



MILA/PDL Recent Support Issues

**Wm. Bruce Schneck
GSFC HSF CSR
Network Support Group Meeting
September 19, 2002**



CSOC Ground Network

■ MIL/PDL Best Source Select

- During STS-111 launch, BSS switched to PDL data due to MILA plume attenuation
- DFE reported data drop outs of PDL data
- Frame hits were within BSS tolerance
- MILA manually forced a BSS switch to JDI data
- JDI data was solid through TDRSS handover
- BSS test was conducted on 7/15/02
 - Deadband/Debounce setting tested 3/2, 2/2, 1/2, and 2/1.5
 - The lower the setting the more switching resulted
- Recommend Deadband/Debounce setting for STS-112 at MILA/PDL is 3/2

CSOC Ground Network (cont'd)

■ PDL Compression

- During STS-111 Ascent support, PDL noted an excessively high downlink signal that caused signal compression which appears to have affected the PM and FM data streams
 - The MFR 2 SSME degradation was duplicated at PDL post Ascent with locally generated strong signals
 - It is believed that a strong signal from the Orbiter contributed to the receiver problems
 - Corrective Action taken:
 - Align MFR
 - Add 10db attenuation at down converter input
 - Increase multicoupler gain 10db
- These changes have eliminated the gain compression in both the down converter and multicoupler without affecting OD and SSME telemetry thresholds

CSOC Ground Network (cont'd)

■ MIL/PDL

– PDL 4.3M antenna cable wrap

- Antenna went into a runaway condition on May 8, 2002 just prior to the STS-111 launch
- PDL technicians discovered several problems:
 - MFR-1 Power Supply
 - Polarizer fuse blown
 - ACU control drawer fuse blown
 - Pedestal circuit breaker tripped
 - Nine ripped RF cables
 - Nine ripped control cables
 - Foamflex cable between Azimuth and Elevation rotary joint ripped
 - Waveguide Elbow stressed in elevation compartment

CSOC Ground Network (cont'd)

■ MIL/PDL (cont)

– PDL 4.3M antenna cable wrap (cont)

- PDL technicians discovered several problems (cont)
 - Elevation motor manual brake release cable
 - Antenna Control Unit Servo Control Board failed
 - Secondary Azimuth CW limit switch out-of-alignment
 - Sector limit switch out-of-alignment
- Based on investigation and analysis concluded that a commercial power surge damaged the servo board in the ACU
- The misalignment of the azimuth secondary clockwise and sector limit switches that ultimately allowed the damage by not removing power from the drive motor as designed

CSOC Ground Network (cont'd)

■ MIL/PDL (cont)

– PDL 4.3M antenna cable wrap (cont)

- The root cause has been identified as inadequate maintenance procedures for the antenna**
- Repairs were completed to the antenna on May 18th**
- Re-certification of the antenna was completed on May 24th**
- The antenna was declared fully operational on May 24th**
- successfully supported the launch of STS-111 on June 5th**
- OIRB conducted on June 27, 2002**

CSOC Ground Network (cont'd)

■ MIL/PDL (cont)

– PDL 4.3M antenna cable wrap (cont)

• Corrective Actions

- Antenna Pedestal and ACU power down
- Install single-channel Dranetz Power Monitor
- Update inadequate PMs (5238 & 5748)
- Review LOPs for 9M, UHF and USER antennas – incorporate power down procedures
- Install central UPS with transient suppression and sufficient power for all Ops room equipment
- Purchase a new three-phase power monitor
- Enhance logging software at MILA & PDL
- Investigate design of servo control board
- Repair MILA 4.3M antenna



GSFC Mission Support Center Overview

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Mission Support Center (MSC)

- **The NCC Operations Control Room will now be known as the Mission Control Center (MSC). GSFC Building 13 Room C115.**
- **An Operation Readiness Review (ORR) is planned for mid-November.**
- **Both GSFC Flight Dynamics Facility (FDF) and the Goddard NOMs/ND/SMM/CSR will be occupying the MSC.**

MSC Equipment

- The following equipment will be located in the MSC with FDF:

<u>Equipment</u>	<u>Abbreviation</u>
8 MOSAR/SIMMS Workstations	SIMMS
2 Remote Workstation Dedicated terminals	RWSD
5 Remote Workstation X-terminals	RWSX
1 MILA/BDA Re-engineering single-head terminal	MBR1
1 MILA/BDA Re-engineering dual-head terminal	MBR2
1 Shuttle Antenna Monitoring System keyboard&printer	SAMS
1 Shuttle Air-to-Ground voice setup	A/G
2 WSC TCP/IP Data I/F Service Capability NT terminals	WDISC



MSC Equipment (cont'd)

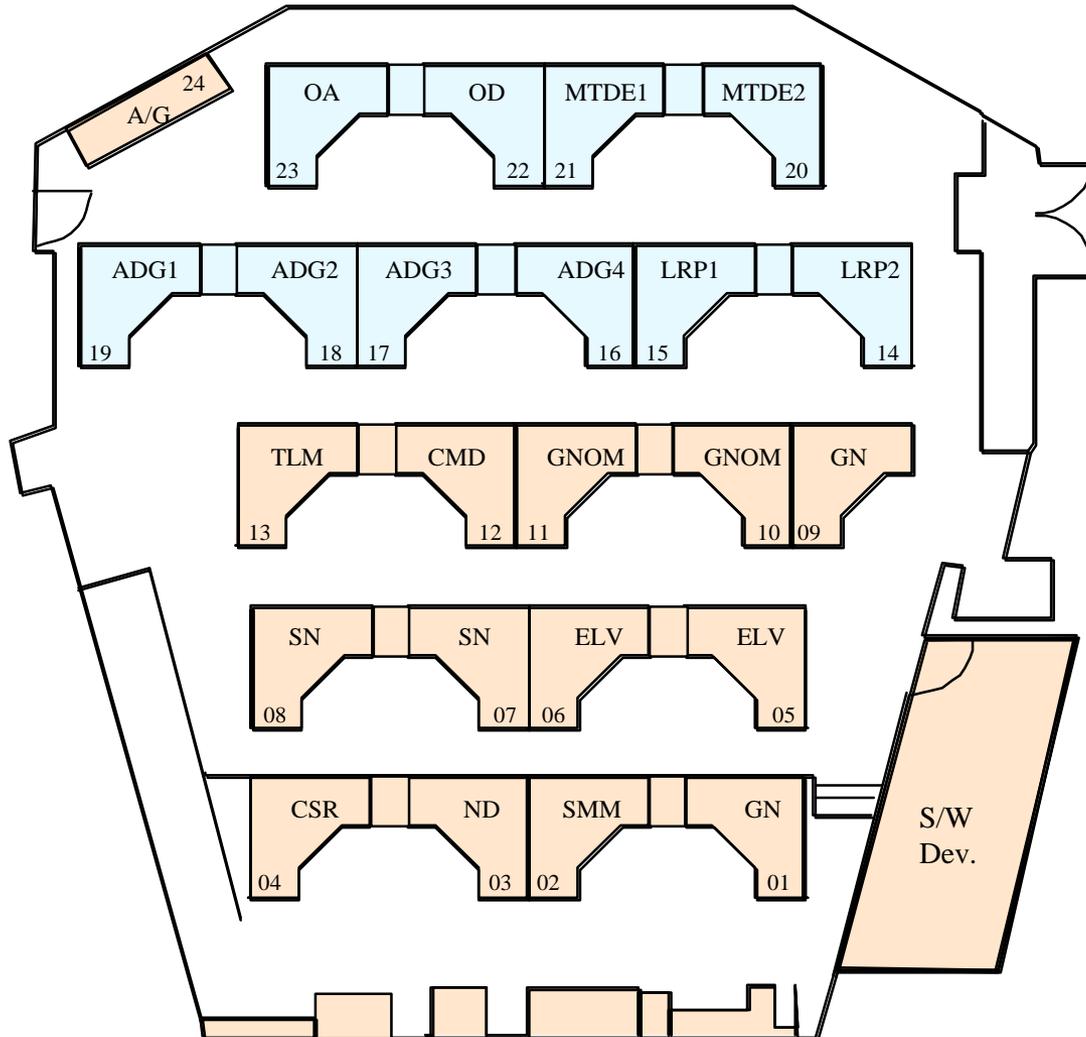
<u>Equipment</u>	<u>Abbreviation</u>
1 WSC TCP/IP Data I/F Service Capability HP terminal	WDISH
1 Space Network Web Services I/F System computer	SWSI
6 Administrative Personal Computers	PC
2 NTDS Remote Terminals	NTDS
1 SAMS video printer	PRTA
1 MBR printer	RPRTB
1 SIMMS printer	PRTI
1 Remote Workstation X-terminal printer	PRTX
1 Multi-Mission Display Processing System computer (MMDPS to be located near a RWSX)	MMDPS



MSC Equipment (cont'd)

<u>Equipment</u>	<u>Abbreviation</u>
19 Closed Circuit Television switches	CCTV
19 Voice Distribution System keysets	VDS
2 Secure phones (STU3 & green)	SPHON
1 Overhead projector	OPROJ
2 Xerox machines	XEROX
2 Fax machines (secure and unsecure)	FAX

FDF and NI Console Positions in the MSC



MSC (cont'd)

- **The SIMMS equipment is currently being tested in the Mission Operations Support Area (MOSA).**
- **Two Space Shuttle missions (STS-110 and 111) have been supported with this equipment. One in a test mode and the other in a parallel mode.**
- **The SIMMS engineers are working closely with the Goddard NOMs in order to ensure that we get the best system possible.**
- **A SIMMS software delivery is expected by end of September 2002 to address some of the concerns by the Goddard NOMs.**