



ISS/Soyuz VHF Support Team

Network Support Group (NSG)

**VHF Ground Station Status
as of 03/28/11**

Kevin Riley/NOM (301-805-3870)

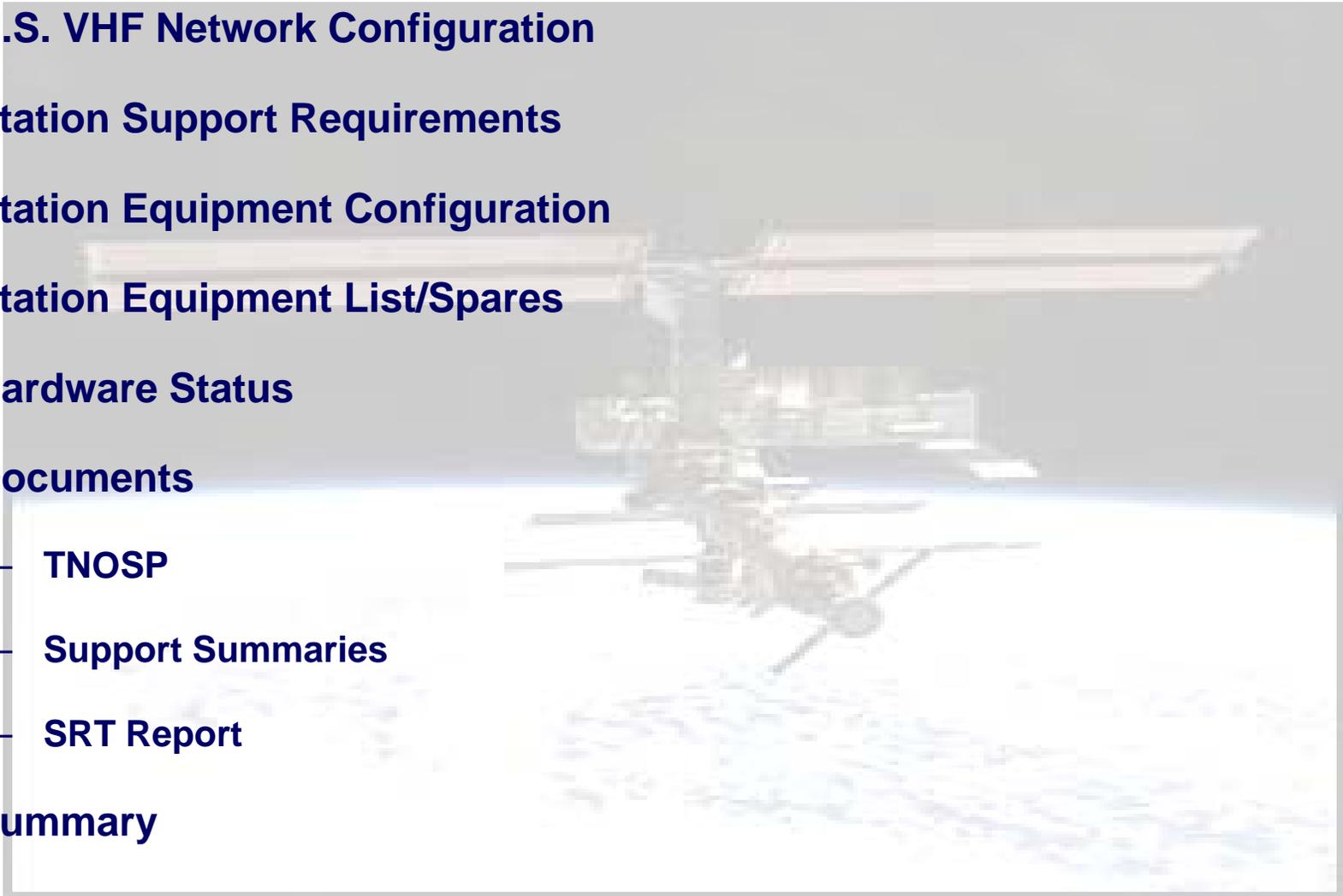
kevin.riley@nasa.gov

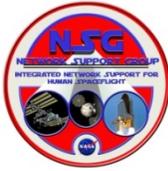


Agenda

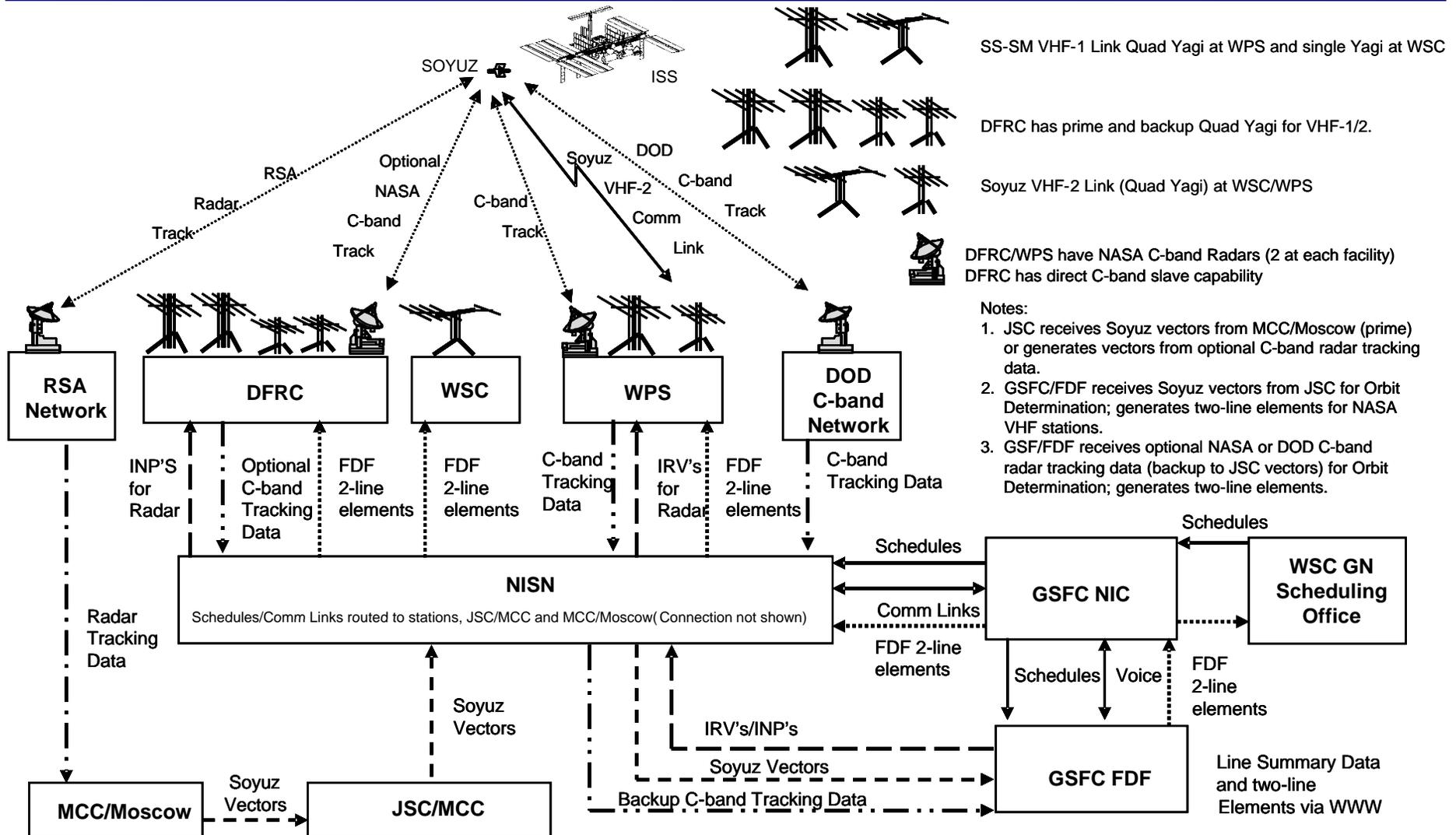


- **U.S. VHF Network Configuration**
- **Station Support Requirements**
- **Station Equipment Configuration**
- **Station Equipment List/Spares**
- **Hardware Status**
- **Documents**
 - **TNOSP**
 - **Support Summaries**
 - **SRT Report**
- **Summary**





Network Configuration



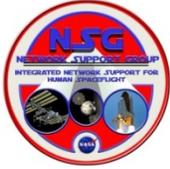


Station Support Requirements



- Present station configuration supports ISS (VHF-1) and Soyuz (VHF-2) and per Program Requirements Document (PRD)
- ISS VHF-1 support @ 139.208 MHz up and 143.625 MHz down
 - Voice support as scheduled (WSC will not be scheduled below 20 degrees)
- Soyuz VHF-2 @ 130.167 MHz up and 121.750 MHz down
 - Voice downlink monitoring/emergency uplink only

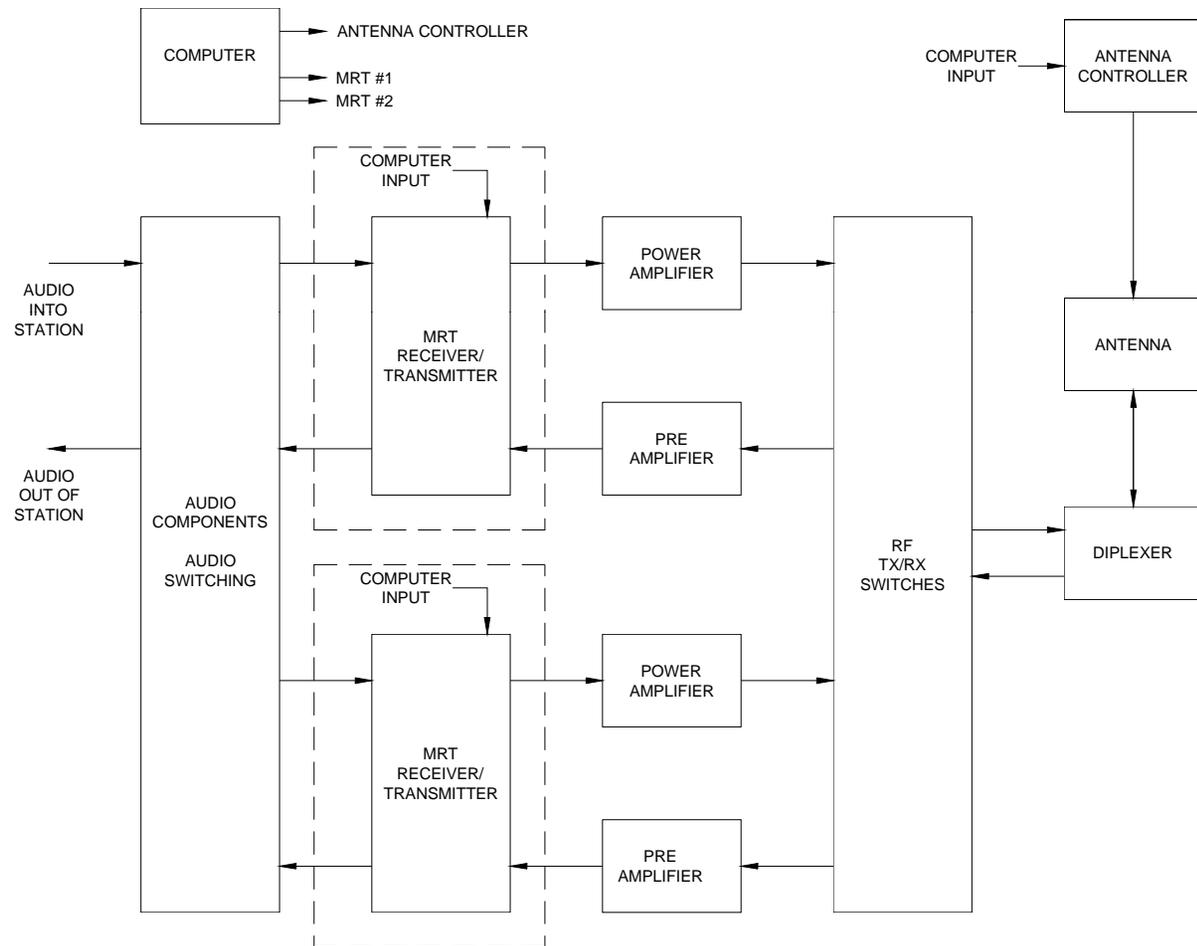


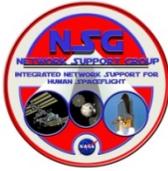


Station Equipment Configurations



WGS/DFRC Single string WSC VHF-2





Station Major Component Equipment List



STATION	ISS VHF-1	Soyuz VHF-2
Dryden Flight Research Center (DFRC)	139.208 MHz Up 143.625 MHz Down Full duplex no doppler compensation	130.167 MHz Up (Emergency only) 121.750 MHz Down Full Duplex with no doppler compensation
	2 Independent systems with real-time selection capability: Prime Antenna: Quad Yagi Prime Transmit and Receive: MRT 1600A Prime Power Amp: TPL PA32LG HMS 500 watts Backup Antenna: Quad Yagi Backup Transmit and Receive: MRT 1600A Backup Power Amp: TPL PA32LG HMS 500 watts Antenna Controller/Nova S/W; C-Band slaving to local radar available Independent computers for prime and backup systems Capability to transmit on one system and receive on 2 nd system to increase sensitivity (Receive Reverse switch)	2 Independent systems with real-time selection capability: Prime Antenna: Quad Yagi Prime Transmit and Receive: MRT 1600A Prime Power Amp: TPL PA32LG HMS 500 watts Backup Antenna: Quad Yagi Backup Transmit and Receive: MRT 1600A Backup Power Amp: TPL PA32LG HMS 500 watts Antenna Controller/Nova S/W; C-Band slaving to local radar available Independent computers for prime and backup systems Capability to transmit on one system and receive on 2 nd system to increase sensitivity (Receive Reverse switch)



Station Major Component Equipment List (cont'd)



STATION	ISS VHF-1	Soyuz VHF-2
<p>Wallops Ground Station (WGS)</p>	<p>139.208 MHz Up 143.625 MHz Down Full duplex with doppler compensation</p> <p>Prime Antenna: Quad Yagi (Single Array; no backup) Dual transmit/receive systems strings with Radio Frequency (RF) switch Prime Transmit and Receive: MRT 1600A Prime Power Amp: TPL PA2CG HMS 350 watts Backup Transmit and Receive: MRT 1600A Backup Power Amp: TPL PA3CG HMS 350 watts 2 Independent computers for prime and backup systems with FODtrack S/W switchable to single Antenna Controller</p>	<p>130.167 MHz Up (Emergency only) 121.750 MHz Down Full Duplex with doppler compensation</p> <p>Prime Antenna: Quad Yagi (Single Array; no backup) Dual transmit/receive systems with Radio Frequency (RF) switch Prime Transmit and Receive: MRT 1600A Prime Power Amp: TPL PA2CG HMS 350 watts Backup Transmit and Receive: MRT 1600A Backup Power Amp: TPL PA3CG HMS 350 watts 2 Independent computers for prime and backup systems with FODtrack S/W switchable to single Antenna Controller</p>



Station Major Component Equipment List (cont'd)



STATION	ISS VHF-1	Soyuz VHF-2
White Sands Complex (WSC)	139.208 MHz Up 143.625 MHz Down Full duplex with doppler compensation Prime Antenna: Single Yagi Transmit and Receive (Single Array; no backup) Dual transmit/receive systems strings with Radio Frequency (RF) switch Prime Transmit and Receive: MRT 1600A Prime Power Amp: TPL 350 watts Backup Transmit and Receive: MRT 1600A Backup Power Amp: TE-1552RAS 350 watts Independent computers for prime and backup systems with FODtrack S/W switchable to single Antenna Controller	130.167 MHz Up (Emergency only) 121.750 MHz Down Full Duplex with doppler compensation Prime Antenna: Quad Yagi (Single Array; no backup) Dual transmit/receive systems with Radio Frequency (RF) switch Prime Transmit and Receive: MRT 1600A Prime Power Amp: TPL PA2CG HMS 350 watts Backup Transmit and Receive: MRT 1600A Backup Power Amp: TPL PA3CG HMS 350 watts 2 Independent computers for prime systems with FODtrack S/W switchable to single Antenna Controller



Hardware Status WPS/WSC



- **Elevation drive motor obsolete**
 - New elevation motor is being evaluated at Goddard Space Flight Center (GSFC)
- **Repair of system is handled locally**
 - MRT modules can be sent to Module Repair Facility at GSFC
- **WGS**
 - VHF-1/2 recording capability installation complete
- **WSC**
 - EC TO015-12 (record capability) is being re-evaluated at WSC (4/29 new date)
 - Evaluating new tower installation at WSC



Documents



- **TDRSS Network Operations Support Plan (TNOSP)**
 - Under going a major rewrite and formatting
 - Specific sections to be address are the pre/post-pass briefing, VHF-2 transmission notification and the updated SRT
- **System equipment manual is being updated**
 - All other equipment manuals are up to date
- **Support Summaries**
 - Station will submit a standardized “VHF Support Summary” per the TNOSP VHF Annex
- **System Readiness Test (SRT)**
 - Stations will perform an SRT (bi-weekly) per the TNOSP VHF Annex (both systems VHF-1/2) and report completion via email to the NOM



Summary



- **The current VHF station configurations comply with the Program Requirements Document (PRD)**
- **A rewrite of the TNOSP VHF Annex is in process**
- **An ISS VHF Support Summary is to be submitted by each station after a VHF Emergency Communications Verification pass or after a series of passes**
- **SRT performed on VHF-1/2 on a bi-weekly bases with completion email report to NOM**

