITIAL DATE:         08/23/96
ITEM NUMBER:                T3GT        DATE LAST CHANGED:    09/28/07
SECTION:                    2734        TIME LAST CHANGED:    15:53:21

REQUESTER:                  JSC
TEST CODE:                  CORE

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## 1. DESCRIPTION: DATA TRANSFER INTERFACE FOR SSCC TO MCC-M

NISN shall provide a NASA Operational WAN communications service for communications between the SSCC and the MCC-M gateway. This WAN service, utilizing TCP/IP protocol suite, will transport the following data types for both real-time and simulations: Shuttle data, ECS command and telemetry, SM health and status, trajectory data, ISS commands (payload and core), ISS command responses, command history data files, real-time and recorded telemetry, planning data files, file transfers (uplink and downlink), and archived ISS Systems data. Mission data flowing between the MCC-H and MCC-M has been categorized by mission criticality as being either Mission Critical or Mission non-critical. Negotiated agreement with NISN to modify bandwidth and availability requirements for each category is defined below; however reliability and packet loss remain as documented in Appendix A for Mission Critical Services.

Requirements for SSCC to MCC-M data transfer interface are as follows:

- 1.a. A Real-time Mission Critical 320 kbps data interface shall be provided to transport the following data services with a maximum restoral time of less than 15 minutes.
  - Preplanned FGB and SM commands, command responses, spacecraft, downlink, command history, and planning.
    1. Data, uplink, archive and ground-to-ground files.
    2. EIS Realtime commands.
    3. Russian Orbiting Segment (ROS)CCSDS packet telemetry.
    4. Processed Shuttle telemetry.
    5. ISS Systems telemetry.
    6. PPCP and transport messages.
- b. A NISN Real-time Critical Service is required.
- c. The interface shall provide security appropriate for "Space Operations Information".
- d. The one way data transport delay shall not exceed 700 ms.

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[PRD] DATABASE RECORD: 533560  
ITEM NUMBER: T3GT

- e. The maximum acceptable packet loss is .001 percent.
- 2.a. A Mission Non-Critical 640 kbps data interface shall be provided to transport the following data files with a maximum restoral time of less than 3 hours.
  - 1. General File Transfer (planning, trajectory, flight control, security).
  - 2. Houston Support Room (HSR) telemetry.
  - 3. HSR general file exchange.
  - 4. HSR remote administration.
  - 5. HSR remote baseline update.
- b. A NISN Mission Critical Service is required.
- c. The Interface shall provide security appropriate for "Space Operations Information".
- 3. Ref to the SSCC to Roscomos Ground Segment ICD (SSP 50057) for detailed interface requirements.

SUPPLIER: GSFC AGENCY: GSFC/450.3 (G - GODDARD SPACE FLIGHT CENTER )  
RESPONDER: ANTHONY WILLIAMS

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 04/10/07

SUPPLIER: JSC AGENCY: JSC/DD (JOHNSON SPACE CENTER )

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 04/09/07

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[PRD] DATABASE RECORD:	533561	REQUIREMENT STATUS:	APPROVED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	03/27/07
		INITIAL DATE:	08/23/96
ITEM NUMBER:	T4G	DATE LAST CHANGED:	09/28/07
SECTION:	2734	TIME LAST CHANGED:	15:54:48
REQUESTER:	JSC		
TEST CODE:	CORE		

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[PRD] DATABASE RECORD: 533561  
ITEM NUMBER: T4G

## 1. DESCRIPTION: DATA TRANSFER INTERFACE FOR MCC-M TO SSCC

NISN shall provide a NASA Operational WAN communications service for communications between the MCC-M and the SSCC gateway. This WAN service, utilizing TCP/IP protocol suite, will transport the following data types for both realtime and simulations: Shuttle data, ECS command and telemetry, SM health and status, trajectory data, ISS commands (payload and core), ISS command responses, command history data files, realtime and recorded telemetry, planning data files, file transfer (uplink and downlink), and archived ISS Systems data. Mission data flowing between the MCC-M and MCC-H has been categorized by mission criticality as being either Mission Critical or Mission Non-Critical. Negotiated agreement with NISN to modify bandwidth and availability requirements for each category is defined below; however, reliability and packet loss remain as documented in Appendix A for Mission Critical Services.

Requirements for MCC-M to SSCC data transfer interface are as follows:

- 1.a. Real-time Mission Critical 320 kbps data interface shall be provided to transport the following data services with a maximum restoral time of less than 15 minutes:
    1. Shared multi-segment command data.
    2. Command Express reports.
    3. Russian Segment (RS) commands.
    4. Real-time United States On-Orbit Segment (USOS) telemetry.
    5. Transfer of recorded USOS data.
    6. Transfer of uplink, downlink, planning, and ground-to-ground data files.
  - b. A NISN Real-time Critical Service is required.
  - c. The interface shall provide security appropriate for "Space Operation Information".
  - d. The one way data transport delay shall not exceed 700 ms.
  - e. The maximum acceptable packet loss is .001 percent.
- 2.a. A Mission Non-Critical 640 kbps data interface shall be provided to transport the following data files with a maximum restoral time of less than 3 hours.
1. Moscow Support Room (MSR) telemetry.

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[PRD] DATABASE RECORD: 533561  
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- 2. MSR general file exchange.
  - 3. MSR remote administration.
  - 4. MSR remote baseline update.
  - b. A NISN Mission Critical Service is required.
  - c. The interface shall provide security appropriate for "Space Operations Information".
3. Refer to the SSCC to Roscomos Ground Segment ICD (SSP 50057) for detailed interface requirements.

SUPPLIER: GSFC AGENCY: GSFC/450.3 (G - GODDARD SPACE FLIGHT CENTER )  
RESPONDER: ANTHONY WILLIAMS

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 04/10/07

[PRD] DATABASE RECORD: 538278 REQUIREMENT STATUS: DELETED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 03/30/07

ITEM NUMBER: KT5GKT

[PRD] DATABASE RECORD: 544851 REQUIREMENT STATUS: APPROVED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 10/30/08  
INITIAL DATE: 05/01/98  
ITEM NUMBER: HT6GT DATE LAST CHANGED: 11/18/08  
SECTION: 2734 TIME LAST CHANGED: 09:30:59

REQUESTER: MSFC JSC  
TEST CODE: CORE

1. DESCRIPTION: SSCC TO HOSC DATA TRANSFER INTERFACE

NISN shall provide a NASA Operational WAN communications service for communications between the SSCC and the HOSC. This WAN service, utilizing the Transmission Control Protocol/Internet Protocol (TCP/IP) suite of protocols, will transport the following data types: commands (payload and core), command responses, command history data files, planning data files, uplink file transfers, archived ISS Systems data,

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[PRD] DATABASE RECORD: 544851  
ITEM NUMBER: HT6GT

and archive requests. NISN shall provide a serial bit-stream service for the transmission of simulated S-Band downlink telemetry. These data types are identified below as either operational or simulation requirements.

- a. CIR of 112 kbps shall be provided for the transfer of operational and simulated command responses via a dedicated point to point circuit or equivalent dedicated private network.
- b. CIR of 112 kbps shall be provided for the transfer of operational and simulated command history files.
- c. CIR of 192 kbps shall be provided for the transfer of planning data files.
- d. CIR of 150 kbps shall be provided for the transfer of archived ISS Systems data files.
- e. CIR of 192 kbps, synchronous, serial bit-stream data and clock service shall be provided for the transfer of downlink S-band downlink telemetry.
- f. A CIR of 4 kbps shall be provided for the transfer of real-time and simulated IAM antenna.
- g. A CIR of 256Kbps PIP service shall be provided for the transfer of Orbiter Communications Adapter (OCA) data.
- h. A CIR of 256 kbps PIP service shall be provided for connectivity from the JSC Mirror LAN to allow viewing of the ISS crew laptop screens at the POIC.
- i. A NISN Mission Critical Service (for a through f) is required.
- j. The interface shall provide security appropriate for "Space Operations Information" except a, g, and h which are "Space Exploration Information".
- k. The one way data transport delay (for a through f) shall not exceed 100ms.
- l. The maximum acceptable packet loss (for a through f) is .001 percent.
- m. Refer to the SSCC to HOSC ICD (SSP 45001) for detailed interface requirements.

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[PRD] DATABASE RECORD: 544851  
ITEM NUMBER: HT6GT

SUPPLIER: GSFC      AGENCY: GSFC/450.3      (G - GODDARD SPACE FLIGHT CENTER )  
RESPONDER: ANTHONY WILLIAMS      301 805-3459

SUPPLIER COMMITMENT: WILCO      RESPONSE DATE: 11/17/08

SUPPLIER: JSC      AGENCY: JSC/DD      (JOHNSON SPACE CENTER )  
RESPONDER: NACAIT

SUPPLIER COMMITMENT: WILCO      RESPONSE DATE: 10/30/08

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[PRD] DATABASE RECORD: 544853      REQUIREMENT STATUS: APPROVED  
DOCUMENT ID: ISS VOL-I      APPROVAL DATE: 10/30/08  
INITIAL DATE: 05/01/98  
ITEM NUMBER: HT7GH      DATE LAST CHANGED: 11/18/08  
SECTION: 2734      TIME LAST CHANGED: 09:31:39

REQUESTER: MSFC      JSC  
TEST CODE: CORE

1. DESCRIPTION:      HOSC TO SSCC DATA TRANSFER INTERFACE

NISN shall provide a NASA Operational WAN communications service for communications between the HOSC and the SSCC. This WAN service, utilizing the Transmission Control Protocol/Internet Protocol (TCP/IP) suite of protocols, will transport the following data types: commands (payload and core), command responses, command history data files, planning data files, uplink file transfers, archived ISS Systems data, and archive requests. NISN shall provide a serial bit-stream service for the transmission of simulated S-Band downlink telemetry. These data types are identified below as either operational or simulation requirements.

- a. CIR of 112 kbps shall be provided for the transfer of operational and simulated commands via a dedicated point to point circuit or equivalent dedicated private network.
- b. CIR of 300 kbps shall be provided for the transfer of operational and simulated uplink files.
- c. CIR of 192 kbps shall be provided for the transfer of planning data files.

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[PRD] DATABASE RECORD: 544853  
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- d. CIR of 1 kbps shall be provided for the transfer of archive requests.
- e. CIR of 256Kbps PIP service shall be provided for the transfer of Orbiter Communications Adapter (OCA) data.
- f. CIR of 256 kbps PIP service shall be provided for the POIC crew laptop connectivity to the JSC Mirror LAN.
- g. A NISN Mission Critical Service (for a) is required.
- h. A NISN Mission Non-Critical Service (for b through d)
- i. The one way data transport delay shall not exceed 100 ms (for a through d).
- j. The maximum acceptable packet loss is .001 percent (for a through d).
- k. The interface shall provide security appropriate for "Space Operations Information" except (e and f) which are "Space Exploration Information".
- l. Refer to the SSCC to HOSC ICD (SSP 45001) for detailed interface requirements.

SUPPLIER: GSFC AGENCY: GSFC/450.3 (G - GODDARD SPACE FLIGHT CENTER )  
RESPONDER: ANTHONY WILLIAMS 301 805-3459

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 11/17/08

SUPPLIER: MSFC AGENCY: MSFC/EO60 (MARSHALL SPACE FLIGHT CENTER )  
RESPONDER: MIKE BLUM

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 11/14/08

[PRD] DATABASE RECORD: 544857 REQUIREMENT STATUS: DELETED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 02/14/05

ITEM NUMBER: HT8G

CLASSIFICATION UNCLASSIFIED

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[PRD] DATABASE RECORD:	544866	REQUIREMENT STATUS:	DELETED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	01/30/03

ITEM NUMBER: T9GH

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[PRD] DATABASE RECORD:	544867	REQUIREMENT STATUS:	DELETED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	01/30/03

ITEM NUMBER: T10GH

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[PRD] DATABASE RECORD:	544868	REQUIREMENT STATUS:	DELETED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	01/30/03

ITEM NUMBER: T11GH

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[PRD] DATABASE RECORD:	544869	REQUIREMENT STATUS:	DELETED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	01/30/03

ITEM NUMBER: T12GH

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[PRD] DATABASE RECORD:	544870	REQUIREMENT STATUS:	DELETED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	10/14/99

ITEM NUMBER: T13G

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[PRD] DATABASE RECORD:	544871	REQUIREMENT STATUS:	DELETED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	02/08/02

ITEM NUMBER: T14G

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[PRD] DATABASE RECORD:	544872	REQUIREMENT STATUS:	DELETED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	10/14/99

ITEM NUMBER: T15G

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[PRD] DATABASE RECORD:	544873	REQUIREMENT STATUS:	DELETED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	08/11/00

ITEM NUMBER: T16G

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[PRD] DATABASE RECORD:	545082	REQUIREMENT STATUS:	DELETED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	02/14/05

ITEM NUMBER: HT17G

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[PRD] DATABASE RECORD:	545083	REQUIREMENT STATUS:	DELETED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	02/14/05

ITEM NUMBER: HT18G

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[PRD] DATABASE RECORD:	551157	REQUIREMENT STATUS:	DELETED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	02/10/00

ITEM NUMBER: T19GT

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[PRD] DATABASE RECORD:	551159	REQUIREMENT STATUS:	DELETED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	02/10/00

ITEM NUMBER: T20GT

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[PRD] DATABASE RECORD:	551160	REQUIREMENT STATUS:	DELETED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	02/10/00

ITEM NUMBER: T21GT

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[PRD] DATABASE RECORD:	551214	REQUIREMENT STATUS:	DELETED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	11/04/99

ITEM NUMBER: T22G

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[PRD] DATABASE RECORD:	551215	REQUIREMENT STATUS:	DELETED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	05/07/99

ITEM NUMBER: T23G

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[PRD] DATABASE RECORD:	551219	REQUIREMENT STATUS:	DELETED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	11/05/99

ITEM NUMBER: T24G

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[PRD] DATABASE RECORD:	551224	REQUIREMENT STATUS:	DELETED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	11/05/99

ITEM NUMBER: T25G

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[PRD] DATABASE RECORD:	551225	REQUIREMENT STATUS:	DELETED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	11/05/99

ITEM NUMBER: T26GT

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[PRD] DATABASE RECORD:	551226	REQUIREMENT STATUS:	DELETED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	05/07/99

ITEM NUMBER: T27GT

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[PRD] DATABASE RECORD:	551227	REQUIREMENT STATUS:	DELETED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	11/05/99

ITEM NUMBER: T28GT

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[PRD] DATABASE RECORD:	551228	REQUIREMENT STATUS:	DELETED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	11/05/99

ITEM NUMBER: T29GT

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[PRD] DATABASE RECORD:	551229	REQUIREMENT STATUS:	DELETED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	11/05/99

ITEM NUMBER: T30GT

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[PRD] DATABASE RECORD:	551497	REQUIREMENT STATUS:	DELETED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	02/14/05

ITEM NUMBER: HT31G

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[PRD] DATABASE RECORD:	551498	REQUIREMENT STATUS:	DELETED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	02/14/05

ITEM NUMBER: T32GH

CLASSIFICATION UNCLASSIFIED

INTERNATIONAL SPACE STATION ORBITAL VOL-I  
PROGRAM REQUIREMENTS DOCUMENT/PROGRAM SUPPORT PLAN/  
OPERATIONS REQUIREMENT/OPERATIONS DIRECTIVE (PRD/PSP/OR/OD)  
PROGRAM NUMBER: 30000

SECTION 2734 - VIDEO/DATA NETWORK TRANSMISSION

PUBLICATION DATE: 05/31/96 REVISION: 0000 RUN DATE: 04/29/10

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[PRD] DATABASE RECORD:	551499	REQUIREMENT STATUS:	DELETED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	03/23/00

ITEM NUMBER: T33GT

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[PRD] DATABASE RECORD:	551500	REQUIREMENT STATUS:	DELETED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	03/23/00

ITEM NUMBER: T34GH

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[PRD] DATABASE RECORD:	551501	REQUIREMENT STATUS:	APPROVED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	03/27/07
		INITIAL DATE:	05/05/99
ITEM NUMBER:	KT35GT	DATE LAST CHANGED:	09/28/07
SECTION:	2734	TIME LAST CHANGED:	12:32:13

REQUESTER: KSC JSC  
TEST CODE: CORE

1. DESCRIPTION: JSC TO KSC DATA TRANSFER INTERFACE

NISN shall provide a NASA Operational WAN communications service for communications between the JSC and the KSC. This WAN service, utilizing TCP/IP protocol suite, will transport the following data types: software loads, file transfers.

- a. A CIR of 192 Kbps shall be provided for the transfer of flight software loads from the Software Development Integration Laboratory (SDIL) to the Space Station Processing Facility (SSPF).
- b. A CIR of 224kbps shall be provided for the Test Control and Monitor System (TCMS) from the ASI Gateway at JSC to the SSPF.
- c. The interface shall provide security appropriate for "Space Operations Information".
- e. A NISN Mission Critical Service is required for (a.).
- f. A NISN Premium Service is required for (b.).

REF: ITEM TK5GKT ISO 2734 DBR 538278

SUPPLIER: GSFC AGENCY: GSFC/450.3 (G - GODDARD SPACE FLIGHT CENTER )

INTERNATIONAL SPACE STATION ORBITAL VOL-I  
PROGRAM REQUIREMENTS DOCUMENT/PROGRAM SUPPORT PLAN/  
OPERATIONS REQUIREMENT/OPERATIONS DIRECTIVE (PRD/PSP/OR/OD)  
PROGRAM NUMBER: 30000

SECTION 2734 - VIDEO/DATA NETWORK TRANSMISSION

PUBLICATION DATE: 05/31/96 REVISION: 0000 RUN DATE: 04/29/10

\*\*\*CONTINUED\*\*\*

[PRD] DATABASE RECORD: 551501  
ITEM NUMBER: KT35GT

RESPONDER: ANTHONY WILLIAMS

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 04/10/07  
RESPONSE:

SUPPLIER: JSC AGENCY: JSC/DD (JOHNSON SPACE CENTER )

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 04/09/07

[PRD] DATABASE RECORD: 551502 REQUIREMENT STATUS: APPROVED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 03/27/07  
INITIAL DATE: 05/05/99  
ITEM NUMBER: T36GK DATE LAST CHANGED: 04/11/07  
SECTION: 2734 TIME LAST CHANGED: 10:49:33

REQUESTER: JSC  
TEST CODE: CORE

1. DESCRIPTION: KSC TO JSC DATA TRANSFER INTERFACE

NISN shall provide a NASA Operational WAN communications service for communications between the KSC and the JSC. This WAN service, utilizing TCP/IP protocol suite, will transport the following data types: software loads, file transfer.

- a. A CIR of 192 Kbps shall be provided for the transfer of flight software loads from the SSPF to SDIL.
- b. A CIR of 512kbps shall be provided for the Test Control and Monitor System (TCMS) from the SSPF to the ASI Gateway at JSC.
- c. A CIR of 384kbps shall be provided for compressed video from the SSPF to the ASI Gateway at JSC.
- d. A NISN Mission Critical Service is required for (a.).
- e. A NISN Premium Service is required for (b and c).
- f. The interface shall provide security appropriate for "Space Operations Information".

CLASSIFICATION UNCLASSIFIED

INTERNATIONAL SPACE STATION ORBITAL VOL-I  
PROGRAM REQUIREMENTS DOCUMENT/PROGRAM SUPPORT PLAN/  
OPERATIONS REQUIREMENT/OPERATIONS DIRECTIVE (PRD/PSP/OR/OD)  
PROGRAM NUMBER: 30000

SECTION 2734 - VIDEO/DATA NETWORK TRANSMISSION

PUBLICATION DATE: 05/31/96 REVISION: 0000 RUN DATE: 04/29/10

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[PRD] DATABASE RECORD: 551502  
ITEM NUMBER: T36GK

REF: ITEM TK5GKT ISO2734 DBR 538278

SUPPLIER: GSFC AGENCY: GSFC/450.3 (G - GODDARD SPACE FLIGHT CENTER )  
RESPONDER: ANTHONY WILLIAMS

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 04/10/07  
RESPONSE:

SUPPLIER: KSC AGENCY: KSC/PZ-H-C (K - KENNEDY SPACE CENTER )

SUPPLIER COMMITMENT: NOACK RESPONSE DATE: 03/27/07

[PRD] DATABASE RECORD: 551503 REQUIREMENT STATUS: DELETED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 10/31/08

ITEM NUMBER: T37GT

[PRD] DATABASE RECORD: 551504 REQUIREMENT STATUS: DELETED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 02/14/05

ITEM NUMBER: T38GT

[PRD] DATABASE RECORD: 551505 REQUIREMENT STATUS: DELETED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 11/05/99

ITEM NUMBER: T39GT

[PRD] DATABASE RECORD: 553557 REQUIREMENT STATUS: DELETED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 02/14/05

ITEM NUMBER: T40G

CLASSIFICATION UNCLASSIFIED

INTERNATIONAL SPACE STATION ORBITAL VOL-I  
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OPERATIONS REQUIREMENT/OPERATIONS DIRECTIVE (PRD/PSP/OR/OD)  
PROGRAM NUMBER: 30000

SECTION 2734 - VIDEO/DATA NETWORK TRANSMISSION

PUBLICATION DATE: 05/31/96 REVISION: 0000 RUN DATE: 04/29/10

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[PRD] DATABASE RECORD:	553558	REQUIREMENT STATUS:	DELETED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	02/14/05

ITEM NUMBER: H41GH

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[PRD] DATABASE RECORD:	553759	REQUIREMENT STATUS:	DELETED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	02/14/05

ITEM NUMBER: H42GH

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[PRD] DATABASE RECORD:	556454	REQUIREMENT STATUS:	DELETED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	08/15/00

ITEM NUMBER: T43GT

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[PRD] DATABASE RECORD:	556504	REQUIREMENT STATUS:	APPROVED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	11/10/08

ITEM NUMBER:	T44GT	DATE LAST CHANGED:	11/18/08
SECTION:	2734	TIME LAST CHANGED:	09:32:08

REQUESTER: JSC  
TEST CODE: CORE

1. DESCRIPTION: DSMC INTERFACE

Communications interfaces between the SSCC, the HOSC and the NIC shall be provided. Refer to the Interface Control Document between the Network Control Center Data System and the JSC MCC to SN NCCDS Operational Communications ISC for MCC Systems (JSC-11534, Vol. XVI) for detailed interface requirements.

Scheduling messages for ISS shall simultaneously share the same communications interface as the Shuttle scheduling messages. The SSCC shall supply conflict-free TDRSS scheduling messages for all ISS elements including ACS, ATV, and HTV.

- a. A CIR of 64 kbps between the DSMC and the SSCC shall be provided for TDRSS scheduling messages. This interface shall be full duplex and shall be between the ISS and the SSP Programs.
- b. A NISN Real-time Critical Service is required.
- c. The interface shall provide security appropriate for "Space Operations Information".

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[PRD] DATABASE RECORD: 556504  
ITEM NUMBER: T44GT

- d. Refer to the JSC/GSFC Operational Communications ICD for MCC Systems (JSC 11534, Vol.I, latest revision) for detailed interface specifications.

REF: FLT-I SECTION 2734 DBR 594242

SUPPLIER: GSFC AGENCY: GSFC/450 (GODDARD SPACE FLIGHT CENTER )  
RESPONDER: ANTHONY WILLIAMS 301 805-3459

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 11/17/08

SUPPLIER: JSC AGENCY: JSC/DD (JOHNSON SPACE CENTER )  
RESPONDER: NACAIT

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 11/10/08

[PRD] DATABASE RECORD: 556506 REQUIREMENT STATUS: DELETED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 03/20/01

ITEM NUMBER: T45GH

[PRD] DATABASE RECORD: 556507 REQUIREMENT STATUS: DELETED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 03/20/01

ITEM NUMBER: T47GH

[PRD] DATABASE RECORD: 580379 REQUIREMENT STATUS: APPROVED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 09/18/07  
INITIAL DATE: 02/09/05

ITEM NUMBER: T49EG DATE LAST CHANGED: 10/31/08  
SECTION: 2734 TIME LAST CHANGED: 09:59:18

REQUESTER: JSC  
TEST CODE: CORE STATION

1. DESCRIPTION: ALTERNATE DATA CIRCUIT TO DAHLGREN

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INTERNATIONAL SPACE STATION ORBITAL VOL-I  
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PROGRAM NUMBER: 30000

SECTION 2734 - VIDEO/DATA NETWORK TRANSMISSION

PUBLICATION DATE: 05/31/96 REVISION: 0000 RUN DATE: 04/29/10

\*\*\*CONTINUED\*\*\*

[PRD] DATABASE RECORD: 580379  
ITEM NUMBER: T49EG

DOD will provide a 4.8Kbps Mode 1 direct circuit to receive both classified and unclassified messages from Alternate Space Control Center (ASCC) in Dahlgren, VA to GSFC. These messages will be forwarded to JSC via an already-existing circuit between GSFC and JSC. The messages report on orbital conjunctions, threat and warning, solar flux data, and geomagnetic storm warnings. These messages would be sent from ASCC if, for any reason, Vandenberg, AFB could not send them.

TECHNICAL CONTACT: JSC-DM/ Lack Howorth (TOPO)/ 281 483-2754

REF: ITEM T39EG FLT SECTION 2750 DBR 580378

SUPPLIER: ER AGENCY: 1 ROPS/DOU (45TH SPACE WING )  
RESPONDER: MIKE GAWEL

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 09/28/07

SUPPLIER: GSFC AGENCY: GSFC/451 (GODDARD SPACE FLIGHT CENTER )  
RESPONDER: ANTHONY WILLIAMS

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 09/24/07

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[PRD] DATABASE RECORD: 601017 REQUIREMENT STATUS: APPROVED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 10/30/08  
INITIAL DATE: 10/30/08  
ITEM NUMBER: GT50GHKT DATE LAST CHANGED: 11/18/08  
SECTION: 2734 TIME LAST CHANGED: 09:32:34

REQUESTER: GSFC JSC  
TEST CODE: CORE

1. DESCRIPTION: ISS OPERATIONAL NETWORK (ISSOnet)

ISSOnet (formally known as the FEPR network) is a Layer 3 ISS managed private routed network within the NISN provided Multi Protocol Label Switching (MPLS) Layer 2 infrastructure. Serial Conversion Processors (SCPs), located at WSC and KSC, provide Level-0 processing for the

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INTERNATIONAL SPACE STATION ORBITAL VOL-I  
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SECTION 2734 - VIDEO/DATA NETWORK TRANSMISSION

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[PRD] DATABASE RECORD: 601017  
ITEM NUMBER: GT50GHKT

routing of the data Layer 2 network consists of:

- a. 9 Mbps between JSC/WSGT shall be provided.
- b. 9 Mbps between JSC/STGT shall be provided
- c. 6 Mbps between MSFC/WSGT shall be provided.
- d. 6 Mbps between MSFC/STGT shall be provided.
- e. 1 Mbps between STGT/GSFC shall be provided.
- f. 1 Mbps between WSGT/GSFC shall be provided.
- g. 1 Mbps between KSC/JSC shall be provided.
- h. A NISN Real-time Critical Service is required.
- i. The interface shall provided security appropriate for "Space Operations Information".
- j. The data transport delay shall not exceed 600 ms from center to center. The delay shall not vary.
- k. The maximum bit error rate shall be 10E-6.

The communications service shall be transparent to the WSC. (i.e., the data shall be presented by the communications equipment to the WSC in the same format as that presented by the centers to the communications. Any overhead added by the communications service shall be removed from the data prior to delivery to the WSC and shall require no additional processing or data handling capabilities on the part of the WSC. The data provided by the centers shall not be altered by the communications services).

SUPPLIER: GSFC AGENCY: GSFC/450.1 (GODDARD SPACE FLIGHT CENTER )

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 11/17/08

SUPPLIER: MSFC AGENCY: MSFC/EO60 (MARSHALL SPACE FLIGHT CENTER )

RESPONDER: MIKE BLUM

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 11/14/08

SUPPLIER: KSC AGENCY: KSC/PH-B (KENNEDY SPACE CENTER )

SUPPLIER COMMITMENT: NOACK RESPONSE DATE: 10/30/08

SUPPLIER: JSC AGENCY: JSC/DD (JOHNSON SPACE CENTER )

INTERNATIONAL SPACE STATION ORBITAL VOL-I  
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PROGRAM NUMBER: 30000

SECTION 2734 - VIDEO/DATA NETWORK TRANSMISSION

PUBLICATION DATE: 05/31/96 REVISION: 0000 RUN DATE: 04/29/10

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[PRD] DATABASE RECORD: 601017  
ITEM NUMBER: GT50GHKT

RESPONDER: NACAIT

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 10/30/08

[PRD] DATABASE RECORD: 601037 REQUIREMENT STATUS: APPROVED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 10/31/08  
INITIAL DATE: 10/31/08  
ITEM NUMBER: T51G DATE LAST CHANGED: 11/18/08  
SECTION: 2734 TIME LAST CHANGED: 09:33:14

REQUESTER: JSC  
TEST CODE: BCC CORE

1. DESCRIPTION: MCC-H CONSOLIDATED DEVELOPMENT ENVIRONMENT (CDE)  
AND BCC-HOSC INTERFACE

Reference BCC-HOSC Level B requirements (JSC-63742, latest revision.

- a. A CIR of 10 Mbps shall be provided for SSL-encrypted exceed on demand client server session, system and software maintenance, baseline updates, CM Server synchronization LDAP server synchronization, IPS data base synchronization and FCT data file transfers.
- b. A NISN NTR layer 2 service is required.
- c. A NISN Mission Critical Service is required.
- d. The interface shall provide security appropriate for "Space Exploration Information".

SUPPLIER: GSFC AGENCY: GSFC/450.1 (GODDARD SPACE FLIGHT CENTER )  
RESPONDER: ANTHONY WILLIAMS

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 11/17/08

[PRD] DATABASE RECORD: 601038 REQUIREMENT STATUS: APPROVED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 10/31/08  
INITIAL DATE: 10/31/08  
ITEM NUMBER: HT52G DATE LAST CHANGED: 11/18/08  
SECTION: 2734 TIME LAST CHANGED: 09:34:02

REQUESTER: MSFC JSC

CLASSIFICATION UNCLASSIFIED

INTERNATIONAL SPACE STATION ORBITAL VOL-I  
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PROGRAM NUMBER: 30000

SECTION 2734 - VIDEO/DATA NETWORK TRANSMISSION

PUBLICATION DATE: 05/31/96 REVISION: 0000 RUN DATE: 04/29/10

\*\*\*CONTINUED\*\*\*

[PRD] DATABASE RECORD: 601038  
ITEM NUMBER: HT52G

TEST CODE: BCC

1. DESCRIPTION: BCC-HOSC AND WSC INTERFACE

Reference the BCC-HOSC Level B requirements (JSC-63742, latest revision).

- a. The ISSOnet service is required to provide ISS S-Band forward and return service.
- b. The IDEA interface is required to provide ISS KU-Band forward.

SUPPLIER: GSFC AGENCY: GSFC/450.1 (GODDARD SPACE FLIGHT CENTER )  
RESPONDER: ANTHONY WILLIAMS

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 11/17/08

[PRD] DATABASE RECORD: 601041 REQUIREMENT STATUS: APPROVED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 10/31/08  
INITIAL DATE: 10/31/08  
ITEM NUMBER: HT54G DATE LAST CHANGED: 11/18/08  
SECTION: 2734 TIME LAST CHANGED: 09:34:35

REQUESTER: MSFC JSC  
TEST CODE: BCC CORE

1. DESCRIPTION: BCC-HOSC AND SDIL INTERFACE

Reference the BCC-HOSC Level B requirements (JSC-63742), latest revision.

- a. The ISSOnet service is required to provide S-Band forward and return service to support development testing.

SUPPLIER: GSFC AGENCY: GSFC/450.1 (GODDARD SPACE FLIGHT CENTER )  
RESPONDER: ANTHONY WILLIAMS

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 11/17/08



CLASSIFICATION UNCLASSIFIED

INTERNATIONAL SPACE STATION ORBITAL VOL-I  
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OPERATIONS REQUIREMENT/OPERATIONS DIRECTIVE (PRD/PSP/OR/OD)  
PROGRAM NUMBER: 30000

SECTION 2750 - VOICE TERMINATIONS

PUBLICATION DATE: 05/31/96 REVISION: 0000 RUN DATE: 04/29/10

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[PRD] DATABASE RECORD: 553277 REQUIREMENT STATUS: DELETED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 11/06/00

ITEM NUMBER: T2GT

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[PRD] DATABASE RECORD: 555210 REQUIREMENT STATUS: DELETED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 11/21/00

ITEM NUMBER: KT3GKT

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[PRD] DATABASE RECORD: 556244 REQUIREMENT STATUS: DELETED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 01/30/03

ITEM NUMBER: T4GHT

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[PRD] DATABASE RECORD: 575458 REQUIREMENT STATUS: APPROVED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 02/17/04

ITEM NUMBER: GTY8.1G DATE LAST CHANGED: 02/26/04  
SECTION: 2750 TIME LAST CHANGED: 15:09:34

REQUESTER: GSFC JSC NASA HQ  
TEST CODE: CORE FULL-TIME

1. DESCRIPTION: ISS OPS

RESPONSIBLE AGENCY: GSFC

REF	CAP	TERMINATION LOCATION	NOTE
Y1	M	EXTEND TO HQ	1
G2	M	EXTEND TO GSFC/NIC	
G3	M	EXTEND TO WSC	

NOTE: 1. Voice loop will be extended to the Action Center for HQ ISS staff.

SUPPLIER: GSFC AGENCY: GSFC/451 (GODDARD SPACE FLIGHT CENTER )

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 02/26/04

CLASSIFICATION UNCLASSIFIED

INTERNATIONAL SPACE STATION ORBITAL VOL-I  
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OPERATIONS REQUIREMENT/OPERATIONS DIRECTIVE (PRD/PSP/OR/OD)  
PROGRAM NUMBER: 30000

SECTION 2750 - VOICE TERMINATIONS

PUBLICATION DATE: 05/31/96 REVISION: 0000 RUN DATE: 04/29/10

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[PRD] DATABASE RECORD: 557520 REQUIREMENT STATUS: DELETED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 11/14/02

ITEM NUMBER: T9GT

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[PRD] DATABASE RECORD: 575462 REQUIREMENT STATUS: APPROVED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 02/17/04  
INITIAL DATE:

ITEM NUMBER: GTY10.1G DATE LAST CHANGED: 02/26/04  
SECTION: 2750 TIME LAST CHANGED: 15:09:56

REQUESTER: GSFC JSC NASA HQ  
TEST CODE: CORE FULL-TIME

1. DESCRIPTION: ISS FD

RESPONSIBLY AGENCY: GSFC

REF	CAP	TERMINATION LOCATION	NOTE
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Y1	M	EXTEND TO HQ	1
G2	M	EXTEND TO GSFC/NIC	
G3	M	EXTEND TO WSC	

NOTE 1. Voice loop will be extended to the Action Center for the ISS staff.

SUPPLIER: GSFC AGENCY: GSFC/451 (GODDARD SPACE FLIGHT CENTER )

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 02/26/04

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[PRD] DATABASE RECORD: 575464 REQUIREMENT STATUS: APPROVED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 02/17/04  
INITIAL DATE:

ITEM NUMBER: GTY11.1G DATE LAST CHANGED: 02/26/04  
SECTION: 2750 TIME LAST CHANGED: 15:10:46

REQUESTER: GSFC JSC NASA HQ  
TEST CODE: CORE FULL-TIME

1. DESCRIPTION: PAO MOSCOW

RESPONSIBLE AGENCY: GSFC

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INTERNATIONAL SPACE STATION ORBITAL VOL-I  
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PROGRAM NUMBER: 30000

SECTION 2750 - VOICE TERMINATIONS

PUBLICATION DATE: 05/31/96 REVISION: 0000 RUN DATE: 04/29/10

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[PRD] DATABASE RECORD: 575464  
ITEM NUMBER: GTY11.1G

REF	CAP	TERMINATION LOCATION	NOTE
Y1	T/M	EXTEND TO HQ	1
G2	M	EXTEND TO GSFC/NIC	

NOTE: 1. Voice loop will be extended to the Action Center for the ISS staff.

SUPPLIER: GSFC AGENCY: GSFC/451 (GODDARD SPACE FLIGHT CENTER )

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 02/26/04

[PRD] DATABASE RECORD: 575466 REQUIREMENT STATUS: APPROVED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 02/17/04  
INITIAL DATE:  
ITEM NUMBER: GTY12.1G DATE LAST CHANGED: 02/26/04  
SECTION: 2750 TIME LAST CHANGED: 15:11:09

REQUESTER: GSFC JSC NASA HQ  
TEST CODE: CORE FULL-TIME

1. DESCRIPTION: ISSP MANAGEMENT COORD

RESPONSIBLE AGENCY: GSFC

REF	CAP	TERMINATION LOCATION	NOTE
Y1	T/M	EXTEND TO HQ	1

NOTE: 1. Voice loop will be extended to the Action Center for the ISS staff.

SUPPLIER: GSFC AGENCY: GSFC/451 (GODDARD SPACE FLIGHT CENTER )

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 02/26/04

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INTERNATIONAL SPACE STATION ORBITAL VOL-I  
PROGRAM REQUIREMENTS DOCUMENT/PROGRAM SUPPORT PLAN/  
OPERATIONS REQUIREMENT/OPERATIONS DIRECTIVE (PRD/PSP/OR/OD)  
PROGRAM NUMBER: 30000

SECTION 2750 - VOICE TERMINATIONS

PUBLICATION DATE: 05/31/96 REVISION: 0000 RUN DATE: 04/29/10

[PRD] DATABASE RECORD: 575467 REQUIREMENT STATUS: APPROVED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 02/17/04  
INITIAL DATE:  
ITEM NUMBER: GHT13G DATE LAST CHANGED: 02/26/04  
SECTION: 2750 TIME LAST CHANGED: 15:11:32  
REQUESTER: GSFC MSFC JSC  
TEST CODE: CORE FULL-TIME

1. DESCRIPTION: ISS TN COORD 1

RESPONSIBLE AGENCY: GSFC

REF	CAP	TERMINATION LOCATION	NOTE
T1	T/M	EXTEND TO JSC	
G2	T/M	EXTEND TO WSC	
G3	T/M	EXTEND TO NIC	
M4	T/M	EXTEND TO MSFC	

SUPPLIER: GSFC AGENCY: GSFC/451 (GODDARD SPACE FLIGHT CENTER )

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 02/26/04

[PRD] DATABASE RECORD: 561754 REQUIREMENT STATUS: APPROVED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 11/14/02  
INITIAL DATE: 02/12/02  
ITEM NUMBER: GHT15G DATE LAST CHANGED: 01/12/06  
SECTION: 2750 TIME LAST CHANGED: 09:59:54  
REQUESTER: GSFC MSFC JSC  
TEST CODE: STSALL

ASSOCIATED DOC: FLT-I

1. DESCRIPTION: NISN COMM COORD

Responsible Agency: GSFC

REF	CAP	NOTE	TERMINATION LOCATION
T1	T/M	1	Extend to JSC
H2	T/M	1	Extend to MSFC
G3	T/M	1	Distribute to GSFC NISN

CLASSIFICATION UNCLASSIFIED

INTERNATIONAL SPACE STATION ORBITAL VOL-I  
PROGRAM REQUIREMENTS DOCUMENT/PROGRAM SUPPORT PLAN/  
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PROGRAM NUMBER: 30000

SECTION 2750 - VOICE TERMINATIONS

PUBLICATION DATE: 05/31/96 REVISION: 0000 RUN DATE: 04/29/10

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[PRD] DATABASE RECORD: 561754  
ITEM NUMBER: GHT15G

internal areas

NOTE 1: Orderwire between JSC OST, GSFC COMM MGR, and MSFC NISN (ENMC) and Russian Services Engineering Group (RSEG) for all NISN related voice data issues.

REF: FLT VOL I: ITEM GHT157G SECTION 2750 DBR 567701

SUPPLIER: GSFC AGENCY: GSFC/450 (GODDARD SPACE FLIGHT CENTER )

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 11/22/02

[PRD] DATABASE RECORD: 575468 REQUIREMENT STATUS: APPROVED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 04/06/04  
INITIAL DATE:  
ITEM NUMBER: TY17.1G DATE LAST CHANGED: 01/12/06  
SECTION: 2750 TIME LAST CHANGED: 14:46:36

REQUESTER: JSC NASA HQ  
TEST CODE: CORE FULL-TIME

1. DESCRIPTION: RS ISS VHF 1

RESPONSIBLE AGENCY: GSFC

REF	CAP	TERMINATION LOCATION	NOTE
T1	T/M	EXTEND TO DFRC	
T2	T/M	EXTEND TO WLP	
T3	T/M	EXTEND TO WSC	
Y4	M	EXTEND TO HQ	1

NOTE: Voice loop will be extended to the Action Center for the ISS staff.

SUPPLIER: GSFC AGENCY: GSFC/451 (GODDARD SPACE FLIGHT CENTER )

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 04/29/04

INTERNATIONAL SPACE STATION ORBITAL VOL-I  
PROGRAM REQUIREMENTS DOCUMENT/PROGRAM SUPPORT PLAN/  
OPERATIONS REQUIREMENT/OPERATIONS DIRECTIVE (PRD/PSP/OR/OD)  
PROGRAM NUMBER: 30000

SECTION 2750 - VOICE TERMINATIONS

PUBLICATION DATE: 05/31/96 REVISION: 0000 RUN DATE: 04/29/10

\*\*\*CONTINUED\*\*\*

[PRD] DATABASE RECORD: 575468  
ITEM NUMBER: TY17.1G

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[PRD] DATABASE RECORD: 575471 REQUIREMENT STATUS: APPROVED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 02/17/04  
INITIAL DATE:  
ITEM NUMBER: T18.1G DATE LAST CHANGED: 01/12/06  
SECTION: 2750 TIME LAST CHANGED: 14:48:18

REQUESTER: JSC  
TEST CODE: CORE FULL-TIME

1. DESCRIPTION: RS ISS VHF 2

RESPONSIBLE AGENCY: GSFC

REF	CAP	TERMINATION LOCATION	NOTE
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T1	T/M	EXTEND TO DFRC	1
T2	T/M	EXTEND TO WLP	1
T3	T/M	EXTEND TO WSC	1

NOTE: 1. Downlink receive capability on Soyuz VHF 2. The uplink capability on VHF 2 is for emergency only.

SUPPLIER: GSFC AGENCY: GSFC/451 (GODDARD SPACE FLIGHT CENTER )

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 02/26/04

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[PRD] DATABASE RECORD: 575474 REQUIREMENT STATUS: APPROVED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 06/24/04  
INITIAL DATE: 06/23/04  
ITEM NUMBER: T19.1G DATE LAST CHANGED: 07/26/04  
SECTION: 2750 TIME LAST CHANGED: 09:28:08

REQUESTER: JSC  
TEST CODE: CORE FULL-TIME

1. DESCRIPTION: ISS SITE COORD

RESPONSIBLE AGENCY: GSFC

REF	CAP	TERMINATION LOCATION	NOTE
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INTERNATIONAL SPACE STATION ORBITAL VOL-I  
PROGRAM REQUIREMENTS DOCUMENT/PROGRAM SUPPORT PLAN/  
OPERATIONS REQUIREMENT/OPERATIONS DIRECTIVE (PRD/PSP/OR/OD)  
PROGRAM NUMBER: 30000

SECTION 2750 - VOICE TERMINATIONS

PUBLICATION DATE: 05/31/96 REVISION: 0000 RUN DATE: 04/29/10

\*\*\*CONTINUED\*\*\*

[PRD] DATABASE RECORD: 575474  
ITEM NUMBER: T19.1G

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T1	T/M	EXTEND TO DRFC	1
T2	T/M	EXTEND TO WLP	1
T3	T/M	EXTEND TO WSC	1
T4	T/M	EXTEND TO MSFC	2

NOTE: 1. ISS SITE COORD is for VHF 1 & 2 support only.  
2. ISS SITE COORD is for VHF 1 support only.

SUPPLIER: GSFC AGENCY: GSFC/451 (GODDARD SPACE FLIGHT CENTER )

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 07/23/04

[PRD] DATABASE RECORD:	558796	REQUIREMENT STATUS:	APPROVED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	02/11/02
		INITIAL DATE:	03/29/01
ITEM NUMBER:	GHT21G	DATE LAST CHANGED:	01/12/06
SECTION:	2750	TIME LAST CHANGED:	14:51:05

REQUESTER:	GSFC	MSFC	JSC
TEST CODE:	CORE	FULL-TIME	

1. DESCRIPTION: WSC PLAYBACK COORD

Responsible Agency: GSFC

REF	CAP	TERMINATION LOCATION	NOTE
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T1	T/M	EXTEND TO JSC	1
H2	T/M	EXTEND TO MSFC	1
G3	T/M	EXTEND TO WSC	1

NOTE 1: This circuit will be used for all Shuttle and Station Playbacks.

REF: FLT VOL-I ITEM GHT158G SECTION 2750 DBR 558795

CLASSIFICATION UNCLASSIFIED

INTERNATIONAL SPACE STATION ORBITAL VOL-I  
PROGRAM REQUIREMENTS DOCUMENT/PROGRAM SUPPORT PLAN/  
OPERATIONS REQUIREMENT/OPERATIONS DIRECTIVE (PRD/PSP/OR/OD)  
PROGRAM NUMBER: 30000

SECTION 2750 - VOICE TERMINATIONS

PUBLICATION DATE: 05/31/96 REVISION: 0000 RUN DATE: 04/29/10

\*\*\*CONTINUED\*\*\*

[PRD] DATABASE RECORD: 558796  
ITEM NUMBER: GHT21G

SUPPLIER: GSFC AGENCY: GSFC/450 (GODDARD SPACE FLIGHT CENTER )

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 10/03/02

[PRD] DATABASE RECORD: 576238 REQUIREMENT STATUS: APPROVED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 04/06/04  
INITIAL DATE:  
ITEM NUMBER: Y22.1G DATE LAST CHANGED: 01/12/06  
SECTION: 2750 TIME LAST CHANGED: 14:54:31

REQUESTER: NASA HQ  
TEST CODE: CORE FULL-TIME

1. DESCRIPTION: 1 S/G 1

RESPONSIBLE AGENCY: GSFC

REF	CAP	TERMINATION LOCATION	NOTE
Y1	M	EXTEND TO HQ	1

NOTE: Voice loop will be extended to the Action Center for the ISS staff.

SUPPLIER: GSFC AGENCY: GSFC/451 (GODDARD SPACE FLIGHT CENTER )

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 04/29/04

[PRD] DATABASE RECORD: 576240 REQUIREMENT STATUS: APPROVED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 04/06/04  
INITIAL DATE:  
ITEM NUMBER: Y23.1G DATE LAST CHANGED: 01/12/06  
SECTION: 2750 TIME LAST CHANGED: 14:59:28

REQUESTER: NASA HQ  
TEST CODE: CORE FULL-TIME

1. DESCRIPTION: 1 S/G 2

CLASSIFICATION UNCLASSIFIED

INTERNATIONAL SPACE STATION ORBITAL VOL-I  
PROGRAM REQUIREMENTS DOCUMENT/PROGRAM SUPPORT PLAN/  
OPERATIONS REQUIREMENT/OPERATIONS DIRECTIVE (PRD/PSP/OR/OD)  
PROGRAM NUMBER: 30000

SECTION 2750 - VOICE TERMINATIONS

PUBLICATION DATE: 05/31/96 REVISION: 0000 RUN DATE: 04/29/10

\*\*\*CONTINUED\*\*\*

[PRD] DATABASE RECORD: 576240  
ITEM NUMBER: Y23.1G

RESPONSIBLE AGENCY: GSFC

REF	CAP	TERMINATION LOCATION	NOTE
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Y1	M	EXTEND TO HQ	1

NOTE: Voice loop will be extended to the Action Center for the ISS staff.

SUPPLIER: GSFC AGENCY: GSFC/451 (GODDARD SPACE FLIGHT CENTER )

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 04/29/04

[PRD] DATABASE RECORD:	576242	REQUIREMENT STATUS:	APPROVED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	04/06/04
		INITIAL DATE:	
ITEM NUMBER:	Y24.1G	DATE LAST CHANGED:	01/12/06
SECTION:	2750	TIME LAST CHANGED:	15:00:30

REQUESTER: NASA HQ  
TEST CODE: CORE FULL-TIME

1. DESCRIPTION: TRANSLATE RUSSIAN TO ENGLISH

RESPONSIBLE AGENCY: GSFC

REF	CAP	TERMINATION LOCATION	NOTE
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Y1	M	EXTEND TO HQ	1

NOTE: Voice loop will be extended to the Action Center for the ISS staff.

SUPPLIER: GSFC AGENCY: GSFC/451 (GODDARD SPACE FLIGHT CENTER )

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 04/29/04

CLASSIFICATION UNCLASSIFIED

INTERNATIONAL SPACE STATION ORBITAL VOL-I  
PROGRAM REQUIREMENTS DOCUMENT/PROGRAM SUPPORT PLAN/  
OPERATIONS REQUIREMENT/OPERATIONS DIRECTIVE (PRD/PSP/OR/OD)  
PROGRAM NUMBER: 30000

SECTION 2750 - VOICE TERMINATIONS

PUBLICATION DATE: 05/31/96 REVISION: 0000 RUN DATE: 04/29/10

[PRD] DATABASE RECORD: 576516 REQUIREMENT STATUS: APPROVED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 06/09/04  
INITIAL DATE:  
ITEM NUMBER: T25.1G DATE LAST CHANGED: 01/12/06  
SECTION: 2750 TIME LAST CHANGED: 15:07:43  
REQUESTER: JSC  
TEST CODE: CORE FULL-TIME

1. DESCRIPTION: IP/GC 1

RESPONSIBLE AGENCY: GSFC

REF	CAP	TERMINATION LOCATION	NOTE
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T1	T/M	EXTEND TO WSC	
T2	T/M	EXTEND TO WPS	
T3	T/M	EXTEND TO DFRC	

SUPPLIER: GSFC AGENCY: GSFC/451 (GODDARD SPACE FLIGHT CENTER )

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 07/23/04

[PRD] DATABASE RECORD: 580477 REQUIREMENT STATUS: APPROVED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 06/17/08  
INITIAL DATE: 02/18/05  
ITEM NUMBER: T26.2GH DATE LAST CHANGED: 06/20/08  
SECTION: 2750 TIME LAST CHANGED: 09:05:43  
REQUESTER: JSC  
TEST CODE: BCC ISS CORE

1. DESCRIPTION: BCC VOICE COMMUNICATION

NAME	CAP	FROM	TO	NOTE
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HOUSTON SUPPORT	T/M	MSFC	GSFC	
TRANS RUS/ENG	T/M	MSFC	GSFC	
ISS OPS	T/M	MSFC	GSFC	
1 S/G 1	T/M	MSFC	GSFC	1, 4
1 S/G 2	T/M	MSFC	GSFC	1, 4
RS ISS VHF 1	T/M	MSFC	GSFC	2

CLASSIFICATION UNCLASSIFIED

INTERNATIONAL SPACE STATION ORBITAL VOL-I  
PROGRAM REQUIREMENTS DOCUMENT/PROGRAM SUPPORT PLAN/  
OPERATIONS REQUIREMENT/OPERATIONS DIRECTIVE (PRD/PSP/OR/OD)  
PROGRAM NUMBER: 30000

SECTION 2750 - VOICE TERMINATIONS

PUBLICATION DATE: 05/31/96 REVISION: 0000 RUN DATE: 04/29/10

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[PRD] DATABASE RECORD: 580477  
ITEM NUMBER: T26.2GH

RS ISS VHF 2	T/M	MSFC	GSFC	3
FMT COORD 1	T/M	MSFC	GSFC	
ISS CMD COORD	T/M	MSFC	GSFC	
ISS TLM COORD	T/M	MSFC	GSFC	
ISS MCC COORD 1	T/M	MSFC	GSFC	
IP/GC 1 MH3	T/M	MSFC	GSFC	
MDM ORDERWIRE	T/M	GSFC	MSFC	
NISN COMM COORD	T/M	GSFC	MSFC	
ISS TN COORD 1	T/M	GSFC	MSFC	
WSC P/B COORD	T/M	GSFC	MSFC	
ISS SITE COORD	T/M	GSFC	MSFC	

- NOTE: 1. S/G 1 & 2 will be configured in talk mode for checkouts. After the checkouts the circuits will be in monitor mode.
2. VHF 1 circuit to be configured for T/M for BCC support only at ISS FD request. GSFC will configure WSC, DFRC, or WLPS when required.
3. VHF 2 circuit to be configured for T/M for Soyuz support only at ISS FD request. GSFC will configure WSC, DFRC, or WLPS when required.
4. S-Band Communications are terminated if JSC shutdown the forward link.

SUPPLIER: GSFC AGENCY: GSFC/451 (GODDARD SPACE FLIGHT CENTER )  
RESPONDER: ANTHONY WILLIAMS/ 301 805-3459

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 06/19/08

SUPPLIER: MSFC AGENCY: MSFC/EO60 (MARSHALL SPACE FLIGHT CENTER )  
RESPONDER: MIKE BLUM

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 06/17/08

[PRD] DATABASE RECORD: 580482	REQUIREMENT STATUS: APPROVED
DOCUMENT ID: ISS VOL-I	APPROVAL DATE: 09/18/07
	INITIAL DATE: 02/18/05
ITEM NUMBER: T28G	DATE LAST CHANGED: 09/24/07
SECTION: 2750	TIME LAST CHANGED: 15:02:17

INTERNATIONAL SPACE STATION ORBITAL VOL-I  
PROGRAM REQUIREMENTS DOCUMENT/PROGRAM SUPPORT PLAN/  
OPERATIONS REQUIREMENT/OPERATIONS DIRECTIVE (PRD/PSP/OR/OD)  
PROGRAM NUMBER: 30000

SECTION 2750 - VOICE TERMINATIONS

PUBLICATION DATE: 05/31/96 REVISION: 0000 RUN DATE: 04/29/10

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[PRD] DATABASE RECORD: 580482  
ITEM NUMBER: T28G

REQUESTER: JSC  
SUBREQUESTER: JSC/DM  
TEST CODE: CORE FULL-TIME

1. DESCRIPTION: NORAD COORD

RESPONSIBLE AGENCY: GSFC

REF	CAP	NOTE	TERMINATION LOCATION
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1	T/M		Extend to JSC
2	T/M	1	Extend to Vandenberg, AFB

NOTE: 1. This circuit is shared with Shuttle.

REF: ITEM T26.1G SECTION FLT 2750 DBR 289250

SUPPLIER: GSFC AGENCY: GSFC/451 (GODDARD SPACE FLIGHT CENTER )  
RESPONDER: ANTHONY WILLIAMS 301 805-3459

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 09/24/07

[PRD] DATABASE RECORD: 580484	REQUIREMENT STATUS: APPROVED
DOCUMENT ID: ISS VOL-I	APPROVAL DATE: 02/18/05
	INITIAL DATE: 02/18/05
ITEM NUMBER: T29G	DATE LAST CHANGED: 01/12/06
SECTION: 2750	TIME LAST CHANGED: 15:10:40

REQUESTER: JSC  
SUBREQUESTER: JSC/DM  
TEST CODE: CORE FULL-TIME

1. DESCRIPTION: NORAD ALTERNATE

RESPONSIBLE AGENCY: GSFC/NISN

REF	CAP	NOTE	TERMINATION LOCATION
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T1	T/M	1	Extend to JSC

CLASSIFICATION UNCLASSIFIED

INTERNATIONAL SPACE STATION ORBITAL VOL-I  
PROGRAM REQUIREMENTS DOCUMENT/PROGRAM SUPPORT PLAN/  
OPERATIONS REQUIREMENT/OPERATIONS DIRECTIVE (PRD/PSP/OR/OD)  
PROGRAM NUMBER: 30000

SECTION 2750 - VOICE TERMINATIONS

PUBLICATION DATE: 05/31/96 REVISION: 0000 RUN DATE: 04/29/10

\*\*\*CONTINUED\*\*\*

[PRD] DATABASE RECORD: 580484  
ITEM NUMBER: T29G

T2 T/M 1 Extend to Space Control  
Center in Dahlgren, Va.

NOTE: 1 Circuit will have Type 1 E&M signaling.

SUPPLIER: GSFC AGENCY: GSFC/451 (GODDARD SPACE FLIGHT CENTER )

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 04/19/05

[PRD] DATABASE RECORD: 587137 REQUIREMENT STATUS: APPROVED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 09/08/09  
INITIAL DATE: 05/17/06  
ITEM NUMBER: T33GHT DATE LAST CHANGED: 09/09/09  
SECTION: 2750 TIME LAST CHANGED: 12:05:33

REQUESTER: JSC  
TEST CODE: CORE LSOS

1. DESCRIPTION: LSOS VOICE CONFIGURATION

CONFIGURATION BETWEEN JSC AND GSFC:

NAME:	CAP:	NOTE	TERMINATION LOCATION
GC/NOM SHOTIME	T/M		GSFC NIC
GSFC COMM MGR/MDM O/W	T/M		GSFC
ISS TN COORD 1	T/M		GSFC
ISS SITE COORD	T/M		GSFC
NISN COMM COORD	T/M		GSFC NIC
NORAD COORD	T/M		VAFB, CA
NORAD ALTERNATE	T/M		DAHLGREN, VA
PRIVATE PHONE PATCH	T/M		GODDARD VOICE
RS ISS VHF 1	T/M	2	GSFC
RS ISS VHF 1	M		GSFC NIC
RS ISS VHF 2	T/M		GSFC
RS ISS VHF 2	M	1	GSFC NIC

NOTE 1. Downlink receive capability on SOYUZ VHF 2. The uplink

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INTERNATIONAL SPACE STATION ORBITAL VOL-I  
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 PROGRAM NUMBER: 30000

SECTION 2750 - VOICE TERMINATIONS

PUBLICATION DATE: 05/31/96      REVISION: 0000      RUN DATE: 04/29/10

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[PRD] DATABASE RECORD: 587137  
 ITEM NUMBER: T33GHT

capability on VHF 2 is for emergency only and at the direction of the ISS FD.

2. During the loss of TDRSS FWD/RTN link and during scheduled VHF 1 support, MSFC has a requirement to uplink on VHF 1 at ISS FD direction, but is kept in monitor till directed.

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CONFIGURATION BETWEEN JSC AND MSFC:

NAME:	CAP:	TERMINATION LOCATION
1S/G 1 (MH19) PTT	T/M	PAYCOM, JAXA, ESA
1S/G 2 (MH20) PTT	T/M	PAYCOM, JAXA, ESA
CATO 1	T/M	JAXA, ESA
EPO COORD 1	T/M	JAXA, ESA
FCR SYS 1	T/M	
FD/POD COORD 1	T/M	ISS FD & MSFC POD ONLY
FMT COORD 1 (MH43)	T/M	JAXA, ESA
HOSC ORDERWIRE	T/M	
IP/GC 1 (MHO3)	T/M	JAXA, ESA
ISS AFD 1 (MH17)	T/M	POC & OC ONLY, JAXA, ESA
ISS FLT DIR 1 (MH22)	T/M	TALK FOF POD ONLY, JAXA, ESA
ISS MCC COORD 1	T/M	IST USE ONLY
ISS OPS	T/M	
ISS SYS COORD 1	T/M	JAXA, ESA
PHALCON COORD 1	T/M	JAXA, ESA
POD 1	T/M	SSCC, JAXA, ESA
TRANS RUS/ENG (MH12)	M	JAXA, ESA
XCOM 1	T/M	SSCC POIC PAYCOM, JAXA, ESA
RS ISS VHF 1	T/M	JAXA, ESA
S/T PLN COORD 1	T/M	JAXA, ESA
SURGEON R/T 1	T/M	ESA ONLY
THOR CALL 1	T/M	JAXA, ESA

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INTERNATIONAL SPACE STATION ORBITAL VOL-I  
PROGRAM REQUIREMENTS DOCUMENT/PROGRAM SUPPORT PLAN/  
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SECTION 2750 - VOICE TERMINATIONS

PUBLICATION DATE: 05/31/96 REVISION: 0000 RUN DATE: 04/29/10

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[PRD] DATABASE RECORD: 587137  
ITEM NUMBER: T33GHT

CONFIGURATION BETWEEN JSC AND JAXA

NAME	CAP	TERMINATION LOCATION
JFD 1	T/M	

CONFIGURATION BETWEEN JSC AND ESA

NAME	CAP	TERMINATION LOCATION
FD ISS/COL COORD	T/M	COL-CC

CONFIGURATION BETWEEN JSC AND CSA:

NAME:	CAP:	TERMINATION LOCATION
1S/G 1 (MH19)	M	
1S/G 2 (MH20)	M	
IP/GC 1	T/M	GSS
ISS AFD 1 (MH17)	T/M	RMPSR
ISS FLT DIR 1 (MH22)	T/M	RMPSR
ROBO 1	T/M	RMPSR
ROBO COORD 1	T/M	RMPSR & OEC
ROBO SYS1	T/M	RMPSR & OEC

CONFIGURATION BETWEEN JSC/MCC-H AND Roscomos/MCC-M:

NAME:	CAP:	TERMINATION LOCATION
1S/G 1 (MH19) PTT	T/M	

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INTERNATIONAL SPACE STATION ORBITAL VOL-I  
 PROGRAM REQUIREMENTS DOCUMENT/PROGRAM SUPPORT PLAN/  
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 PROGRAM NUMBER: 30000

SECTION 2750 - VOICE TERMINATIONS

PUBLICATION DATE: 05/31/96 REVISION: 0000 RUN DATE: 04/29/10

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[PRD] DATABASE RECORD: 587137  
 ITEM NUMBER: T33GHT

1S/G 2 (MH20) PTT	T/M
HOUSTON SUPPORT (MH08)	T/M
IP/GC 1 (MH03)	T/M
ISS AFD 1 (MH17)	T/M
ISS CMD COORD (MH40)	T/M
ISS FLT DIR 1 (MH22)	T/M
ISS IST (MH33)	T/M
ISS OPS (MH18)	T/M
ISS SYS COORD 1 (MH27)	T/M
ISS TLM COORD (MH16)	T/M
RS ISS VHF 1 (MH21)	T/M
RS ISS VHF 2 (MH24)	T/M
S/T PLAN COORD 1 (MH26)	T/M
TCOM 1 (MH02)	T/M
TRANS ENG/RUS (MH01)	M
TRANS RUS/ENG (MH12)	M

CONFIGURATION BETWEEN GSFC AND MSFC, WLP, DFRC, WSC, HQ:

NAME:	CAPE	NOTE	TERMINATION LOCATION
GC/NOM SHOTIME	T/M		WSC
GSFC COMM MGR/MDM O/W	T/M		MSFC, WSC
ISS TN COORD 1	T/M		WSC, MSFC, JSC
ISS SITE COORD	T/M		MSFC IST, WLP, DFRC, WSC
NISN COMM COORD	T/M		MSFC, JSC
RS ISS VHF 1 (MH21)	T/M		WLP, DFRC, WSC
RS ISS VHF 1 (MH21)	M	2	MSFC, HQ
RS ISS VHF 2 (MH24)	T/M	1	WLP, DFRC, WSC,
RS ISS VHF 2 (MH24)	M		MSFC, HQ

- NOTE 1. Downlink receive capability on SOYUZ VHF 2. The uplink capability on VHF 2 is for emergency only and at the direction of the ISS FD.
2. During the loss of TDRSS FWD/RTN link and during scheduled VHF 1 support, MSFC has a requirement to uplink on VHF 1 at

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INTERNATIONAL SPACE STATION ORBITAL VOL-I  
PROGRAM REQUIREMENTS DOCUMENT/PROGRAM SUPPORT PLAN/  
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PROGRAM NUMBER: 30000

SECTION 2750 - VOICE TERMINATIONS

PUBLICATION DATE: 05/31/96 REVISION: 0000 RUN DATE: 04/29/10

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\*\*\*CONTINUED\*\*\*

[PRD] DATABASE RECORD: 587137  
ITEM NUMBER: T33GHT

ISS FD direction, but is kept in monitor till directed.

SUPPLIER: GSFC AGENCY: GSFC/451 (GODDARD SPACE FLIGHT CENTER )  
RESPONDER: ANTHONY WILLIAMS 301 805-3459

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 09/08/09

SUPPLIER: MSFC AGENCY: MSFC/EO60 (MARSHALL SPACE FLIGHT CENTER )  
RESPONDER: MIKE BLUM 254 544-5102

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 09/08/09

SUPPLIER: JSC AGENCY: JSC/DD (JOHNSON SPACE CENTER )  
RESPONDER: KEN JONES 281 483-7671

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 09/08/09  
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INTERNATIONAL SPACE STATION ORBITAL VOL-I  
PROGRAM REQUIREMENTS DOCUMENT/PROGRAM SUPPORT PLAN/  
OPERATIONS REQUIREMENT/OPERATIONS DIRECTIVE (PRD/PSP/OR/OD)  
PROGRAM NUMBER: 30000

SECTION 2770 - TELEPHONE

PUBLICATION DATE: 05/31/96 REVISION: 0000 RUN DATE: 04/29/10

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[PRD] DATABASE RECORD: 551162 REQUIREMENT STATUS: DELETED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 02/10/00

ITEM NUMBER: T1G  
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CLASSIFICATION UNCLASSIFIED

INTERNATIONAL SPACE STATION ORBITAL VOL-I  
PROGRAM REQUIREMENTS DOCUMENT/PROGRAM SUPPORT PLAN/  
OPERATIONS REQUIREMENT/OPERATIONS DIRECTIVE (PRD/PSP/OR/OD)  
PROGRAM NUMBER: 30000

SECTION 2800 - VIDEO

PUBLICATION DATE: 05/31/96      REVISION: 0000      RUN DATE: 04/29/10

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[PRD] DATABASE RECORD:	533563	REQUIREMENT STATUS:	APPROVED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	02/08/02
		INITIAL DATE:	08/23/96
ITEM NUMBER:	T1GT	DATE LAST CHANGED:	09/28/07
SECTION:	2800	TIME LAST CHANGED:	12:32:12
REQUESTER:	JSC		
TEST CODE:	FLT 1A		

1. DESCRIPTION:      TELEVISION

The ISS operational television is multiplexed into the Ku-band aggregate return link and is transmitted to the SSCC as digital data. Up to four channels may be simultaneously transmitted. The SSCC will convert the digital data to standard National Television Standards Committee (NTSC) signals and corresponding analog voice. JSC will make these television and voice signal available at the JSC located NASA Operational WAN I/F for distribution.

SUPPLIER: GSFC      AGENCY: GSFC/450.3      (G - GODDARD SPACE FLIGHT CENTER      )

SUPPLIER COMMITMENT: WILCO      RESPONSE DATE: 03/14/02

SUPPLIER: JSC      AGENCY: JSC/DD      (JOHNSON SPACE CENTER      )

SUPPLIER COMMITMENT: WILCO      RESPONSE DATE: 02/08/02

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[PRD] DATABASE RECORD:	553803	REQUIREMENT STATUS:	APPROVED
DOCUMENT ID:	ISS VOL-I	APPROVAL DATE:	03/27/07
		INITIAL DATE:	11/09/99
ITEM NUMBER:	TH2GHT	DATE LAST CHANGED:	01/13/09
SECTION:	2800	TIME LAST CHANGED:	13:13:11
REQUESTER:	JSC	MSFC	
TEST CODE:	CORE		

1. DESCRIPTION:      TELEVISION COMMUNICATIONS REQUIREMENTS

NISN is to provide two (2) video channels to the HOSC Annex, CSA Peering Point, GRC TSC, ARC TSC and to the RPI Peering Point. NISN is to encode NTSC video sourced from JSC Building 8, up to 6Mbps per channel. JSC ISD is responsible for delivering NTSC video from JSC Building 8 to the JSC NISN PIP demarcation point. Service restoration for ISD resources is less than 8 hours on weekdays and on-call on weekends. A NISN PIP service is required to the HOSC, ARC TSC and GRC

INTERNATIONAL SPACE STATION ORBITAL VOL-I  
 PROGRAM REQUIREMENTS DOCUMENT/PROGRAM SUPPORT PLAN/  
 OPERATIONS REQUIREMENT/OPERATIONS DIRECTIVE (PRD/PSP/OR/OD)  
 PROGRAM NUMBER: 30000

SECTION 2800 - VIDEO

PUBLICATION DATE: 05/31/96 REVISION: 0000 RUN DATE: 04/29/10

\*\*\*CONTINUED\*\*\*

[PRD] DATABASE RECORD: 553803  
 ITEM NUMBER: TH2GHT

TSC. A NISN SIP service is required to the PRI Peering Point and CSA. CSA and the RPI sites are responsible for the delivery of encoded video from the Peering Point to their facilities. NISN will provide decoding equipment at the HOSC, GRC TSC, ARC TSC, and CSA to deliver NTSC outputs. At the CSA location, Two (2) decoders will be supplied, with a spare to be shipped by NISN in the event of failure. The RPI sites require the video to be delivered in IP format for viewing on a PC. The ISS Orbital PRD Volume II identifies the RPI sites authorized to receive ISS video.

REF: ISS-II SECTION 2800 ITEM H1GT DBR 545778

SUPPLIER: GSFC AGENCY: GSFC/451 (GODDARD SPACE FLIGHT CENTER )  
 RESPONDER: ANTHONY WILLIAMS

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 04/10/07

SUPPLIER: MSFC AGENCY: MSFC/EO60 (MARSHALL SPACE FLIGHT CENTER )

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 03/27/07

SUPPLIER: JSC AGENCY: JSC/DD (JOHNSON SPACE CENTER )

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 04/09/07

[PRD] DATABASE RECORD: 551507 REQUIREMENT STATUS: APPROVED  
 DOCUMENT ID: ISS VOL-I APPROVAL DATE: 03/27/07  
 INITIAL DATE: 05/05/99  
 ITEM NUMBER: T3GT DATE LAST CHANGED: 09/28/07  
 SECTION: 2800 TIME LAST CHANGED: 12:32:13

REQUESTER: JSC  
 TEST CODE: CORE

1. DESCRIPTION: ADMINISTRATIVE VIDEO TO/FROM MCC-M AND MCC-H

Use of the two administrative video streams utilizing Video Over Internet Protocol (VOIP), will be scheduled to support Soyuz and Progress dockings, and other selected scheduled events.

CLASSIFICATION UNCLASSIFIED

INTERNATIONAL SPACE STATION ORBITAL VOL-I  
PROGRAM REQUIREMENTS DOCUMENT/PROGRAM SUPPORT PLAN/  
OPERATIONS REQUIREMENT/OPERATIONS DIRECTIVE (PRD/PSP/OR/OD)  
PROGRAM NUMBER: 30000

SECTION 2800 - VIDEO

PUBLICATION DATE: 05/31/96 REVISION: 0000 RUN DATE: 04/29/10

\*\*\*CONTINUED\*\*\*

[PRD] DATABASE RECORD: 551507  
ITEM NUMBER: T3GT

SUPPLIER: GSFC AGENCY: GSFC/450.3 (G - GODDARD SPACE FLIGHT CENTER )  
RESPONDER: ANTHONY WILLIAMS 301 805-3459

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 04/10/07  
RESPONSE:

SUPPLIER: JSC AGENCY: JSC/DD (JOHNSON SPACE CENTER )

SUPPLIER COMMITMENT: WILCO RESPONSE DATE: 04/09/07

[PRD] DATABASE RECORD: 553811 REQUIREMENT STATUS: DELETED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 02/11/02

ITEM NUMBER: HT4G

[PRD] DATABASE RECORD: 561705 REQUIREMENT STATUS: DELETED  
DOCUMENT ID: ISS VOL-I APPROVAL DATE: 03/30/07

ITEM NUMBER: T5G

THIS REPORT CONTAINS 86 PAGES

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REPORT BY: FORM=06 DOC=ISS VOL-I SPL= G P1030=N