



National Aeronautics and  
Space Administration



GRC-CONN-OPS-0176 Vol 1  
EFFECTIVE DATE: 05/04/2012

## Space Communications and Navigation (SCaN) Testbed Project

National Aeronautics and Space Administration  
John H. Glenn Research Center at Lewis Field, OH 44135

# SCAN TESTBED PROJECT

## SCAN Testbed Console Handbook Volume 1: ISS Interfaces

AUTHORIZED by CM when under FORMAL Configuration Control	
Date	Signature
5/8/12	/s/ Robert E. Turk

**Distribution:**

NASA (U.S. Gov. Only)       Project Only       Government and Contractors

**Availability:**

Public (No Restriction)       Export Controlled       Confidential/ Commercial       Internal Use Only

<b>Space Communications and Navigation (SCaN) Testbed Project</b>		
Title: <b>SCAN Testbed Console Handbook Volume 1 ISS Interfaces</b>	Document No.: <b>GRC-CONN-OPS-0176 Vol 1</b>	Revision: –
	Effective Date: <b>05/04/2012</b>	Page <b>ii</b> of <b>vii</b>

## **PREFACE**

National Aeronautics and Space Administration (NASA) is developing an on-orbit, adaptable, Software Defined Radio (SDR)/Space Telecommunications Radio System (STRS)-based testbed facility to conduct a suite of experiments to advance technologies, reduce risk, and enable future mission capabilities on the International Space Station (ISS). The Space Communications and Navigation (SCaN) Testbed Project will provide NASA, industry, other Government agencies, and academic partners the opportunity to develop and field communications, navigation, and networking technologies in the laboratory and space environment based on reconfigurable, software defined radio platforms and the STRS Architecture. The project was previously known as the Communications, Navigation, and Networking reConfigurable Testbed (CoNNeCT) . Also included are the required support efforts for Mission Integration and Operations, consisting of a ground system and the Glenn Telescience Support Center (GRC TSC). This document has been prepared in accordance with NASA Glenn’s Configuration Management Procedural Requirements GLPR 8040.1 and applies to the SCaN Testbed configuration management activities performed at NASA’s Glenn Research Center (GRC). This document is consistent with the requirements of SSP 41170, Configuration Management Requirements, International Space Station, and GLPR 7120.5.30 Space Assurance Requirements (SAR).

The Mission Operations Plan activities provide the flight and ground operations support efforts for the SCaN Testbed Project flight and ground system. This document provides a handbook for use in supporting console operations of the flight system. It provides the procedures to use the various software applications for commanding, telemetry, and administrative activities.



<b>Space Communications and Navigation (SCaN) Testbed Project</b>		
Title: SCAN Testbed Console Handbook Volume 1 ISS Interfaces	Document No.: GRC-CONN-OPS-0176 Vol 1	Revision: –
	Effective Date: 05/04/2012	Page iv of vii

## SIGNATURE PAGE

***Prepared By:***

*/s/ Helen Brown*

\_\_\_\_\_  
**Helen C. Brown**  
 ZIN Mission Operations  
 ZIN Technologies, Inc.

*5/7/12*

\_\_\_\_\_  
 Date

***Concurred By:***

*/s/ Michael Aulisio*

\_\_\_\_\_  
**Michael Aulisio**  
 ZIN Mission Operations Lead  
 ZIN Technologies, Inc.

*5/7/12*

\_\_\_\_\_  
 Date

***Approved By:***

*/s/ Steven Sinacore*

\_\_\_\_\_  
**Steve Sinacore**  
 SCaN Testbed Mission Operations Lead  
 NASA Glenn Research Center

*5/7/12*

\_\_\_\_\_  
 Date

<b>Space Communications and Navigation (SCaN) Testbed Project</b>		
Title: <b>SCAN Testbed Console Handbook Volume 1 ISS Interfaces</b>	Document No.: <b>GRC-CONN-OPS-0176 Vol 1</b>	Revision: –
	Effective Date: <b>05/04/2012</b>	Page v of vii

## TABLE OF CONTENTS

1.0	INTRODUCTION .....	1
1.1	Purpose.....	1
1.2	Scope.....	1
2.0	APPLICABLE DOCUMENTS .....	2
2.1	Applicable Documents.....	2
2.2	Reference Documents .....	2
2.3	Order of Precedence for Documents.....	2
3.0	CONSOLE ACTIVATION AND SETUP PROCEDURES.....	3
3.1	Voice Loops .....	3
3.2	TReK Workstation Activation .....	5
3.3	Launch the CTADS Application.....	5
3.3.1	Launch the CTADS Command Processing Software .....	8
3.4	Start the EPC Launchpad .....	9
3.4.1	Launch the Command Track Application.....	11
3.4.2	Launch a PRO Display.....	12
3.4.3	Launch the ISS Pointing and RTD Display .....	12
3.5	Start the EHS Web Launchpad .....	13
3.5.1	Start the GSE Packets .....	15
3.5.2	Launch the PIMS Applications.....	18
3.6	IDE Workstation Activation .....	18
3.6.1	Launch the Console Log Application .....	19
4.0	CONSOLE OPERATIONS .....	20
4.1	Commanding.....	20
4.1.1	Description of Commands .....	20
4.1.2	Critical Commands .....	20
4.1.3	Sending a Command .....	21
4.2	Telemetry .....	21
4.2.1	Primary Paths for Telemetry.....	21
4.2.1.1	LRDL (1553) .....	21
4.2.1.2	HRDL (Ethernet) .....	21
4.2.2	APIDs.....	22
4.2.3	Displaying GSE Packets .....	22
4.2.4	Telemetry Caution and Warning Ranges.....	22
4.3	Requesting a NRT Playback .....	23
4.4	File Uplinks/Downlinks .....	24
4.4.1	Uplink/Downlink Using the PLMDM .....	24
4.4.1.1	Preparing a File for Uplink .....	24
4.4.1.2	Submitting a File for Uplink/Downlink.....	28
4.4.1.3	Reassembling a Downlinked File .....	28
4.4.2	Uplink Using Commanding .....	31
4.4.3	Downlink Using Commanding .....	31
4.5	Playback of a TReK Recording .....	31
4.5.1	Instructions for Setting Up TReK Playback .....	31
4.5.2	Instructions for Setting Up CTADS for Playback .....	34
4.5.3	Starting Telemetry Playback in TReK.....	37
4.6	Operational Change Requests (OCRs).....	39

Space Communications and Navigation (SCaN) Testbed Project		
Title: SCAN Testbed Console Handbook Volume 1 ISS Interfaces	Document No.: GRC-CONN-OPS-0176 Vol 1	Revision: –
	Effective Date: 05/04/2012	Page vi of vii

4.6.1	Submitting an OCR.....	39
4.6.2	Printing an OCR.....	45
4.6.3	Reviewing an OCR.....	46
4.7	Payload Anomaly Reports (PARs).....	46
4.7.1	Initiating a PAR.....	46
4.8	Console Log.....	47
4.8.1	Making an Entry.....	47
4.8.2	Filtering the Entries.....	48
4.8.3	Creating a Report.....	49
4.9	Status Reports.....	49
4.9.1	Daily Science Report.....	49
4.9.2	Experiment Scorecard.....	49
4.10	Video.....	49
5.0	SCHEDULING PROCEDURES.....	50
5.1	ISS Scheduling.....	50
5.2	Space Network Scheduling.....	51
5.3	Near Earth Network.....	51
6.0	SHIFT CHANGE PROCEDURES.....	52
6.1	Console Log.....	52
6.2	Debrief Oncoming Shift.....	52
6.2.1	Commander Debrief.....	52
6.2.2	Controller Debrief.....	52
6.2.3	SFEP Operator Debrief.....	52
6.2.4	APS Logistician Debrief.....	52
7.0	CONSOLE DEACTIVATION PROCEDURES.....	53
7.1	Voice Loops.....	53
7.2	Close the CTADS Application.....	53
7.3	Close the CTADS Command Processing Software.....	53
7.4	Close the CTADS Telemetry Processing Software.....	53
7.5	Close the Command Track Application.....	53
7.6	Log Off of the EPC Launchpad.....	54
7.7	Close the PIMS Applications.....	54
7.8	Stop the GSE Packets.....	54
7.9	Log Off of the EHS Web Launchpad.....	55
7.10	Logging Out of the TReK Workstation.....	55
7.11	Close the Console Log Application.....	55
7.12	Logging Out of the IDE Workstation.....	55
8.0	WEB SERVER.....	56
8.1	Flight System Data.....	56
8.2	Experiment Data.....	56
8.2.1	Directory Structure.....	56
8.2.2	Account Control.....	56
8.2.3	Password Reset Procedure.....	57
9.0	CONTACTS.....	59
9.1	SCAN Testbed Team.....	59
9.1.1	Ops Team.....	59
9.1.2	Experiment Integration Team.....	59
9.2	POIC Cadre Team.....	60

<b>Space Communications and Navigation (SCaN) Testbed Project</b>		
Title: SCAN Testbed Console Handbook Volume 1 ISS Interfaces	Document No.: GRC-CONN-OPS-0176 Vol 1	Revision: –
	Effective Date: 05/04/2012	Page vii of vii

9.3	GSFC Communication Team.....	61
10.0	REFERENCE INFORMATION.....	62
10.1	Accounts .....	62
10.2	MOPs and Servers.....	62
10.3	IP Addresses.....	63
10.4	Documents .....	63
10.4.1	Flight System .....	63
10.4.2	POIC .....	63
10.4.3	MOD .....	64
APPENDIX A	ACRONYMS AND ABBREVIATIONS.....	65
A.1	Scope.....	65
A.2	List of Acronyms and Abbreviations.....	65
APPENDIX B	DEFINITIONS .....	67
B.1	Scope.....	67
B.2	List of Definitions .....	67
APPENDIX C	TBDs AND TBRs.....	68
C.1	Scope.....	68
C.2	List of TBDs .....	68
C.3	List of TBRs.....	68

## TABLE OF TABLES

Table 2-1—Applicable Documents .....	2
Table 2-2—Reference Documents.....	2
Table 3-1—Voice Loops.....	3
Table 3-2—GSE Packets .....	17
Table 4-1—Critical Commands .....	20
Table A-1—Acronyms.....	65
Table B-1—Definitions .....	67
Table C-1—TBDs.....	68
Table C-2—TBRs .....	68

Space Communications and Navigation (SCaN) Testbed Project		
Title: SCAN Testbed Console Handbook Volume 1 ISS Interfaces	Document No.: GRC-CONN-OPS-0176 Vol 1	Revision: –
	Effective Date: 05/04/2012	Page 1 of 68

## **1.0 INTRODUCTION**

### **1.1 Purpose**

The document provides a handbook for use in supporting console operations of the SCAN Testbed Flight System. It contains the console procedures and support material for real-time flight operations at the SCaN Testbed Control Center (STCC) in the Telescience Support Center (TSC).

### **1.2 Scope**

The scope of this plan is limited to the console operations for the SCAN Testbed. This document is not intended for the Experiment Teams. It does not cover the procedures and processes used for the SCaN Testbed Experiment Center (STEC) nor the Ground Integration Unit (GIU).

<b>Space Communications and Navigation (SCaN) Testbed Project</b>		
Title: SCAN Testbed Console Handbook Volume 1 ISS Interfaces	Document No.: GRC-CONN-OPS-0176 Vol 1	Revision: –
	Effective Date: 05/04/2012	Page 2 of 68

## 2.0 APPLICABLE DOCUMENTS

This section lists the NASA/Government and non-NASA/Government specifications, standards, guidelines, handbooks, or other special publications applicable to this document.

### 2.1 Applicable Documents

Applicable documents are those documents that form a part of this document. These documents carry the same weight as if they were stated within the body of this document.

**Table 2-1—Applicable Documents**

Document Number	Applicable Document
POIF-1004	Payload Operations Integration Center Payload Operation Handbook Volume 1: Pre/Post-Increment Operations (POIC POH Vol 1)
POIF-1005	Payload Operations Integration Center Payload Operation Handbook Volume 2: Increment Operations (POIC POH Vol 2)
SSP 50205 Volume I & II	POIC to Generic User Interface Definition Document (PGUIDD)
TSC-DOC-016	GRC Telescience Support Center Operations Manual (TOM)

### 2.2 Reference Documents

Reference documents are those documents that, though not a part of this document, serve to clarify the intent and contents of this document.

**Table 2-2—Reference Documents**

Document Number	Reference Document
GRC-CONN-DBK-0128	Command and Telemetry Databook
GRC-CONN-ICD-0067	CCC to TSC Interface Control Document
GRC-CONN-PLAN-0130	Data Management Plan
GRC-CONN-PLAN-0900	SN-NEN Planning Guide
GRC-CONN-RPT-0227	Failure Detection, Isolation, and Recovery (FDIR) Report

### 2.3 Order of Precedence for Documents

In the event of a conflict between this document and other documents specified herein, the requirements of this document shall apply. In the event of a conflict between this document and higher level documents, the higher level documents shall take precedence over this document.

All documents used are to be the approved versions released as of the CoNNeCT Project Plan (GRC-CONN-PLAN-0004) baseline date. All document changes issued after the baseline establishment shall be reviewed for impact on the scope of work. Nothing in this document supersedes applicable laws and regulations unless a specific exemption has been obtained.

### 3.0 CONSOLE ACTIVATION AND SETUP PROCEDURES

Console activation and setup should be performed at the beginning of each new flight operation session. The activations may be performed by either the Commander or the Controller or the tasks may be split between the two.

#### 3.1 Voice Loops

A detailed listing of POIC voice loops can be found in the POH Vol. 2 Section 3.11.

The voice loops that SCAN Testbed should be monitoring are listed in Table 3-1 . The loops that should be continuously monitored are in **bold**.

**Table 3-1—Voice Loops**

<b>Voice Loop Abbreviation</b>	<b>Voice Loop Name</b>	<b>Description</b>
<b>DMC</b>	Data Management Coordinator	Coordinate Ku-band uplink/downlink activities, coordinate ground data and video distribution/quality, and control HRFM.
<b>FMT COORD</b> (JSC loop)	File Memory Transfer (FMT) Coord	File Memory Transfer coordination loop. AOS/LOS and commanding announcements. The PRO announces critical commands on this prior to sending them
GLENN OPS	Glenn Operations	Coordination between the TSC and the TSC payloads
<b>ISS FD</b>	ISS Flight Director	POD interface to HOUSTON FLIGHT/CAPCOM for ISS P/L ops discussions related to go/no-go decisions, ops plan changes, etc.
<b>ISS PTG</b> (JSC loop)	ISS Pointer	Coordination between SCAN Testbed and the ISS Pointers for TDRS windows
KU COORD	Ku Coordination	Coordination between POIC, MCC-H and ISS ground facilities receiving Ku-Band composite downlink for configuration of IDD Ku-Band system and contents.
<b>LIS COORD</b>	Lead Increment Science Coordination	LIS coordination with ESA, JAXA and PDs.

<b>Voice Loop Abbreviation</b>	<b>Voice Loop Name</b>	<b>Description</b>
<b>OC</b>	Operations Controller (OC & PAYCOM)	Monitor P/L ops to ensure OSTP execution, and coordinate resource changes with NASA P/Ls. Also, coordination between PAYCOM and RPI P/L Users for S/G communication issues. POC for R/T P/L safety concerns.
<b>POD</b>	Payload Operations Director	Interface between POD and P/L community. Final authority for R/T PL Ops changes and PL voice uplink approvals. Coordination loop for PAYCOM and POIC Safety.
<b>PRO/PRO2</b>	Payload Rack Officer	Configures/monitors LSE, NASA PLSS, NASA PLSS-to-P/L, and NASA PLSS-to-IP interfaces. Manages EXPRESS operations. Manage PL MDM and timeliner configurations, ensure files are onboard for OSTP execution, and manage command link according to the OSTP.
<b>PSE</b>	Payload Support Engineer	Support resolution of P/L anomalies, performs studies/analysis of events that led to anomalies, and coordinates changes to PSM & Ground Procedures book.
<b>RPI OPS</b>	Remote PI OPS (HOSC OPS)	Coordination loop used for ground support between POIC IST and PDs.
<b>SCAN Testbed (GSFC loop)</b>	SCAN Testbed	Coordination between the TSC, GSFC, and White Sands for SN and NEN events
<b>SCI 3</b>	Science 3	P/L science loops between POIC and assigned PDs
<b>S/G –1</b>	Space to Ground 1	Primary interface for coordination of PL Ops activity with the ISS crew.
<b>S/G –2</b>	Space to Ground 2	Backup interface for coordination of PL Ops activity with the ISS crew.
<b>TCO</b>	Timeline Coordination Officer	Coordination for timeline changes, plan reviews, and payload planning information.

Space Communications and Navigation (SCaN) Testbed Project		
Title: SCAN Testbed Console Handbook Volume 1 ISS Interfaces	Document No.: GRC-CONN-OPS-0176 Vol 1	Revision: –
	Effective Date: 05/04/2012	Page 5 of 68

### 3.2 TReK Workstation Activation

The TReK Workstation is a computer that is on the TSC Mission Network that allows the user to interface with the MSFC EHS systems. It also allows the user a means to display and process telemetry data and to command the flight system. SCAN Testbed has two TReKs for flight operations.

1. Press CTRL+ALT+DELETE to log onto the workstation
2. Enter **connectops** for the Username
3. Enter the password (see [Section 10.1](#))
4. Enter **TSC** for the Domain
5. Select OK

### 3.3 Launch the CTADS Application

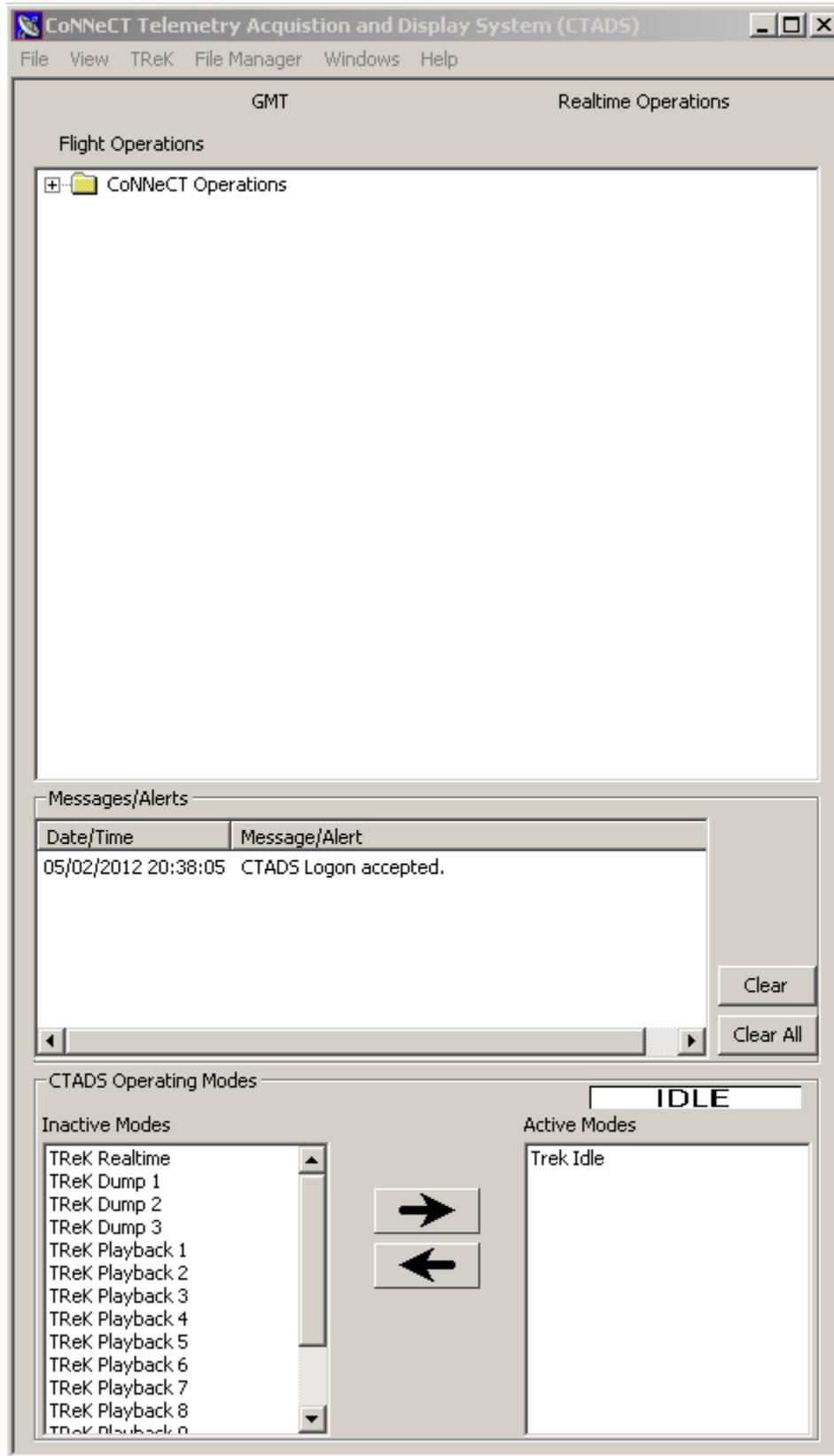
CTADS is an application that runs on the TReK. It has modules for sending commands and receiving telemetry.

1. Select the CTADS icon from the TReK desktop

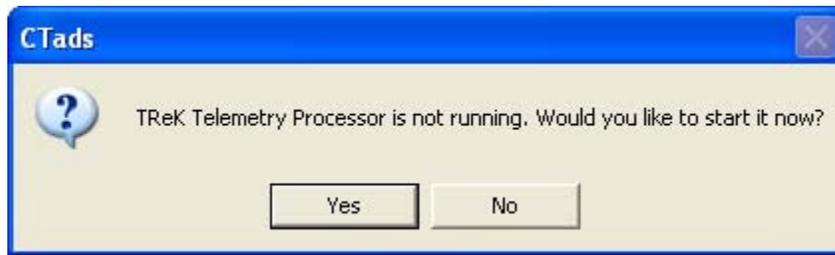


Shortcut to CTads.exe.lnk

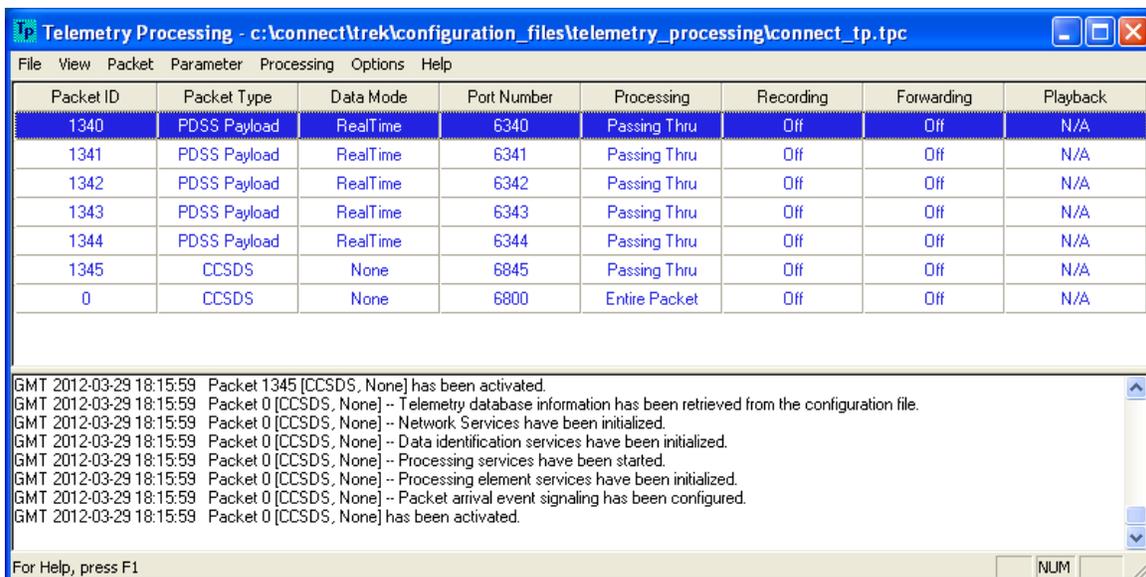
2. The User Name and Password should be prefilled.
  - a. If not enter CoNNeCT for the User Name
  - b. Enter password (see [Section 10.1](#))
3. Verify the configuration file is c:\Connect\Config\CoNNeCTTads.cfg
4. Select TReK Realtime under Inactive Modes (bottom left) and move it to Active Modes.



5. A window will appear asking to start the Telemetry Processor. Select Yes.



6. A TReK config file window will appear. Verify the configuration file is `c:\Connect\trek\configuration_files\telemetry_processing\connect_tp.tpc`. Select OK
7. The Telemetry Processing window will appear. All telemetry data is sent to the CoNNeCT TReK (CONMS) in the TSC server room. CONMS then forwards the data to the TReKs in the TSC. The CTADS software on the SCAN Testbed TReK workstation will be used to receive and display the data.





### 3.4 Start the EPC Launchpad

The EPC Launchpad provides access to the POIC command track functions, the PRO displays and the GSE displays we have built.

1. Select the EPC icon from the TReK desktop

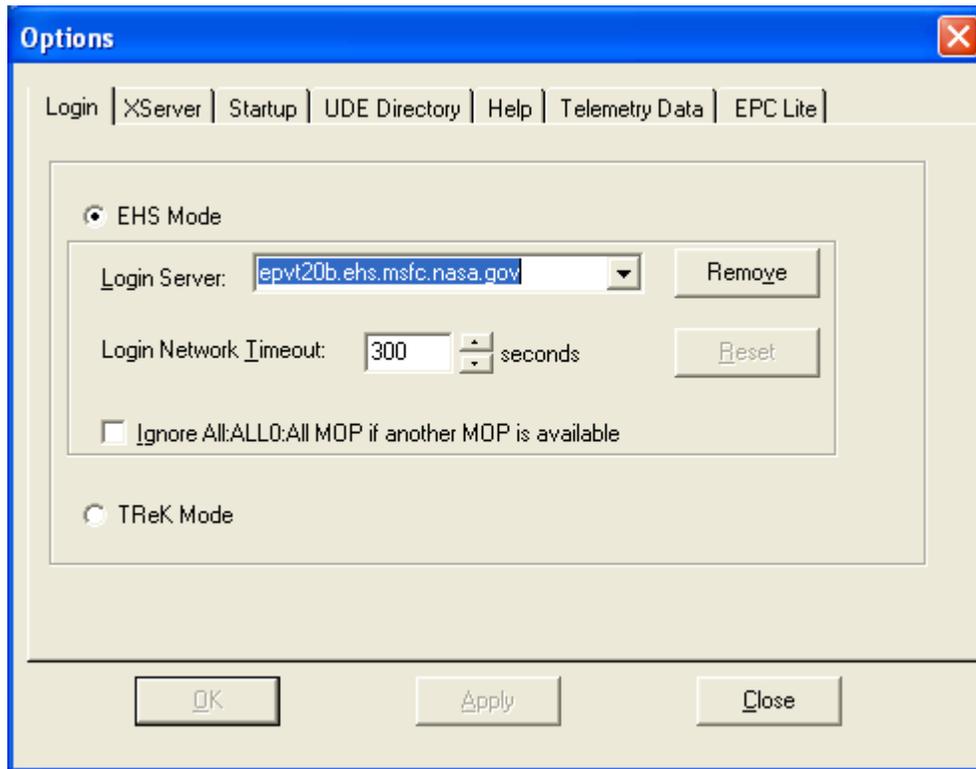


2. Enter scanall0 for the User Name

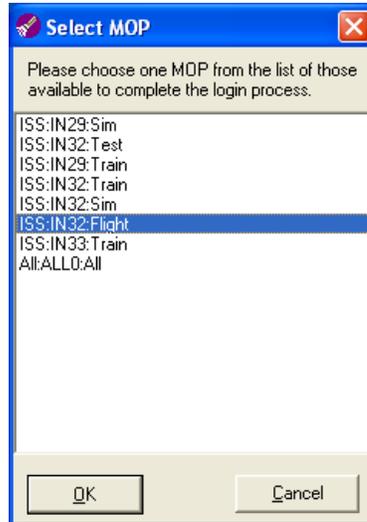
3. Enter the password (see [Section 10.1](#))

Note: Leave Passcode blank.

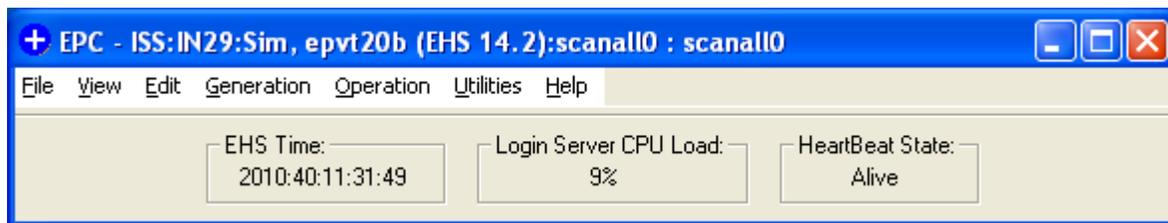
4. Enter the login server listed in [Section 10.2](#). Currently it is epvt20b. If it doesn't match, follow the next steps, otherwise skip to step 9.
5. Select the Options button



6. Add the login server epvt20b
7. Select Apply
8. Select Close
9. Select OK on the EHS EPC Login window



10. Select the appropriate MOP (see [Section 10.2](#))
11. Select OK
12. Wait for the launchpad to appear



Note: A window called Message Viewer will also open. This can be minimized.

### 3.4.1 Launch the Command Track Application

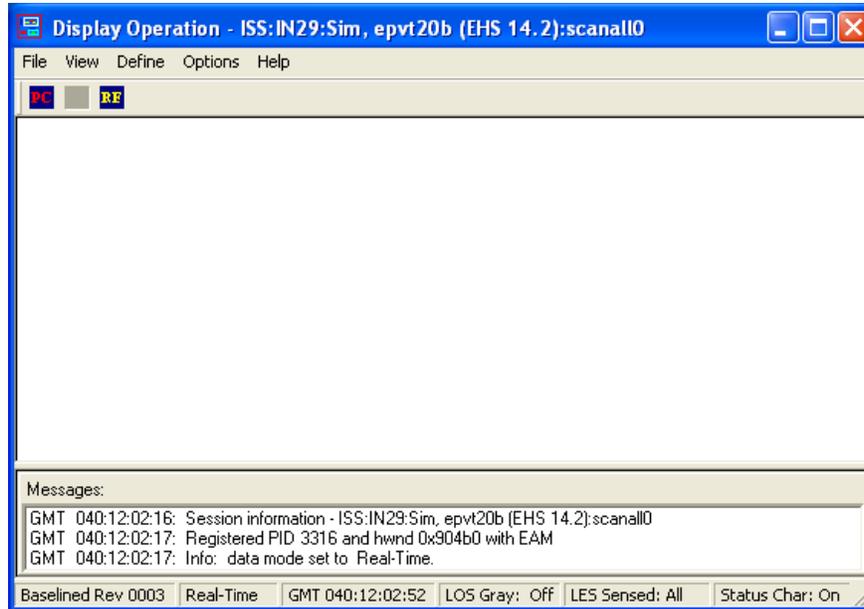
This command track will show all commands that were sent while the command track window was open. The user will be able to see any command from any user sending commands through MSFC.

1. Select Operation from the EPC Launchpad
2. Select Command Track
3. Use to view commands that are being sent to ISS

Space Communications and Navigation (SCaN) Testbed Project		
Title: SCAN Testbed Console Handbook Volume 1 ISS Interfaces	Document No.: GRC-CONN-OPS-0176 Vol 1	Revision: –
	Effective Date: 05/04/2012	Page 12 of 68

### 3.4.2 Launch a PRO Display

1. The PROs have several displays that contain system information from ELC3. The displays have been copied to a local directory: C:\EHS\user\connectops\ISS-IN32\scanall0\dsp. The name of the display with current and voltage information is ELC3\_HS\_MAIN and the one for RTD temperature information is ELC3\_ANALOGS. Select Operation from the EPC Launchpad
2. Select Display Operation



3. Select File Open and choose a display. The file extension should be dsp.
4. To open another PRO display, repeat steps 1 – 3.

### 3.4.3 Launch the ISS Pointing and RTD Display

A display has been created for the ISS Pointing data from the Broadcast Ancillary Data and for the RTD data from ELC3. It is accessed in the same manner as the PRO displays.

1. Select Operation from the EPC Launchpad
2. Select Display Operation
3. Select File Open and choose PointingandRTDdata.dsp.

Space Communications and Navigation (SCaN) Testbed Project		
Title: SCAN Testbed Console Handbook Volume 1 ISS Interfaces	Document No.: GRC-CONN-OPS-0176 Vol 1	Revision: –
	Effective Date: 05/04/2012	Page 13 of 68

### 3.5 Start the EHS Web Launchpad

The EHS Web Launchpad is the interface to the MSFC Web Servers. This interface uses Internet Explorer. The Web Launchpad is used to start GSE data packet flow, file transfers, and PIMS which includes OCRs.

1. Double click on the EHS icon on the desktop



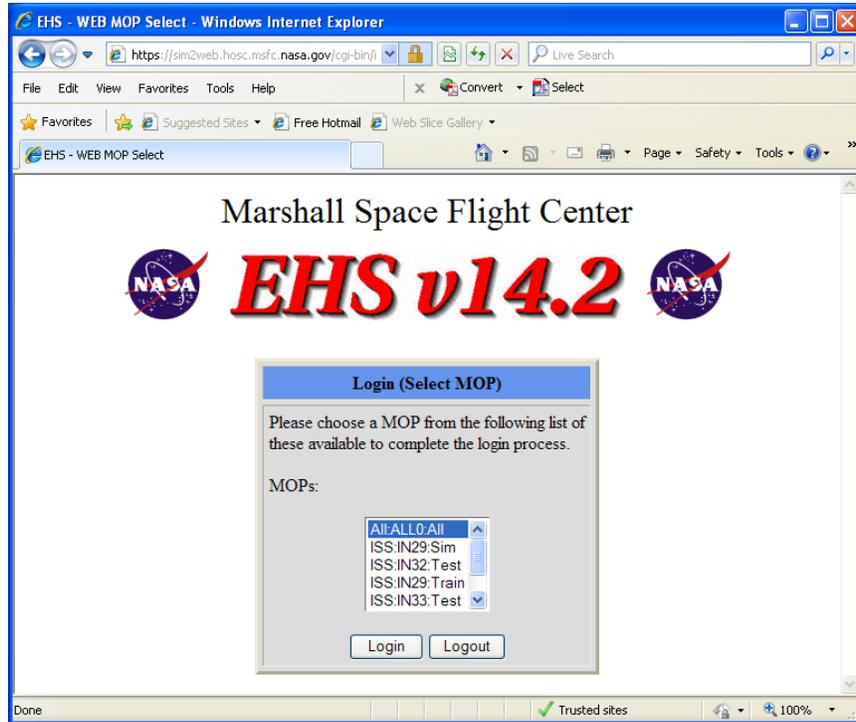
2. Select the Web Server (see [Section 10.2](#)) from the drop down menu and select OK.



3. A warning window may appear if the EHS Version that was selected does not match the version the server is running. The EHS versions should match.
  - a. Under EHS Version, select from the pull-down list the version that matches what the server is running.
4. An Internet Explorer page will appear. It may indicate that there is a problem with the security certificate. Select 'Continue to this website'.
5. In the Login window that appears, enter the Username scan110
6. Enter the password (see [Section 10.1](#)).

Note: Leave the Passcode blank.

7. Select a MOP (see [Section 10.2](#))



8. Select Login
9. The launchpad will appear



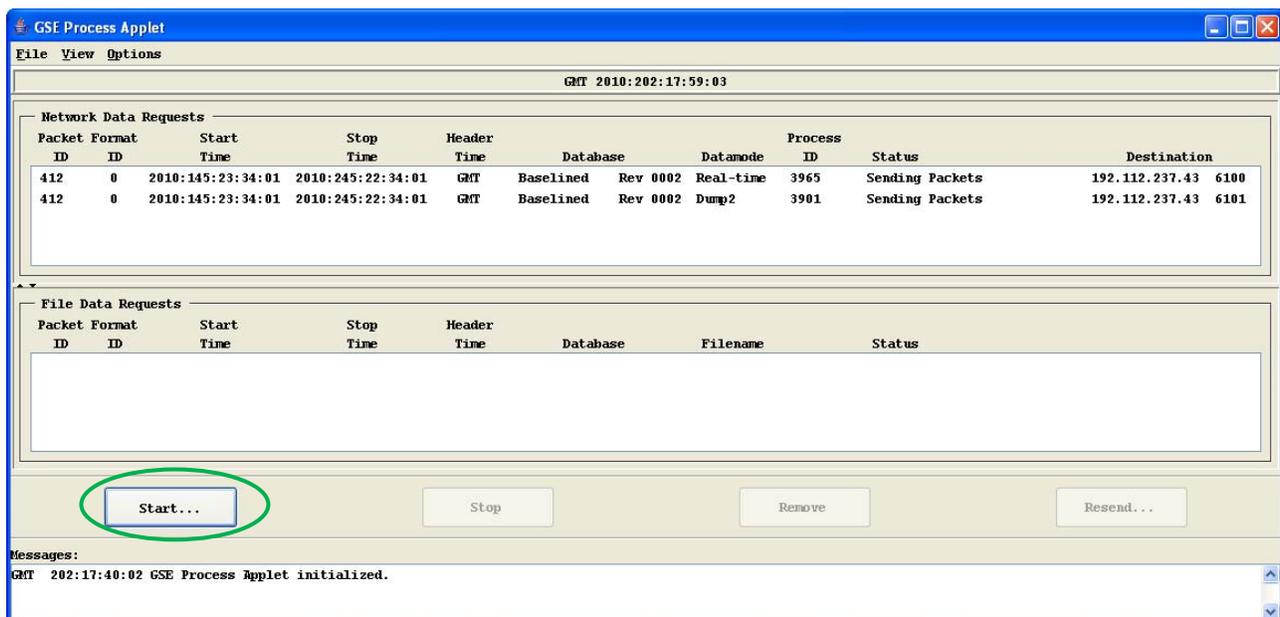
10. Minimize the Internet Explorer window

### 3.5.1 Start the GSE Packets

GSE data is a user-defined subset of the ISS Health and Status data found in APID 876. Each payload can request to be assigned APIDs for their GSE packets. Once an APID is assigned, it can be populated with telemetry from APID 876. SCAN Testbed has APIDS 548 and 555. The GSE packets have been pre-configured and the formats saved.

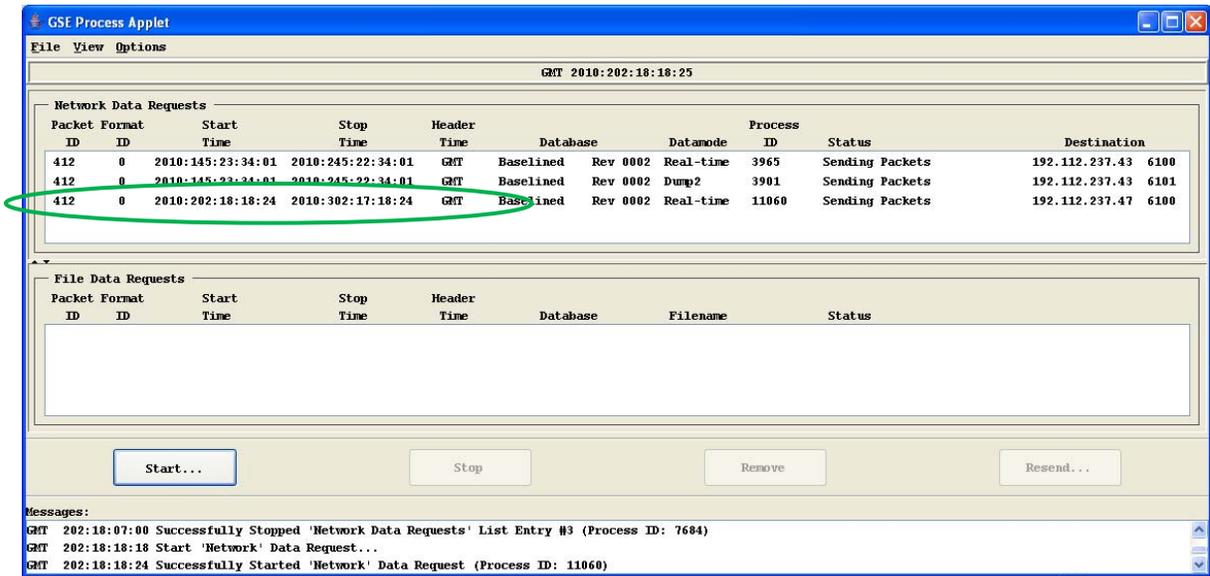
The GSE packet is the only data that does not come to the TSC automatically. It must be started by the user in order to receive the data. The GSE APIDS will be directed to the SCAN Testbed Mass Storage TReK. There they will be recorded and broadcast to the STCC TReKs.

1. Select Operation on the EHS Web Launchpad
2. Select GSE Packets. A window labeled GSE Process Applet will open



3. Select the Start Button on the GSE Process Applet window
4. In the Start Window, fill in the following 6 fields according to Table 3-2

5. Make sure the follow is true:
  - Transfer Mode: Network Packets
  - Header Time: GMT
  - Output Rate: Latest Packet
6. Press the Add arrow. This will send the data to the SCAN TReK Workstations.
7. Press the Start button
8. Verify that the packet has started in the GSE Process Applet window



9. Repeat steps 3 – 7 for each destination and data mode in Table 3-2

**Table 3-2—GSE Packets**

Packet ID	Format	Data Mode	Timeout (GMT)	Destination address*	Destination Port	Description
548	1	Real-time	000:18:00:00	xxx.xxx.xxx.188	6100	Health & Status, parent MSIDs only, AOS/LOS indicators
548	1	Dump2 (LOS data from HCOR)	000:18:00:00	xxx.xxx.xxx.188	6111	Health & Status, parent MSIDs only, AOS/LOS indicators
555	2	Real-time	099:23:00:00	xxx.xxx.xxx.188	6200	ISS Pointing data, Beta Angle, RTD data from ELC3
555	2	Dump2 (LOS data from HCOR)	099:23:00:00	xxx.xxx.xxx.188	6222	ISS Pointing data, Beta Angle, RTD data from ELC3

\* xxx.xxx.xxx represents the designated subnet for the TSC

### 3.5.2 Launch the PIMS Applications

For more details on PIMS, please refer to the HOSC documents HOSC-EHS-1136 “Using the Huntsville Operations Support Center (HOSC) Payload Information Management System (PIMS) Software” and HOSC-WKBK-2150 “Workbook 11: Using the Payload Information Management System (PIMS).”

To open an application, select PIMS from the launchpad and choose either To-Do List, Documents or OCRs.



### 3.6 IDE Workstation Activation

The IDE computer is used for the scanops email account, the console log, and web pages that are not available through the TReK.

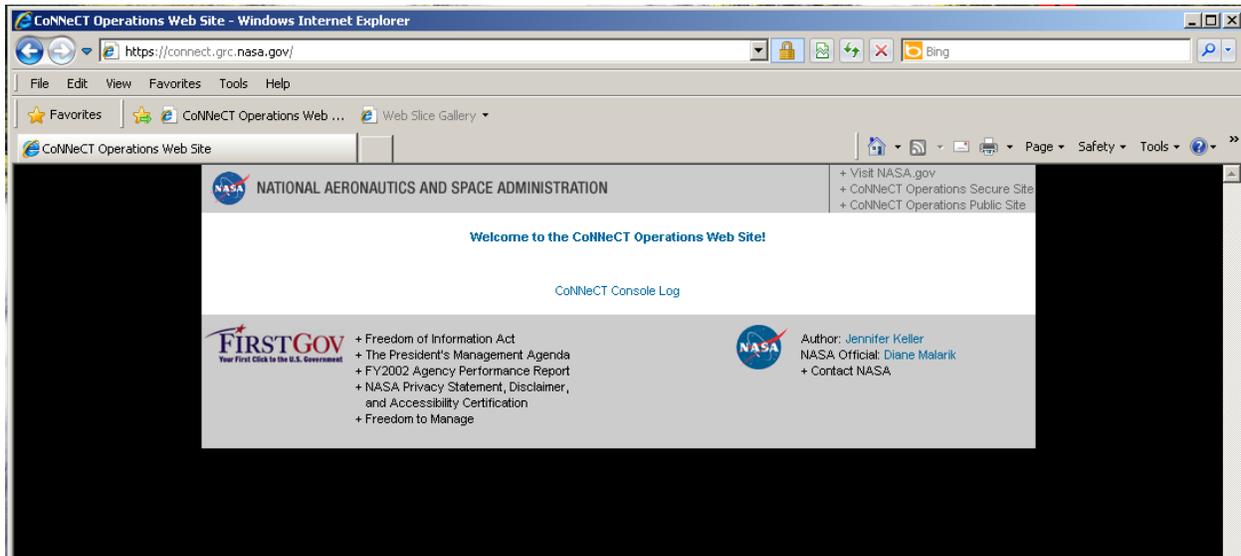
The IDE computer is just a regular computer on the GRC Campus Network. This allows users the same Internet connection that they have at their desk.

1. Select CTRL+ALT+DELETE
2. Enter **scanops** for Username
3. Enter the password (see [Section 10.1](#))
4. Enter **GRC** for domain
5. Select OK

Space Communications and Navigation (SCaN) Testbed Project		
Title: SCAN Testbed Console Handbook Volume 1 ISS Interfaces	Document No.: GRC-CONN-OPS-0176 Vol 1	Revision: –
	Effective Date: 05/04/2012	Page 19 of 68

### 3.6.1 Launch the Console Log Application

The SCAN Testbed log is online at <https://connect.grc.nasa.gov/> . It can be opened in either Firefox or Internet Explorer. It can be accessed from an IDE computer as well as a STCC TR&K.



1. Enter your Username and password
2. Select OK
3. Select the Console Log link

## 4.0 CONSOLE OPERATIONS

### 4.1 Commanding

In order to command the flight system, permission must be obtained from the POIC. At the beginning of the shift the OC and PRO will have been briefed on the planned activities. Based on this, the PRO will obtain approval from the POD to enable SCAN Testbed to command. During LOS periods, commanding will be disabled for all payloads. Commanding will be re-enabled when AOS returns.

#### 4.1.1 Description of Commands

The list of available commands and descriptions can be found in GRC-CONN-DBK-0128 Command and Telemetry Databook. A subset of commands has been given to the PROs for contingency situations. The commands are documented in POIF-1190 NASA Payload Regulations, which can be found at the POIF website (see [Section 11.3](#))

#### 4.1.2 Critical Commands

There is a subset of commands that have been defined as critical by the PSRP. These commands will not be in the SCAN Testbed command database. They will reside in the POIC command database and will be sent by the PRO.

**Table 4-1—Critical Commands**

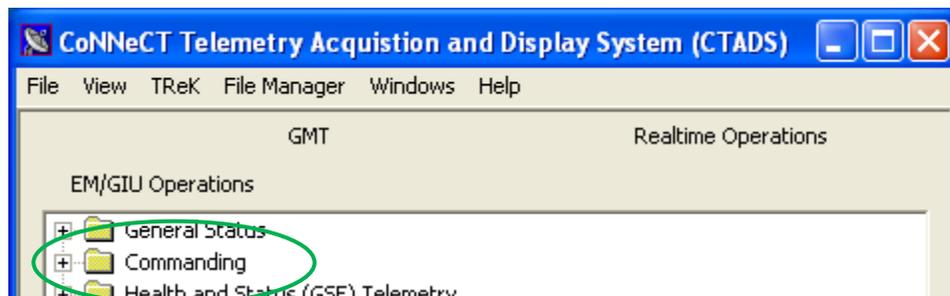
MNEMONIC	ACTION
STB_HARRIS_PWR1_ARM	allows the STB_HARRIS_POWER1_ON command to be accepted within 60 seconds
STB_HARRIS_PWR2_ARM	allows the STB_HARRIS_POWER2_ON command to be accepted within 60 seconds
STB_HARRIS_POWER1_ON	turns on the primary power to the Harris SDR
STB_HARRIS_POWER2_ON	turns on the redundant power to the Harris SDR
STB_TWTA_ARM	allows the STB_TWTA_POWER_ON command to be accepted within 60 seconds
STB_TWTA_POWER_ON	turns on the power to the TWTA
STB_DIGIO_JPL_ARM	allows the STB_DIGIO_JPL1_ON command to be accepted within 60 seconds
STB_DIGIO_JPL1_ON	turns on the JPL SDR's primary power
STB_RDIGIO_JPL_ARM	allows the STB_RDIGIO_JPL2_ON command to be accepted within 60 seconds
STB_RDIGIO_JPL2_ON	turns on the JPL SDR's redundant power
STB_DIGIO_GD_ARM	allows the STB_DIGIO_GD_SDR1_ON command to be accepted within 60 seconds
STB_DIGIO_GD_SDR1_ON	turns on the GD SDR's primary power
STB_RDIGIO_GD_ARM	allows the STB_RDIO_GD_SDR2_ON command to be accepted within 60 seconds
STB_RDIO_GD_SDR2_ON	turns on the GD SDR's redundant power

<b>Space Communications and Navigation (SCaN) Testbed Project</b>		
Title: SCAN Testbed Console Handbook Volume 1 ISS Interfaces	Document No.: GRC-CONN-OPS-0176 Vol 1	Revision: –
	Effective Date: 05/04/2012	Page 21 of 68

### 4.1.3 Sending a Command

Commanding is performed on CTADS.

1. From the CTADS main screen, expand the Commanding folder, Launch TReK



2. Select Send Commands
3. Select the desired Command Destination
4. Select the desired command
5. If there are parameter fields, populate them
6. Select Arm
7. Select Send
8. Verify in the message screen that the command has been received and processed.

## 4.2 Telemetry

The telemetry parameters are described in GRC-CONN-DBK-0128 Command and Telemetry Databook.

### 4.2.1 Primary Paths for Telemetry

#### 4.2.1.1 LRDL (1553)

The Low Rate Data Link is also called 1553. The Low Rate Telemetry (LRT) APIDs (see Section 4.2.2) are downlinked via the 1553. This includes the Command Responses, Squawk Messages, Software Errors, and Low Rate File Downlink. Commands and Low Rate File Uplinks are sent to SCAN Testbed on the 1553. File transfers to and from the PLMDM to SCAN Testbed are done on the 1553. The LRDL also carries the Health & Status packets to ELC3.

#### 4.2.1.2 HRDL (Ethernet)

The majority of the SCAN Testbed telemetry is sent out on the High Rate Data Link. The High Rate Telemetry (HRT) APIDs listed in Section 4.2.2 are carried on the HRDL as well as the High Rate File Downlink.

## 4.2.2 APIDs

The following table lists the APIDs assigned to SCAN Testbed. The APIDs are sent to the Mass Storage TReK in the Server Room where they are recorded and then distributed to the TReKs in the TSC.

APID	Type	Content	Nom Rate (Mbps)	Data Mode	Port Number
1340	HRT	GD SDR	.0014	Real-time Dump2	6140 6240
1341	HRT	JPL SDR	.0028	Real-time Dump2	6141 6241
1342	HRT	Harris SDR	.0028	Real-time Dump2	6142 6242
1343	HRT	File Manager	.0014	Real-time Dump2	6143 6243
1344	HRT	Avionics, APS, Command Status	.0042	Real-time Dump2	6144 6244
1347	HRT	High Rate File Downlink	1366 bytes/packet (unknown max)	Real-time	6147
		HRT Total	.0126		
1345	LRT	Avionics, Command Responses, Squawks, SW Errors	.01024	Real-time Dump2	6145 6245
1346	LRT	Low Rate File Downlink	.001 (970 bytes/pkt, 1 pkt/sec max)	Real-time	6146
n/a	LRT	Health & Status to ELC	.00614	n/a	n/a

## 4.2.3 Displaying GSE Packets

There are two predefined GSE packets. One contains the SCAN Testbed Health & Status and the other contains the ISS Pointing data, Beta Angle, and the RTD data from ELC3.

The Health and Status (APID 548 Format 1) is displayed in CTADS.

The ISS Pointing and RTD data (APID 555 Format 2) is displayed using EPC (see Section [3.4.3](#))

## 4.2.4 Telemetry Caution and Warning Ranges

The caution and warning ranges for telemetry that has associated limits are given in GRC-CONN-RPT-0227 Failure Detection, Isolation, and Recovery (FDIR) Report. A binder at the STCC console contains a printout of the limit information.

### 4.3 Requesting a NRT Playback

A Near Real-Time (NRT) Playback is requested from the EHS Web launchpad.

1. From the EHS Web launchpad, select Operation, then NRT Playback Request
2. In the Playback Request window, enter the Request Name

The screenshot shows the 'NRT Playback Request' window with the following fields and controls:

- Playback Request Information:**
  - Request Name: [Text Input Field]
  - Playback Channels: [Any] (Dropdown)
  - Meter Rate: [IX] (Dropdown)
  - Delay Time: [0] (Text Input) with up/down arrow buttons.
- Time Information:**
  - Time Source:  Embedded Time,  HDSC Receipt Time
  - Time Reference: [GMT] (Dropdown)
  - Start Time: [2012] (Year) [001] (Hour) [00] (Minute) [00] (Second) [00] (Millisecond)
  - Stop Time: [2012] (Year) [001] (Hour) [00] (Minute) [00] (Second) [00] (Millisecond)
- Packet Identification:**

Protocol	APID	APID Extension	Source Data Mode
- Buttons:** [Submit...], [Validate...]
- Messages:** [Empty text area]

3. Enter the start and stop times in GMT. Make sure the Time Source is set for Embedded Time.
4. In the Packet Identification section, right click in the cell below Protocol. Select either PDSS Payload or GSE from the list.
5. Double click in the cell below APID and enter the APID number you want replayed. More than one APID can be replayed as long as the time slice is the same.
6. Select Submit.

<b>Space Communications and Navigation (SCaN) Testbed Project</b>		
Title: SCAN Testbed Console Handbook Volume 1 ISS Interfaces	Document No.: GRC-CONN-OPS-0176 Vol 1	Revision: –
	Effective Date: 05/04/2012	Page 24 of 68

## 4.4 File Uplinks/Downlinks

Information about file sizes and management can be found in GRC-CONN-PLAN-0130 Data Management Plan.

### 4.4.1 Uplink/Downlink Using the PLMDM

In order to uplink or downlink large files (>100 kBs), the PLMDM must be used as an intermediary. A payload team cannot place or retrieve a file from the PLMDM. This activity must be requested and coordinated through the OCR process (see [Section 4.6](#)).

Since the Resource Impacts tab of the OCR is only designed for a single file, the OCR must include a supporting attachment containing a table of filenames and sizes. The supporting attachment should be MS Word, MS Excel, text format, etc so that PRO can copy and paste from it, as opposed to a jpeg or PDF format.

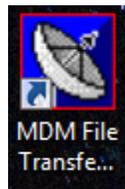
The OCR must state when the files can be deleted from the PLMDM, EMU and ELC.

Files that will be uplinked to and downlinked from the PLMDM will be stored on CONDB. Access to CONDB is available from the STCC TReKs.

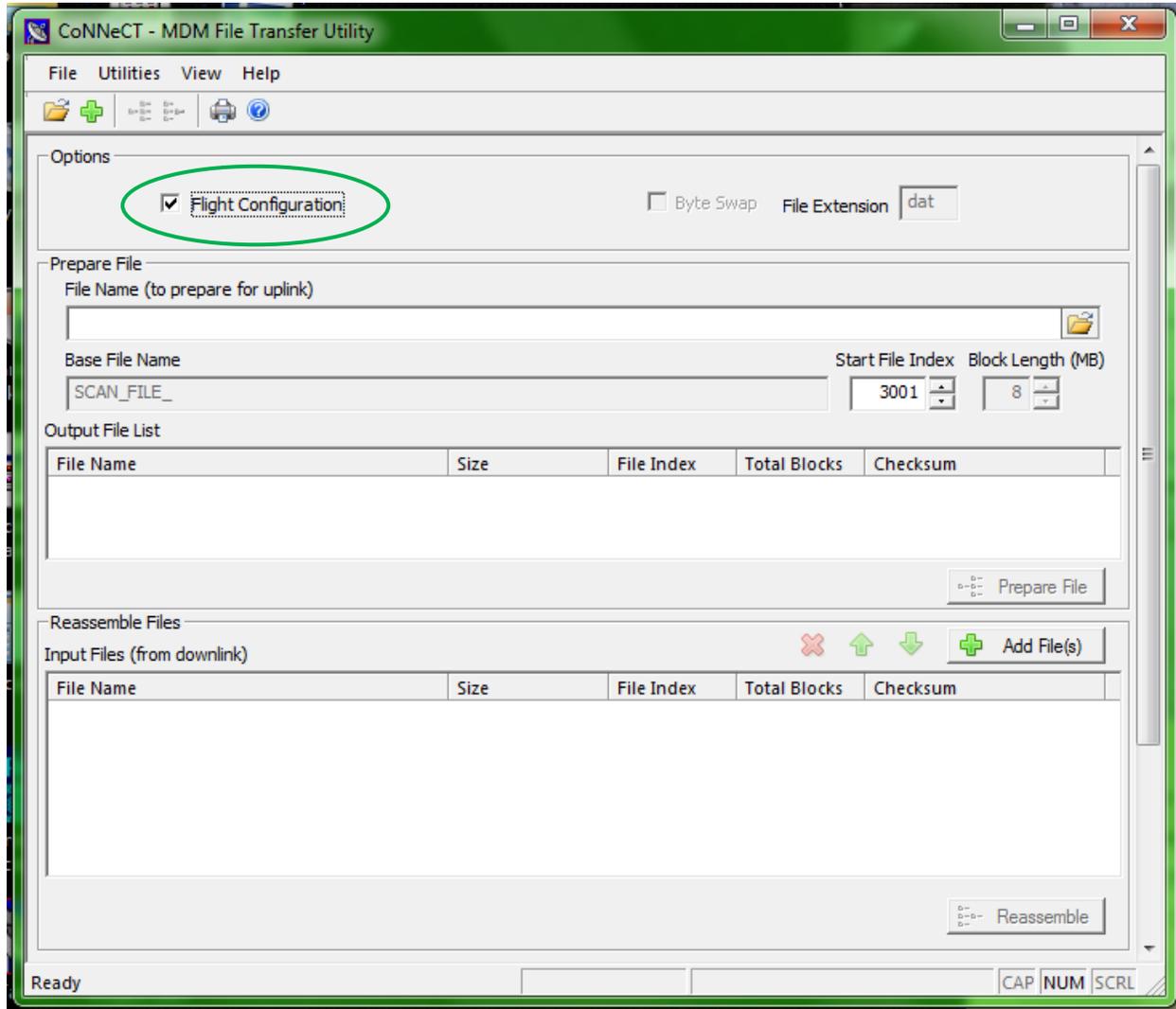
#### 4.4.1.1 Preparing a File for Uplink

The file to be uplinked must be prepared and placed into PIMS. The MDM File Transfer Utility is a program on the TReK that will split the file, rename the segments to the pre-assigned names, and calculate the checksums.

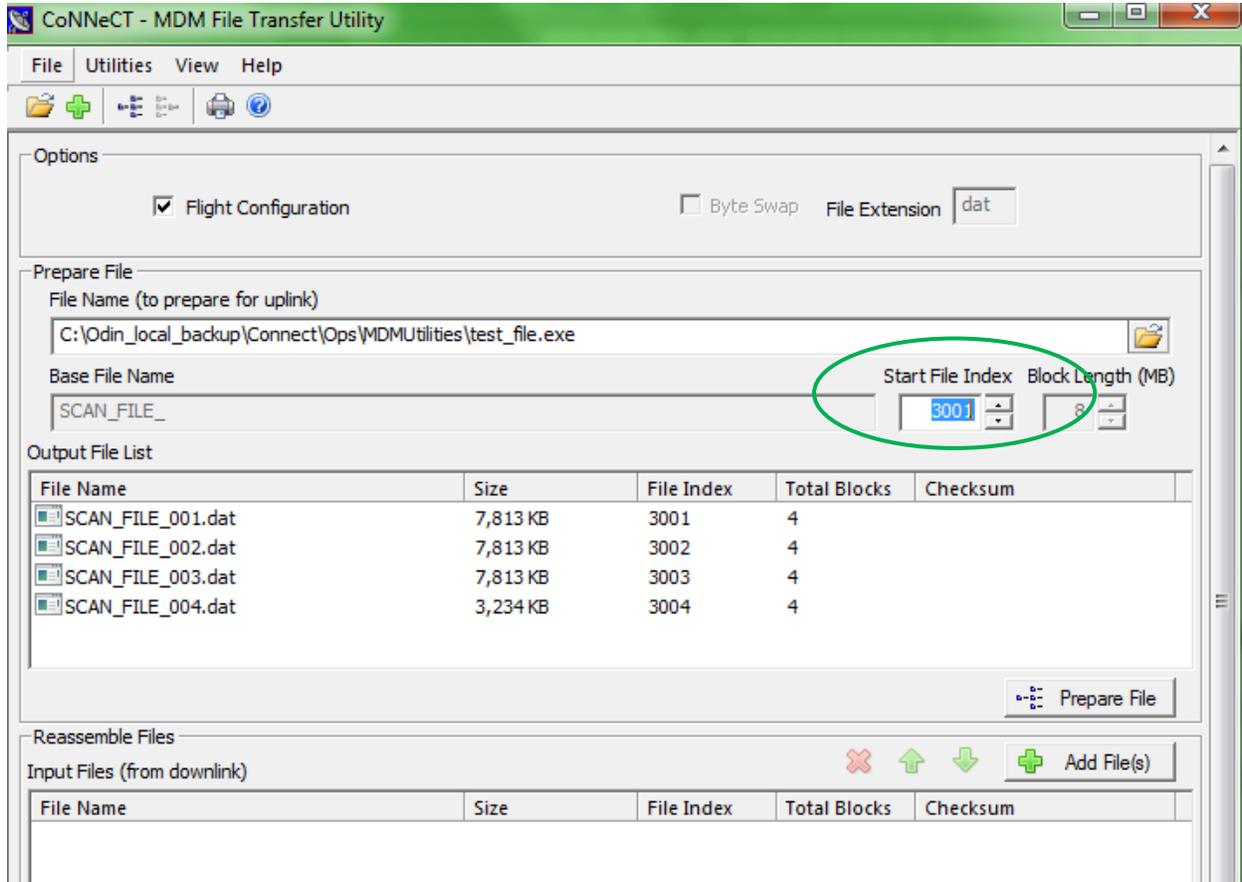
1. Click on the MDM File Transfer Utility icon



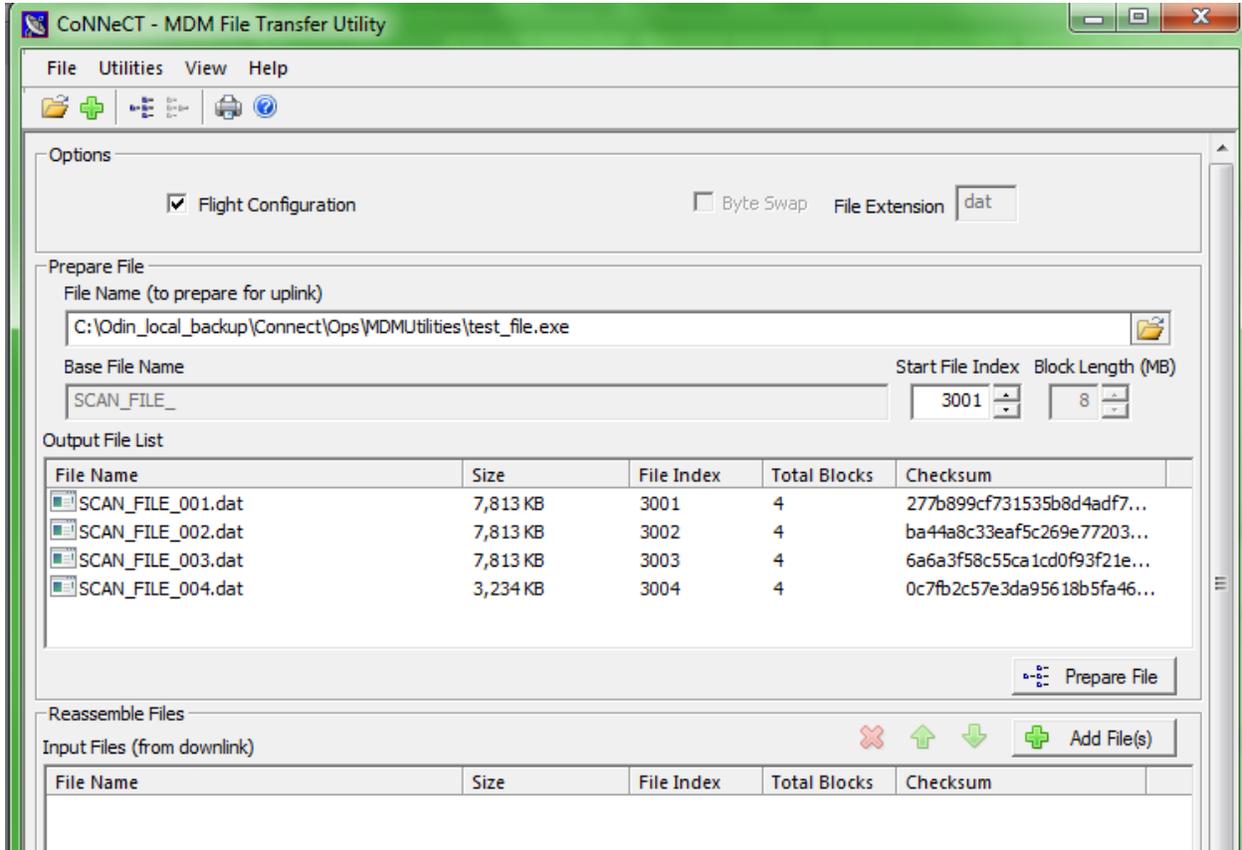
2. Verify that the Flight Configuration box is checked



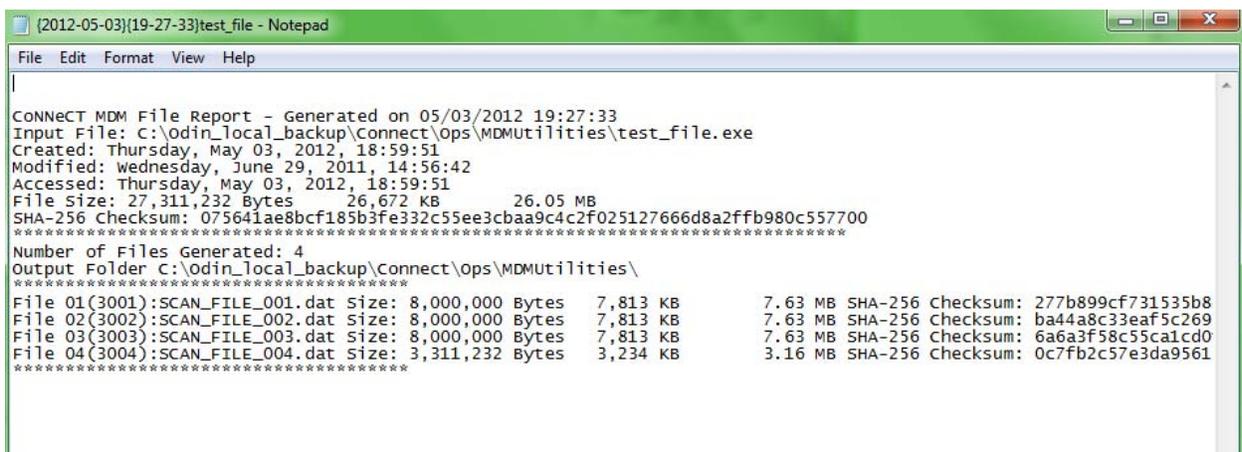
3. Verify that the Flight Configuration box is checked
4. Click on the folder icon to select the file to be prepared. These will be on CONDB under uplink\base files.
5. The Output File List will be populated. The starting number of the file block can be changed by modifying the Start File Index.



6. Click on the Prepare File button
7. A window will appear asking where to save the files. These will be placed on CONDB under uplink\prepared files.
8. The Output File List will now have checksums for all the files.



- A report will automatically open in a Notepad window. This file will be saved in the same location as the prepared files. The report filename is a timestamp plus the prepared file name such as {2012-05-03}{19-27-33}test\_file



- These files are now ready to be put into PIMS (EHS Web Launchpad)

Space Communications and Navigation (SCaN) Testbed Project		
Title: SCAN Testbed Console Handbook Volume 1 ISS Interfaces	Document No.: GRC-CONN-OPS-0176 Vol 1	Revision: –
	Effective Date: 05/04/2012	Page 28 of 68

#### 4.4.1.2 Submitting a File for Uplink/Downlink

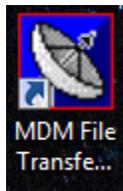
To uplink a file, it must be stored in the appropriate Payload Information Management System (PIMS) folder and have an approved Operations Change Request (OCR). If the payload file is downlinked, then a file name must be registered in PIMS and a separate OCR submitted to perform the downlink. This process is outlined on SOP 6.22 Submitting a File for Uplink/Downlink and Transfer Through the PLMDM.

Files for uplink should be place in the folder Documents/Miscellaneous/PRO/Uplink Files/Payloads/SCAN. For downlinks, a file must be registered in the folder Documents/Miscellaneous/PRO/Downlink Files/SCAN

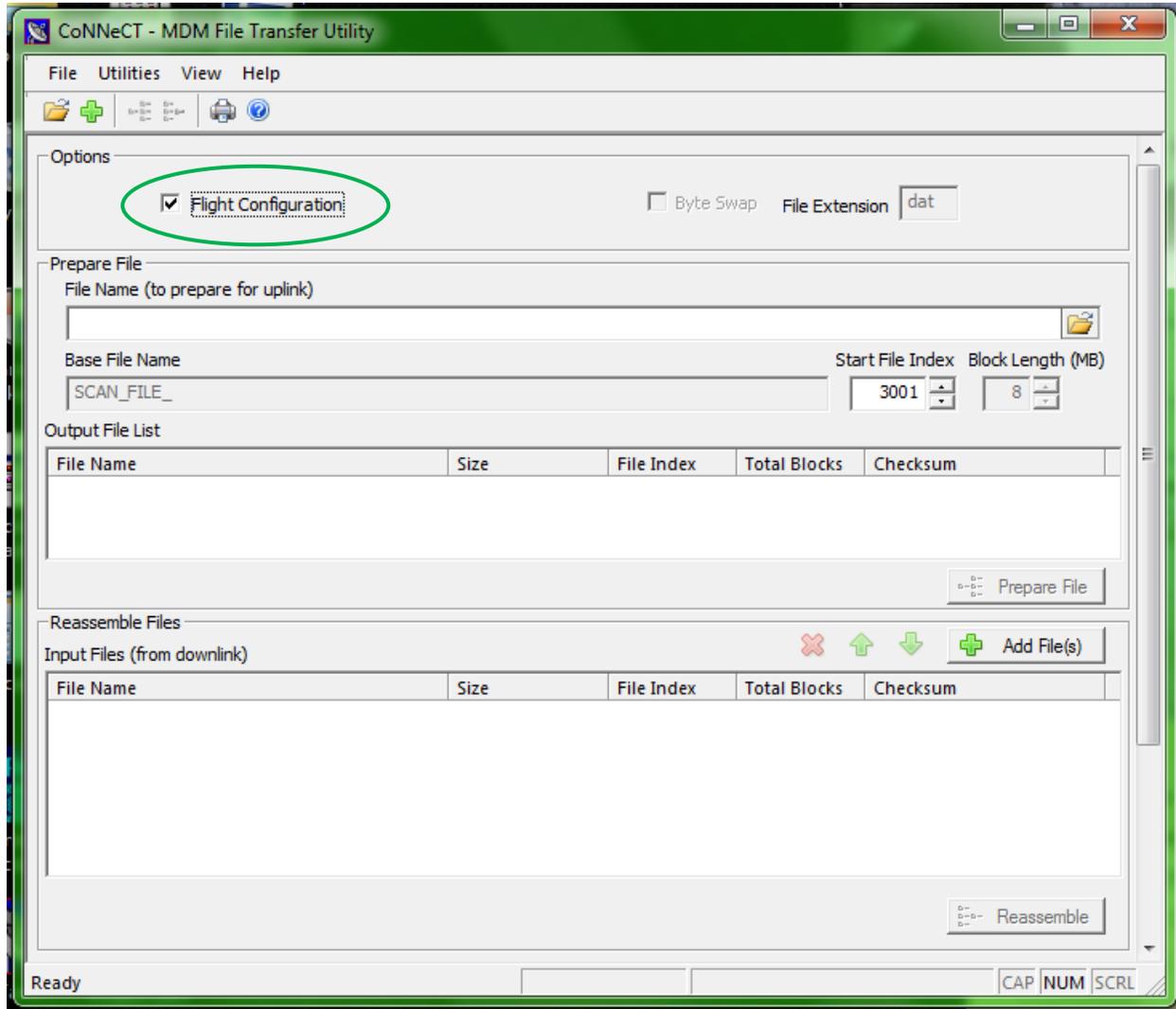
#### 4.4.1.3 Reassembling a Downlinked File

The MDM File Transfer Utility is a program on the TReK that reassembles the downlinked files and calculates the checksums. These steps assume the downlinked files have been retrieved from PIMS and are on CONDB under downlink\input files

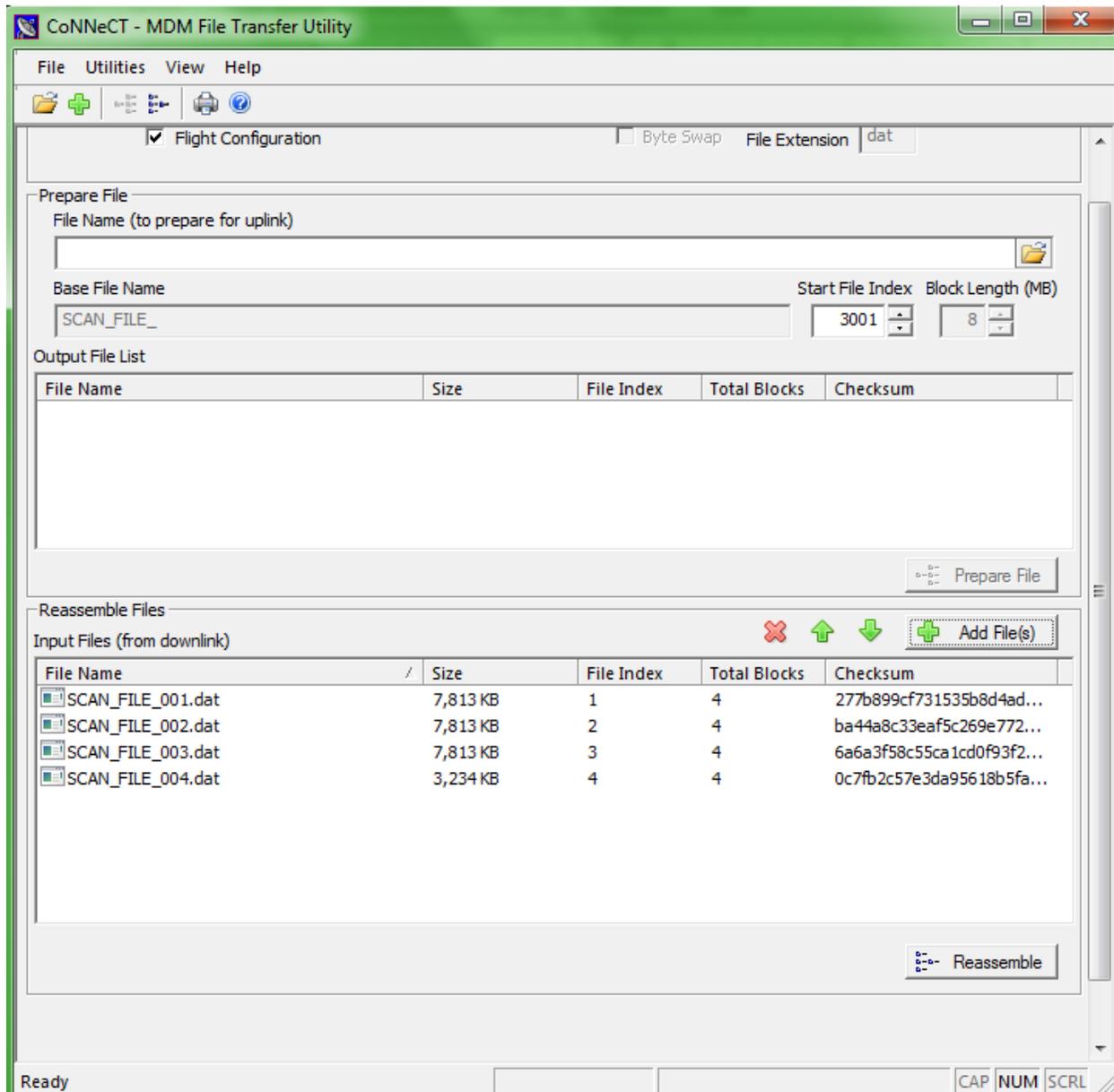
1. Click on the MDM File Transfer Utility icon



2. Verify that the Flight Configuration box is checked



3. Click on Add File(s). This will open a browse window. At this time, you must select each file individually.



4. Once all the files are listed, click on Reassemble.
5. A window will open requesting the new file name and where to save it. Be sure to add the file extension (it should match the extension of file that was sent from the Avionics to the PLMDM). Save it on CONDB under downlink\reassembled
6. A report will automatically open in a Notepad window. This file will be saved in the same location as the reassembled file. The report filename is a timestamp plus the reassembled file name such as {2012-05-03}{19-27-33}test\_file

Space Communications and Navigation (SCaN) Testbed Project		
Title: SCAN Testbed Console Handbook Volume 1 ISS Interfaces	Document No.: GRC-CONN-OPS-0176 Vol 1	Revision: –
	Effective Date: 05/04/2012	Page 31 of 68

#### 4.4.2 Uplink Using Commanding

If a file is under 100 kBs, it can be uplinked by commanding. Before loading the file on the commanding TReK, it must be scanned for viruses. Once the file is on the TReK, use the flight procedures to complete the uplink.

#### 4.4.3 Downlink Using Commanding

Use the flight procedures to downlink a file. The limit is 200 packets/second to avoid dropping packets. After it has been received on the TReK, it should be copied into CONDB.

#### 4.5 Playback of a TReK Recording

TReK recordings are saved to C:\Connect\Trek\Recordings on the TReK workstation. These files are only readable by TReK; they cannot be opened using other applications, such as Notepad or Excel. However, if data is logged using the CTADS logging feature, comma separated value (\*.csv) files will be created, which are readable using applications such as Notepad or Excel. These user-friendly log files are stored at C:\Connect\Logs.

File names for all TReK recordings follow the same naming convention. Recording file names begin with “TRT”. Two date stamps and time stamps follow “TRT” in the file name. The first date/time stamp indicates the beginning of the recording (GMT), and the second date/time stamp indicates the ending time of the recording (GMT). The final part of the file name indicates which APID data the recording contains.

An example file name is:

TRT 2011-08-24 13~57~19~812 2011-08-24 14~50~03~484 APID1340

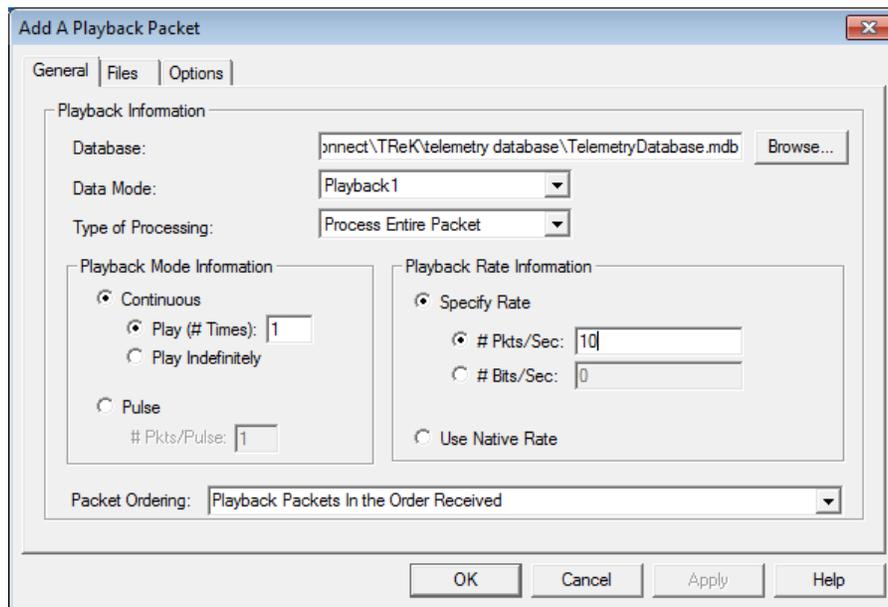
This indicates that the file contains a recording of GD Radio data from August 24, 2011 for the time period 13:57:19:812 (GMT) through and including 14:50:03:484 (GMT).

##### 4.5.1 Instructions for Setting Up TReK Playback

This section details the steps for setting up the TReK Telemetry Processor for playing back previously recorded data.

1. Open TReK Telemetry Processing by double clicking the desktop icon.
2. From the menu at the top, choose Packet → Add a Playback Packet.
3. On the general tab, use the “Browse” button to browse to C:\Connect\TReK\telemetry database\TelemetryDatabase.mdb and select “Open”.
4. Select Data Mode: “Playback1”. Note that this value must correlate to the mode chosen in step 2 in Section 4.5.2 CTADS set-up.
5. Specify the playback rate in packets per second you’d like to use as “# Pkts/Sec”.
  - a. NOTE: Usually 10 packets/second is safe to speed up telemetry playback for logging. However, sometimes if a rate higher than 10 is selected, packets may be dropped.

6. All other parameters remain the default.
  - a. You may choose to playback packets indefinitely for demonstration purposes, but do not choose this setting to log data, or you will log data until you manually stop data flow!
  - b. You may also choose to “pulse” data playback, which will allow you to press “Ctrl+P” to get the specified number of packets per pulse. Telemetry will not flow automatically, and will only update at each manual pulse.
  - c. Note that it doesn’t make sense to record playback telemetry, since it has already been recorded! So, recording should always be off (on the “Options” tab) when playing back previously recorded data.



7. On the “Files” tab, you may either browse for entire recording files or you may specify a time period and default location where associated recordings are found.
  - a. To specify a specific time period for playback:
    - i. Click “Add...”
    - ii. Enter the starting date and time (GMT).
    - iii. Enter the ending date and time (GMT).
    - iv. The Original Base Filename is “APIDXXXX”, where XXXX = the APID number you’re playing back. For example, for playing back avionics data, you would enter “APID1344”.
    - v. Browse to the original recorded data directory, which is where the recording resides. It should be similar to:  
C:\Connect\TReK\Recordings\APID1344 2011-08-18 11~33~03\.

**Modify**

Start Time: Year: 2011, Month: 8, Day: 18, Hour: 12, Min: 0, Sec: 0, msec: 0

Stop Time: Year: 2011, Month: 8, Day: 18, Hour: 12, Min: 59, Sec: 59, msec: 0

Original Base Filename: APID1344

Original Recorded Data Directory: C:\Connect\TReK\Recordings\APID1344 2011-08-18

Buttons: OK, Cancel, Help

vi. Click “OK”.

**Add A Playback Packet**

General | Files | Options

Retrieve Packets Based On:  TReK Receipt Time  Spacecraft Time

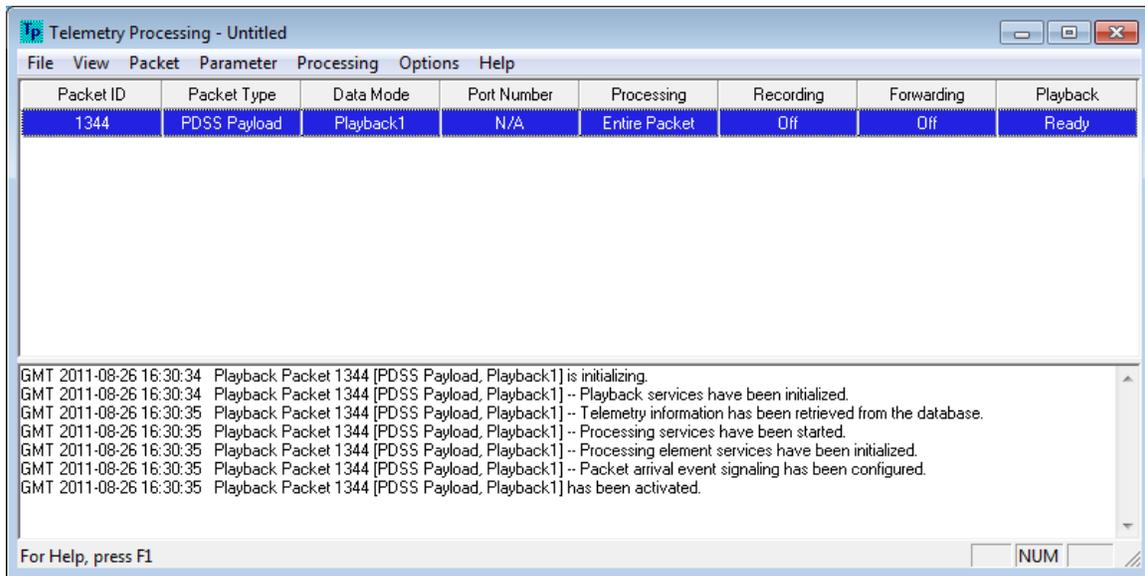
Identify one or more Playback Streams (Files Containing Recorded Data)

Start Time	Stop Time	Packet ID	Packet Type
2011-08-18 12~00~00~000	2011-08-18 12~59~59~000	1344	PDSS Payload

Buttons: Add..., Browse..., Modify..., Delete

Buttons: OK, Cancel, Apply, Help

8. All other parameters remain the default.
9. Click “OK”.
10. The packet you just added will be black until you activate it. Right click on the packet and choose “Activate Packet”, and it will turn blue:

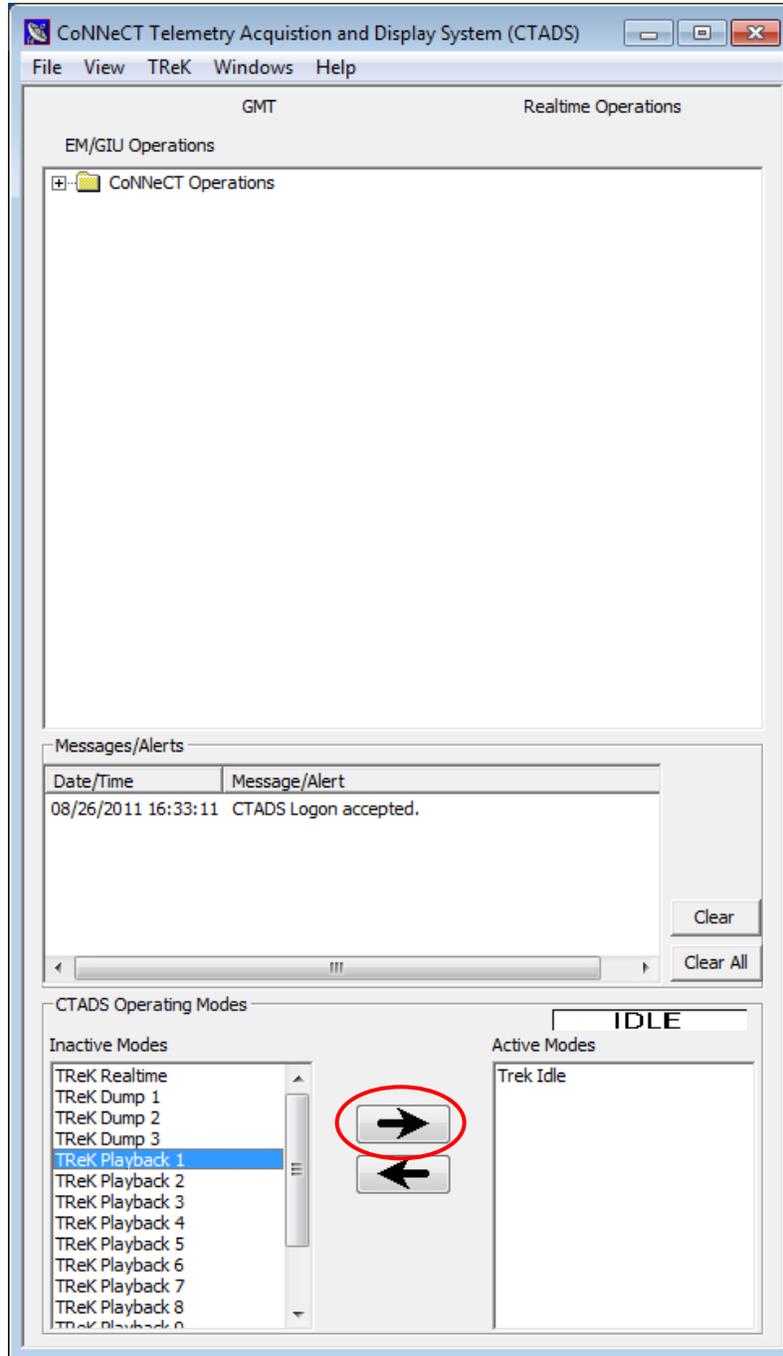


11. Your packet is now ready for playback! You may repeat steps 1-9 to add more APIDs to play back. For example, we’ve just added a playback packet for avionics data (APID1344). You may also add a playback packet for the GD SDR (APID 1340).

#### 4.5.2 Instructions for Setting Up CTADS for Playback

This section details the steps for setting up CTADS for playing back, displaying, and logging previously recorded data.

1. Open CTADS by double clicking the desktop icon.
2. Select “TReK Playback 1” (or whichever mode you chose in TReK in step 4 of Section 4.5.1) in the bottom left, and choose the right pointing arrow to add this mode to the active modes:



3. Open the screens you'd like to view for data playback.
4. If you'd like to log data to a comma separated value (\*.csv) file, easily readable in Excel, open an ad hoc window for each Excel file you'd like to create:
  - a. Select the telemetry you'd like to log.
  - b. Enable logging in CTADS. Ensure "Log Flight Time" is checked; otherwise, the log file will contain the date/time of playback (current date/time) and not the recorded date/time.

**Log Configuration** [X]

Enable OK

First line is header Cancel

Base File Name

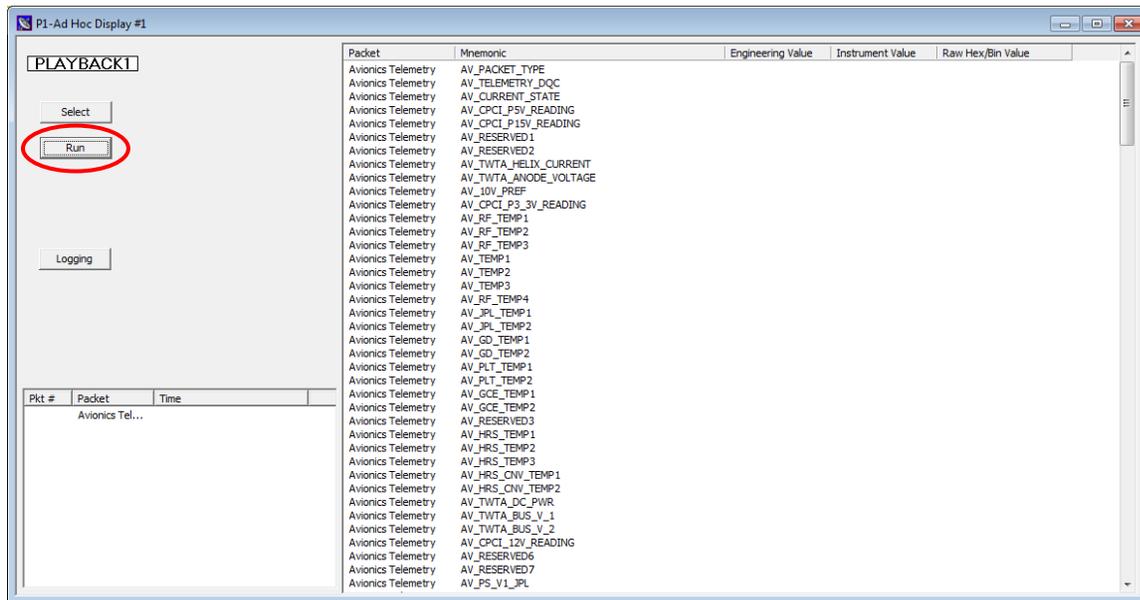
Column Format Log Value Type  
 Instrument Value     Engineering Value

Maximum Log Size  Megabytes (MB)

Log Path  
 

Time Values  
 Log Flight Time     Log TReK PC Time

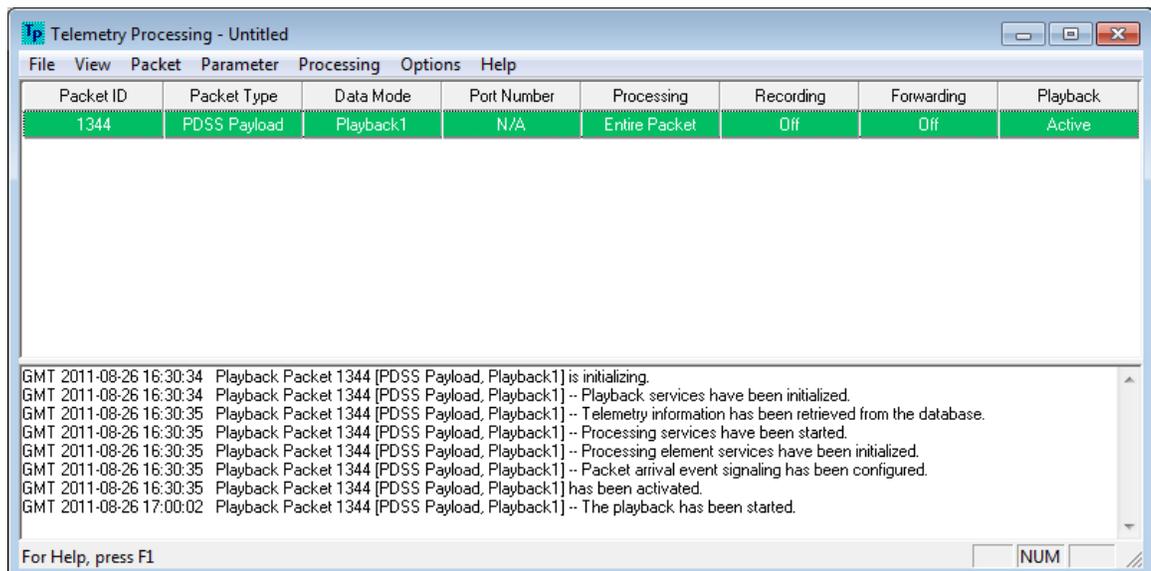
- Click “Run” to begin the logging process. NOTE: Data will not appear until you complete the steps below to begin TReK playback!



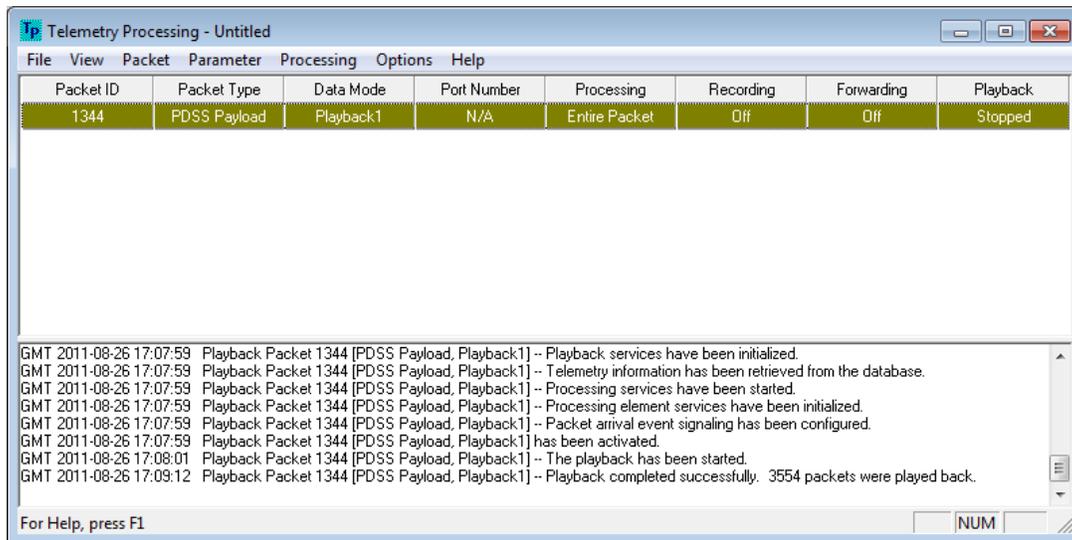
#### 4.5.3 Starting Telemetry Playback in TReK

This section details the steps for starting the telemetry data flow for playback in the TReK Telemetry Processor. If this step is not performed, you will not see or log data!

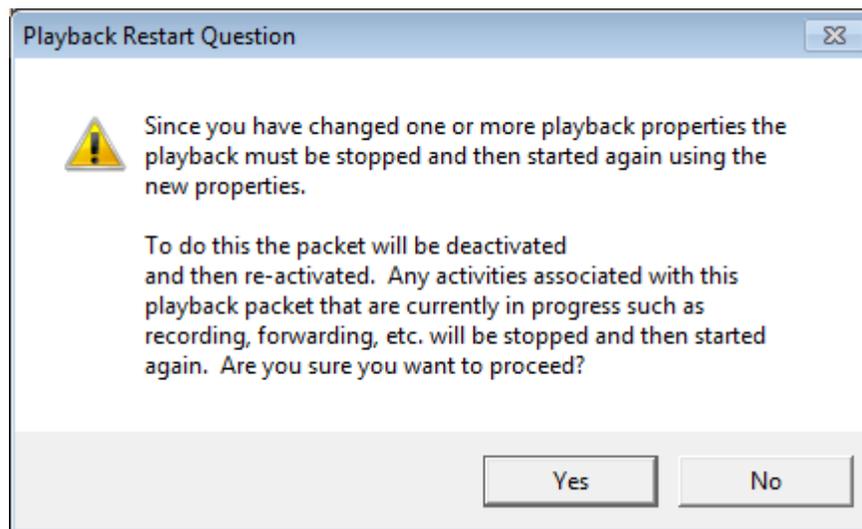
- In the TReK Telemetry Processor, right click on each packet you’d like to begin playback for, and click “Start Playback”. The packet will turn green:



2. In the TReK Telemetry Processor, you may now right click on each packet and choose to pause or stop playback.
3. Note that it doesn't make sense to record playback telemetry, since it has already been recorded!
4. Once the entire playback has finished, the APID will turn puke green:



5. You may change playback parameters (such as playback rate, files, etc.) by double clicking on any APID in the TReK Telemetry Processor to bring up the properties for that playback packet. However, once you change properties, you will be warned by TReK that you must restart playback, and you will be asked to confirm your decision to proceed. Click "Yes". That packet will go back to blue, and playback will need to be restarted by right clicking and choosing "Start Playback" again.



6. You may save your Telemetry Processor set-up (default location is C:\Connect\Trek\configuration\_files\telemetry\_processing) as a \*.tpc file that is readable by TReK Telemetry Processor. This will allow you to save a configuration and recall it later, to playback the same telemetry again at a later date.
7. You may also open existing configuration files for playback by using the “File → Open” menu option in TReK.

## 4.6 Operational Change Requests (OCRs)

The process description for OCRs is found in the Payload Operations Handbook (POH) Volume 2, SOP 10.8 OPERATIONS CHANGE REQUEST PROCESSING via PIMS.

### 4.6.1 Submitting an OCR

An Operations Change Request is used to put in a request to make a change to the preplanned timeline or to request a file uplink to the PLMDM (refer to POH Volume 2 SOP 10.9 OCR GENERATION via PIMS)

1. Select PIMS from the EHS Web Launchpad
2. Select Operations Change Request (OCR)
3. Wait patiently while the window appears

**(PIMS) Operations Change Request (ISS:ULF4:Flight)**

File View Options Help

Filter Find

Priority:  Normal  Urgent

Effectivity:  Permanent for this MOP  Permanent for future MOPs  Temporary

Type:  Standard  Follow Up

CM State: All Active (dropdown) Originator(s): \*

Apply Reset

Filter Results (14)

Job ID	OCR Title	State	Orig	Fac	POIC	Act	Due Date	Due Event	Special Processing
drmcall000044	SDRM Installation of Carou...	POIC Review	S	S	R				
fcoll000171	Update WORF Crew Proced...	Putback to Originator			P				
fcoll000179	Update WORF Crew Proced...	Putback to Originator			P				
fcoll000180	WORF Initial Activation & C...	Final Approval	S		A			After WOR...	
fcoll000182	ER6 & ER2 RIC Release 6 S...	Final Approval	S		A				
fcoll000184	MELFI 3 A&C big picture wo...	Final Approval	S		A		2010 208:08:00:00		
lis1all000334	Voluntary Science Options F...	POIC Review	S		R		2010 208:00:00:00	OCA messa...	
mgolall000149	SAME Planning Changes to ...	POIC Review	S	S	R		2010 207:01:00:00	GMT 209	
mgolall000151	Update 4.003 SAME P-Trak ...	POIC Review	S	S	R				
msg1all000336	MSG Loading Port Stray Lig...	POIC Review	S	S	R			Prior to MS...	
ocpcall000406	Exeutions Suggestions for ...	POIC Review	S		R		2010 207:00:00:00	Before next...	
pom1all000057	MISSE-7 Commanding - GM...	Final Approval	S		A		2010 201:14:00:00	GMT 201	
sthall000110	III F4 Pauload Hazard Contr...	Final Approval	S		A			Prior to nev	

New OCR...

Messages:

4. Select New OCR in the (PIMS) Operations Change Request Window
5. Fill in the information on the main “OCR” page

The screenshot shows a software window titled "(PIMS) New OCR (ISS:009A:Test)". At the top, it displays "Job ID: sam2all000003", "Priority:  Normal  Urgent", and "Special Processing:  Safety Of Flight  Medically Sensitive  Proprietary Sensitive". Below this is a "Title:" text box. A tabbed interface is visible with tabs for "OCR", "Resource Impacts", "Supporting Attachments", "Reviewers", "FYI List", and "CM Log". The "OCR" tab is active, showing fields for "Originator: sam2all0", "Due Event:", "Type:  Standard  Follow Up", "Effectivity:  Permanent for this MOP  Permanent for future MOPs  Temporary", and three date pickers for "Earliest Date:", "Desired Date:", and "Latest Date:". Each date picker has a "None" dropdown and four input boxes for day, month, year, and hour. Below these are two large text areas labeled "Description Of Change:" and "Reason For Change:". At the bottom, there are four buttons: "Save", "Submit", "Withdraw", and "Help".

6. Fill in the appropriate information on the “Resource Impacts” page.

Job ID: sam2all000003    Priority:  Normal    Special Processing:  Safety Of Flight  
 Urgent     Medically Sensitive  
 Proprietary Sensitive

Title:

OCR | Resource Impacts | **Supporting Attachments** | Reviewers | FYI List | CM Log

**Activity/Sequence**

Requirements in iURC

Activity Name:   
Sequence Name:   
Activity Group:   
Sequence Group:   
User Group:   
Crew Time:

**Manual Procedures**

Title:   
Number:   
Filename:

User Validation  
 POIC Verification(Standards)  
 POIC Verification(Non Interference)

**Commanding**

Single Commands  
 Groups  
 Critical  
 Hazardous  
 OIU

**Downlink Data**

Low Rate (<100 Kbps)  
 Medium Rate (<4 Mbps)  
 High Rate (<50 Mbps)  
 Video

**File Uplink Request (to PL MDM)**

Payload Data File(s)  
 Timeliner (UIL) Automated Procedure

Time Needed On-Board:  None  :  :  :

File Size(bytes):   
File Name:

CVT Table  
 RIC Table

Save    Submit    Withdraw    Help

7. Fill in the appropriate information on the “Supporting Attachments” page.

Space Communications and Navigation (SCaN) Testbed Project

Title: SCaN Testbed Console Handbook Volume 1 ISS Interfaces

Document No.: GRC-CONN-OPS-0176 Vol 1

Revision: -

Effective Date: 05/04/2012

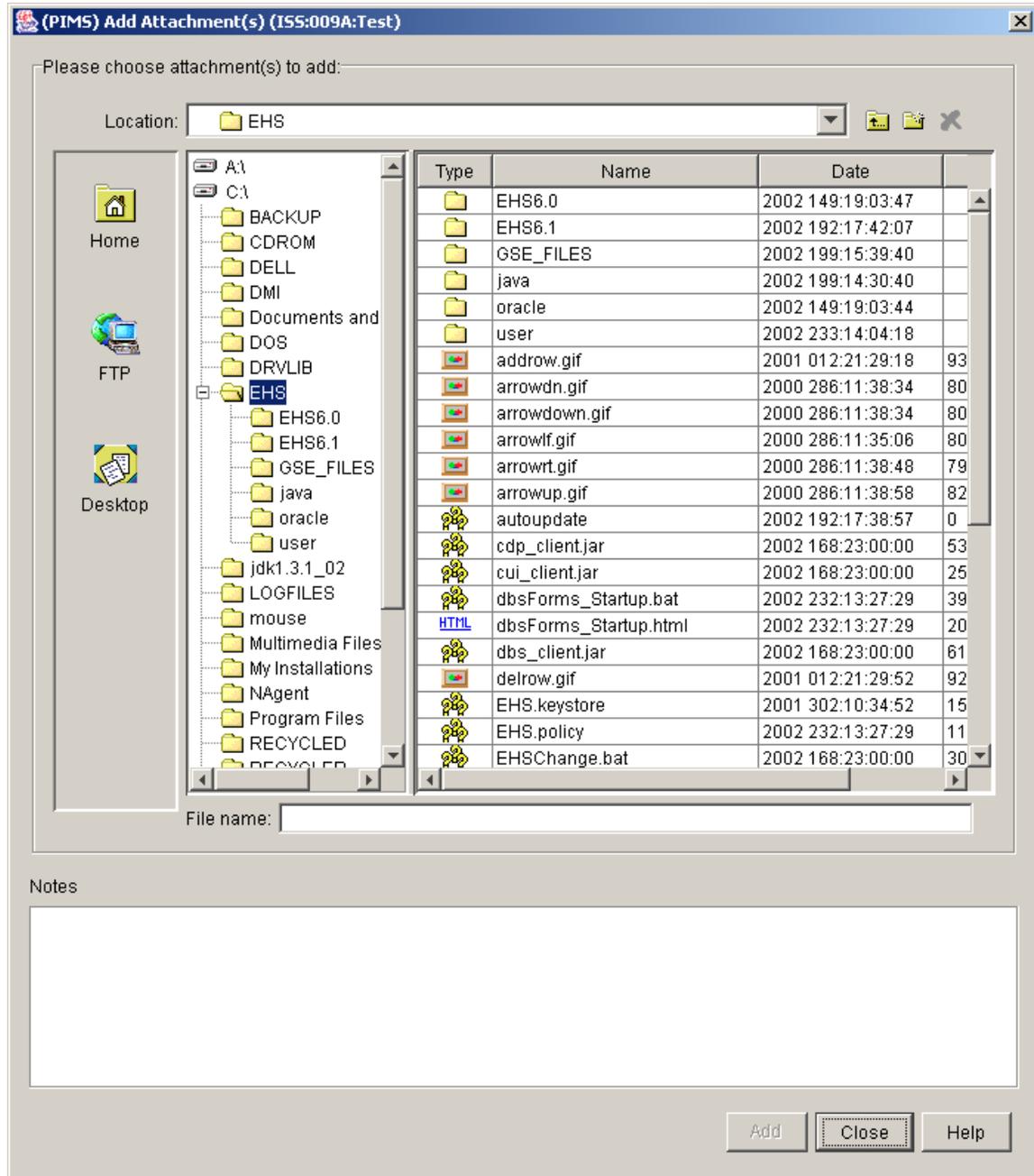
Page 42 of 68

The screenshot shows a software window titled "(PIMS) New DCR (ISS:009A:Test)". At the top, it displays job information: Job ID: sam2all000003, Priority: Normal (selected), and Special Processing options: Safety Of Flight, Medically Sensitive, and Proprietary Sensitive (all unchecked). Below this is a "Title:" text field. A tabbed interface follows, with "Supporting Attachments" selected. Above the main content area are icons for adding (+), searching (magnifying glass), printing (printer), and deleting (X). The main area contains a table with the following structure:

Type	Name	Size	User ID	Notes

At the bottom of the window, there are four buttons: Save, Submit, Withdraw, and Help.

8. To add an attachment, select the yellow plus sign



9. Find and select the file you want to add, and then select the Add Button
10. Select the Close button when you have completed.
11. Fill in the appropriate information on the “FYI List” page.

Space Communications and Navigation (SCaN) Testbed Project

Title: SCAN Testbed Console Handbook Volume 1 ISS Interfaces

Document No.: GRC-CONN-OPS-0176 Vol 1

Revision: –

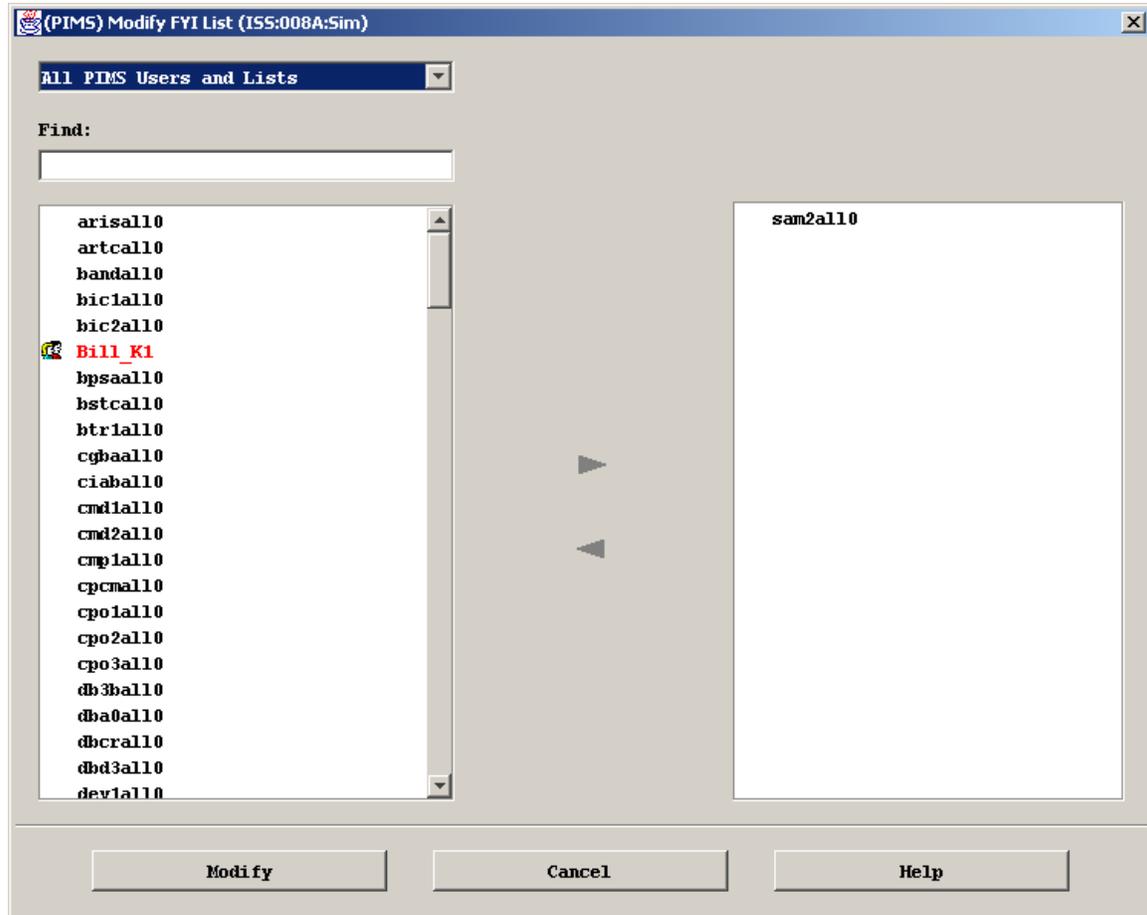
Effective Date: 05/04/2012

Page 44 of 68

The screenshot shows a software window titled "(PIMS) Complete Task (ISS:008A:Sim)". The interface includes the following fields and controls:

- Job ID:** sam2all000001
- Role:** Originator
- Priority:** Radio buttons for Normal (selected) and Urgent.
- Task Description:** Modify Putback OCR
- Title:** test OCR for SRMS for training
- Special Processing:** Checkboxes for Safety Of Flight, Medical Sensitive, and Proprietary Sensitive (all unchecked).
- Navigation Tabs:** OCR, Resource Impacts, Supporting Attachments, Reviewers, FYI List, CM Log.
- Reviewers List:** A central white box containing the text "sam2all0".
- Buttons:** "Modify FYI List..." and "Delete" are located below the reviewers list.
- Footer Buttons:** Save, Submit, Withdraw, Cancel, and Help.

12. The creator of the OCR can add people to be notified when the OCR is out for review. The user should add the scanall0 user to the OCR.
13. Select the “Modify FYI List” button



14. Highlight the user to be notified and select the appropriate arrow to add the user id. Multiple users can be added.
15. Select the Modify button when finished.

#### 4.6.2 Printing an OCR

1. In the Operations Change Request window, select and highlight the OCR to print
2. Select File -> View Printable OCR... from the Operations Change Request window
3. An IE window will appear with the printable OCR
4. Select File -> Print on the IE window
5. Select OK in the Print Window (the file will print in the TSC Room 150)
6. Select File -> Close on the IE window (DO NOT SELECT EXIT)

<b>Space Communications and Navigation (SCaN) Testbed Project</b>		
Title: <b>SCAN Testbed Console Handbook Volume 1 ISS Interfaces</b>	Document No.: <b>GRC-CONN-OPS-0176 Vol 1</b>	Revision: –
	Effective Date: <b>05/04/2012</b>	Page <b>46</b> of 68

### **4.6.3 Reviewing an OCR**

As part of the payload complement of the ISS, SCAN Testbed will be included as reviewers on OCRs submitted by other parties. OCRs that are to be reviewed will appear on the To Do List under PIMS. It is important to keep track of the OCR activity in the console log because the review period could span many days.

The review approach will be as follows. In all cases, be sure to add your initials to the notes section.

- If SCAN has no comments and concurs, then select CONCUR.
- If SCAN has comments that need to be incorporated before concurrence is given, then
  1. Add the comments in the notes section of the OCR, but do NOT concur
  2. Call the owner of the OCR and discuss these comments.
  3. Once the owner attaches a new revision of the procedure in the OCR (probably under reviewers attachments) and we agree, then we will concur with the OCR
  4. If the owner will not put the revised procedure in the OCR, then we will NOT CONCUR with the OCR and state our reasons.
- If SCAN does not concur, then state the reasons why and select NOT CONCUR.

## **4.7 Payload Anomaly Reports (PARs)**

A Payload Anomaly Report is the mechanism which the POIC uses to collect, analyze and track unexpected responses during nominal operations. POH Volume 2 SOP 1.1 PAYLOAD ANOMALY REPORT (PAR) PROCESSING contains the procedure for assigning, processing, and closing a PAR.

PARs are tracked in the Payload Anomaly Log (PAL) which can be found on the RICO webpage. It will be under the Console Logs & Reports pull-down menu (top left of the page) as PAR Log System.

### **4.7.1 Initiating a PAR**

The OC assesses the payload anomaly and assigns a PAR if the signature has not been seen before. Once a PAR number has been assigned, the form needs to be completed. POH Volume 2 SOP 1.2 PAR GENERATION provides the definitions of the required fields in the PAR field.

## 4.8 Console Log

### 4.8.1 Making an Entry

#### 1. Select New Entry

The screenshot displays the CoNNeCT Console Log application. The 'New Entry' button is highlighted with a green circle. The main window shows a table of log entries with columns for Time, Entry #, Description, Person, Category, and SubCategory. Below the table, there is a detailed view of a selected entry for 2011-02-24 055/18:05:58 by Kelly, Eric, categorized as JenTest/JenSub2. The status bar at the bottom indicates 'Entry # 11277 successfully deleted.' and shows the user is logged in as Brown, Helen.

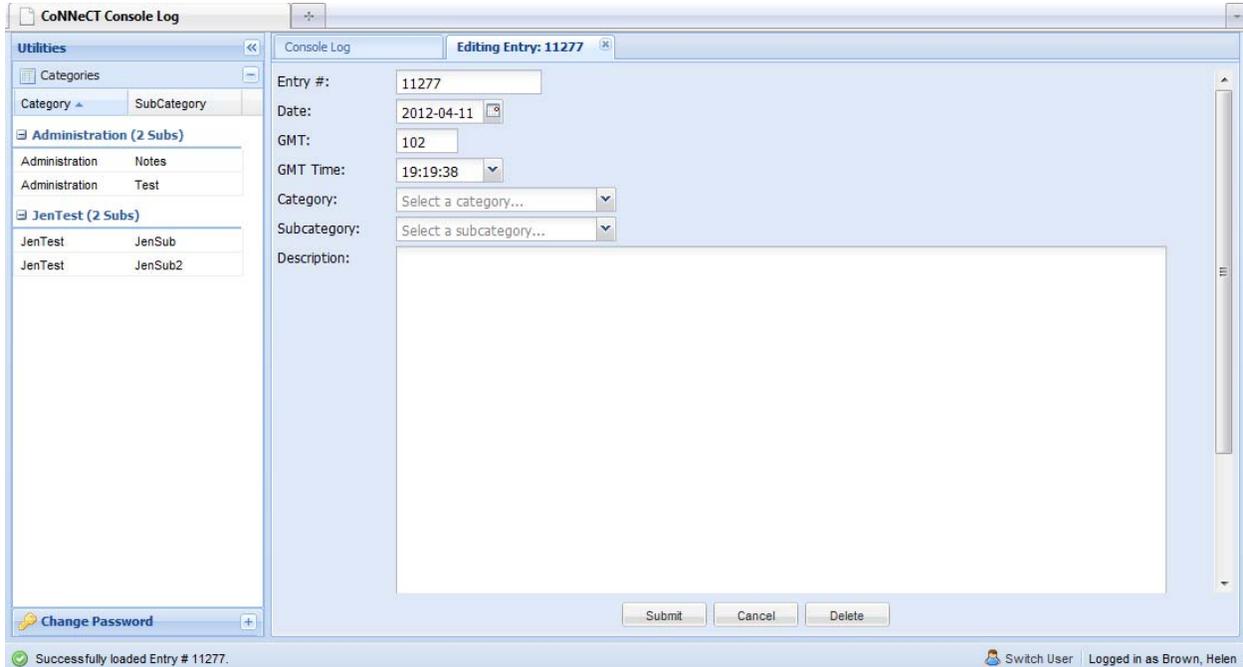
Time	Entry #	Description	Person	Category	SubCategory
2011-02-24 055/18:05:58	11273		Kelly, Eric	JenTest	JenSub2
2011-02-23 054/19:31:35	11271		Kelly, Eric	Administration	Notes

2011-02-24 055/18:05:58  
by Kelly, Eric

Entry #: 11273  
JenTest:JenSub2

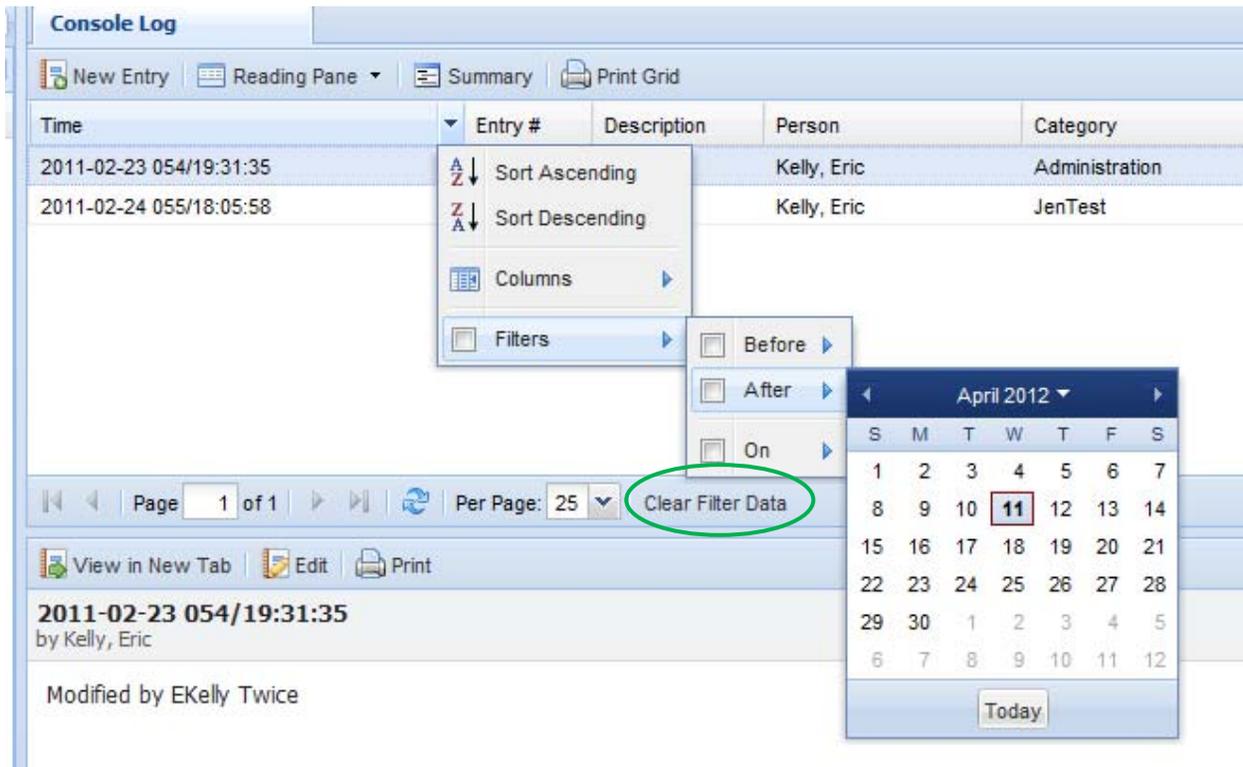
Entry # 11277 successfully deleted. Switch User Logged in as Brown, Helen

2. A new tab opens to edit the entry. The GMT is automatically filled in. If the entry describes an event that has previously happened, the GMT can be changed to reflect the time an event actually occurred. Select the Category and Subcategory, if appropriate, and any explanatory text.
3. Select Submit. If you wish to abort an entry, select Delete. Cancel will not save the text but it will show up in the list of entries.



### 4.8.2 Filtering the Entries

Each of the six headings has a filter tool. It is accessed by selecting the down arrow in the header bar. For example, Time can be filtered by date. Some filters allow a text search. There is a Clear Filter Data to return to the complete entry list.



### 4.8.3 Creating a Report

The list of entries can be printed out by selecting Print Grid. An individual entry can also be printed out by displaying it in the reading pane and selecting Print.

## 4.9 Status Reports

### 4.9.1 Daily Science Report

Each payload is required to submit a daily report to the LIS Representative as described in POH Volume 2 SOP 3.5 User Science Input to LIS Rep. These reports keep the ISS community cognizant of the payloads' status and science accomplishments.

### 4.9.2 Experiment Scorecard

In order to insure that the experimenters' objectives are met during the course of their operations, a scorecard will be developed during their integration process. This will be used to plan operations and to track accomplishments.

Each experimenter will have a distinct scorecard based on their needs. An example of a scorecard follows:

Experiment Description	SDR	RTN/FWD Rate	Completion Date

### 4.10 Video

During the checkout of the SCAN Testbed, video of the gimbal movement will be taken. The method of obtaining this video is not defined at this point. It will likely be available on the Video Asset Management System (VAMS) at the JSC-hosted web site

<http://jsc-isd-vid02.jsc.nasa.gov/screeningroom/explore.asp>

## 5.0 SCHEDULING PROCEDURES

### 5.1 ISS Scheduling

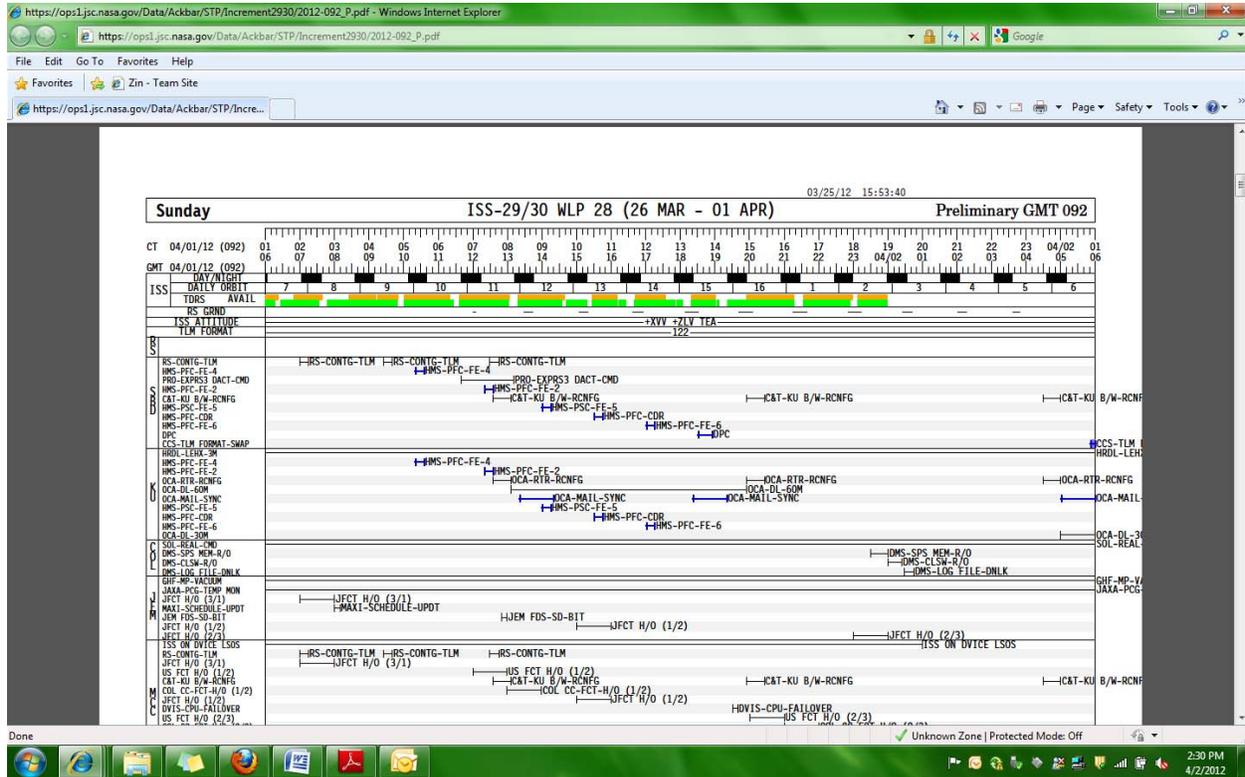
The ISS schedules are kept on a JSC web site called MCC-H Gateway. This gateway provides access to several JSC tools and websites. One of them is called JEDI (Joint Execute Package Development and Integration). It has the current STPs (Short Term Plans), WLPs (Weekly Look Ahead Plans) and Ops Notes.

#### To access JEDI:

1. Log on to MCC-H Gateway (<https://ops1.jsc.nasa.gov/gateway/>)
2. Enter NDC user name and password
3. Click on the blue Planning bar (found in the left column). Then select Current Month

The screenshot shows the ISS Ops1 web application interface. The top navigation bar includes 'ISS Ops1', 'Site: ops1', and 'Vehicle: ISS'. Below this is a header for 'April 2012' with a calendar view. The main content area is a grid showing activities for each day from Monday (02) to Sunday (08). The 'PLANNING' menu on the left is expanded, showing options like 'Current Month', 'Form 24', and 'Gen GR&Cs'. The grid contains various activity codes and descriptions, such as 'ACS-GPS-GATHER' and 'ATV-CARGO-OPS'. A search bar at the bottom indicates a search for 'JOP/FTP Minutes'.

4. For a WLP, click on the word 'metric' underneath the execution week number.
5. For an STP, click on the "i" button next to the GMT of interest.



6. Close all windows when finished

## 5.2 Space Network Scheduling

Refer to GRC-CONN-PLAN-0900 SN-NEN Planning Guide for information on scheduling Space Network Resources.

## 5.3 Near Earth Network

Refer to GRC-CONN-PLAN-0900 SN-NEN Planning Guide for information on scheduling Near Earth Network Resources.

Space Communications and Navigation (SCaN) Testbed Project		
Title: SCAN Testbed Console Handbook Volume 1 ISS Interfaces	Document No.: GRC-CONN-OPS-0176 Vol 1	Revision: –
	Effective Date: 05/04/2012	Page 52 of 68

## **6.0 SHIFT CHANGE PROCEDURES**

### **6.1 Console Log**

Before leaving console, make sure all activities and events from the shift have been properly logged. Make an entry to show the change in personnel.

### **6.2 Debrief Oncoming Shift**

A single debrief with all the positions can be held instead of individual briefings.

#### **6.2.1 Commander Debrief**

The Commander should brief the replacement on flight system status, experiment status, and any outstanding issues.

#### **6.2.2 Controller Debrief**

The Controller should brief the replacement on schedule status, OCRs, PARs, and any outstanding issues.

#### **6.2.3 SFEP Operator Debrief**

The SFEP Operator should brief the replacement on experiment status and any outstanding SN or NEN issues.

#### **6.2.4 APS Logistician Debrief**

The APS Logistician should brief the replacement on upcoming tracking events, file status, and any outstanding issues.

Space Communications and Navigation (SCaN) Testbed Project		
Title: SCAN Testbed Console Handbook Volume 1 ISS Interfaces	Document No.: GRC-CONN-OPS-0176 Vol 1	Revision: –
	Effective Date: 05/04/2012	Page 53 of 68

## 7.0 CONSOLE DEACTIVATION PROCEDURES

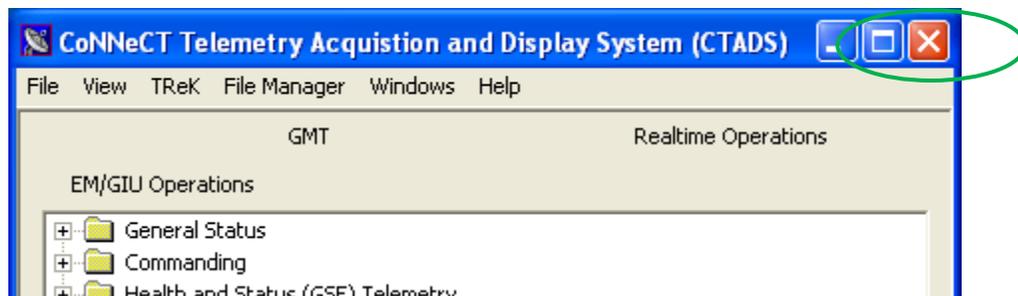
### 7.1 Voice Loops

Contact the OC on the OC loop and inform him/her that SCAN Testbed will be going off console. Also state the expected return GMT for the next operation.

Make sure that each loop is on Monitor Only (yellow light). Do not leave a loop on Talk/Monitor (green light).

### 7.2 Close the CTADS Application

To close CTADS, simply select the exit button. This will close all the open displays and the main CTADS screen.



### 7.3 Close the CTADS Command Processing Software

To close the Command Processing, select the exit button.

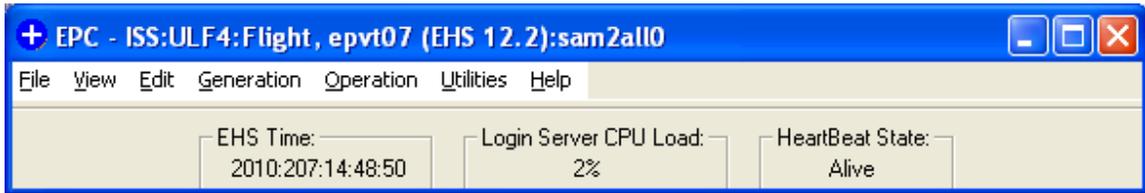
### 7.4 Close the CTADS Telemetry Processing Software

To close the Telemetry Processing, select the exit button.

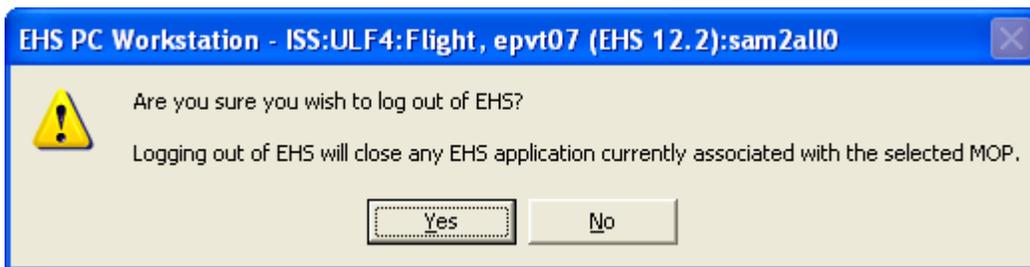
### 7.5 Close the Command Track Application

1. Select File from the applications
2. Select Exit

## 7.6 Log Off of the EPC Launchpad



1. Select File from the EPC launchpad
2. Select Log off and Exit



3. Select the Yes button

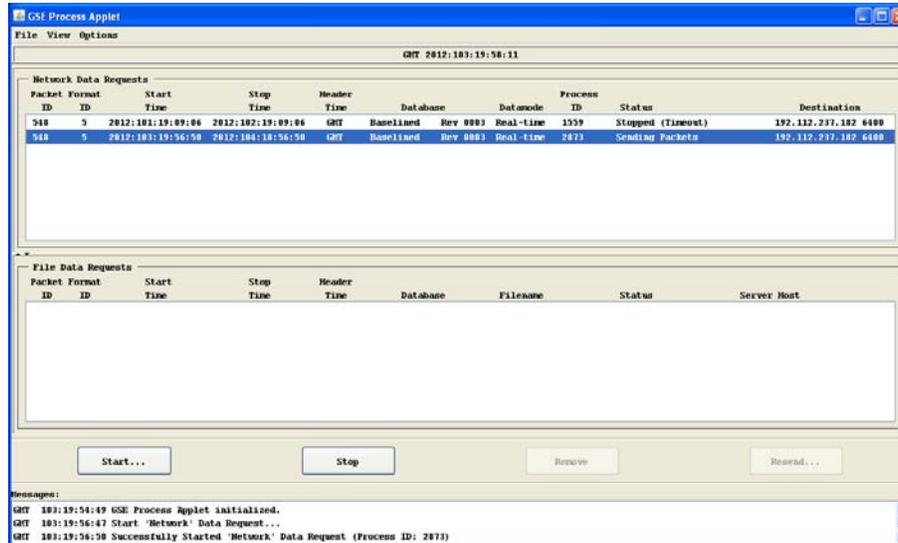
## 7.7 Close the PIMS Applications

The To Do List, Documents, and OCR are all closed the same way.

1. Select File
2. Select Exit

## 7.8 Stop the GSE Packets

1. Select and highlight a packet in the GSE Process Applet Window
2. Select the Stop Button
3. Repeat steps until all packets have been closed
4. Select File and Exit



## 7.9 Log Off of the EHS Web Launchpad

1. Select File from the EHS Web Launchpad
2. Select Logoff
3. Select Yes on the window that appears
4. Once the launchpad disappears, close the Internet Explorer window

## 7.10 Logging Out of the TReK Workstation

1. Close all applications
2. Press CTRL+ALT+DELETE
3. Select Logoff in the Windows 2000 Security Window

## 7.11 Close the Console Log Application

Close the web browser window. Make sure all instances of the browser are closed to ensure an effective log out.

## 7.12 Logging Out of the IDE Workstation

1. Close all applications
2. Select Start on the windows taskbar
3. Select Logoff scanops
4. Select OK

## 8.0 WEB SERVER

SCAN Testbed has an operations website at <http://connect.grc.nasa.gov/> with a secure section. Once logged into the secure site, a portion of the SCAN Testbed data will be accessible. More information can be found in GRC-CONN-PLAN-0130 Data Management Plan.

### 8.1 Flight System Data

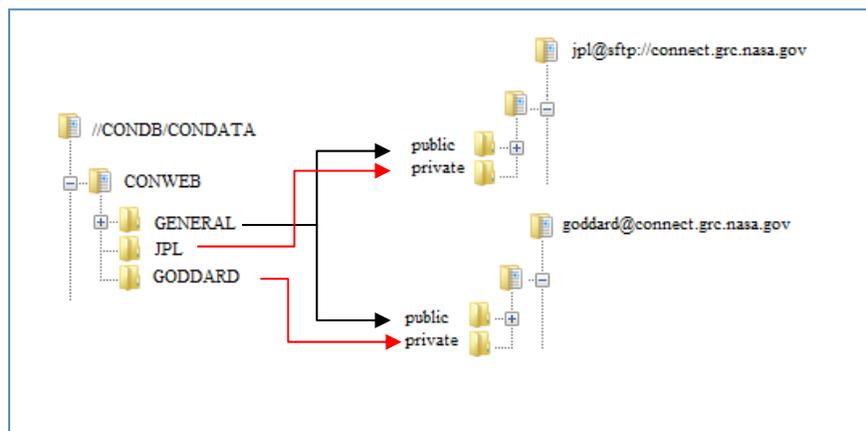
The flight portion of the secure site will display Health and Status data as well as the RTD data. Additionally, there will be a file server to retrieve logs and other files.

### 8.2 Experiment Data

Experiment data is made available to the Experiment Teams through a read-only Secure FTP (SFTP) server on the connect web server, [connect.grc.nasa.gov](http://connect.grc.nasa.gov). Each Experiment Team will be provided with a document describing the data access process

#### 8.2.1 Directory Structure

Experiment data is placed in a web accessible directory on the path //CONDB/Condata/Conweb. Placement of data under a directory named for the Experiment Team (i.e. JPL or GODDARD) designates it for distribution to that Experiment Team. Data placed under a directory called general designates it for distribution to all Experiment Teams. The Experiment Teams will see these directories as **private** and **public**, respectively. Directory structure and files beneath these directories are controlled by the SCAN Testbed Operations Team as needed to meet the data management requirements. The figure below shows the relationship between the public and private directories as seen by the Experiment Teams through SFTP with the data structure on CONDB.



#### 8.2.2 Account Control

Access to the SFTP server is controlled by username and password on a per-team basis. Accounts, initial passwords and home directories are to be setup by the system administrator. Passwords will be known by the SCAN Testbed Operations Team and the respective Experiment Team. Due to the nature of the SFTP server, the SCAN Testbed Operations Team will be responsible for changing and communicating the password to the Experiment Teams. Passwords will expire every 90 days.

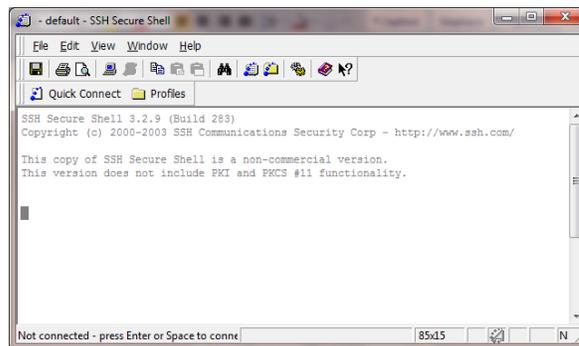
### 8.2.3 Password Reset Procedure

This procedure provides the steps necessary to reset an expired password. If this procedure does not work, contact the System Administrator. The F-SSH Secure Shell Client is available on the TReKs provided at the TSC.

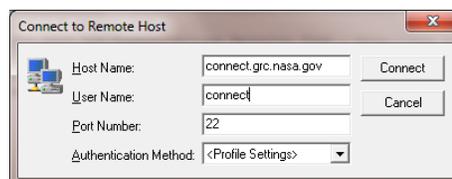
1. Launch F-SSH Secure Shell Client by double clicking on the icon on the desktop.



2. Select the Quick Connect button in the SSH Client window.



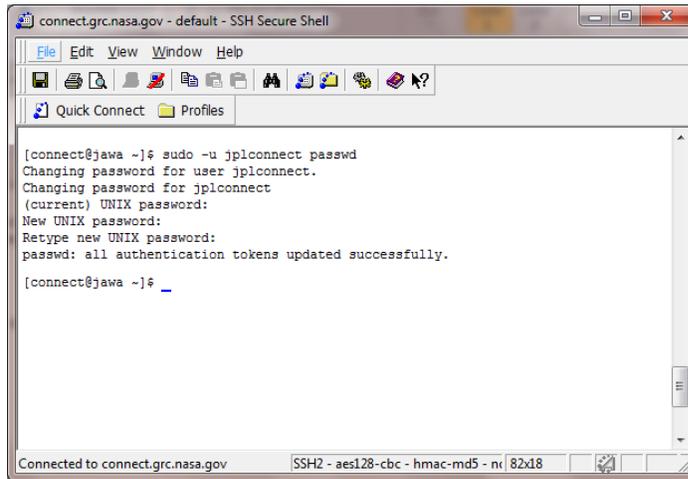
3. Select the Quick Connect button in the SSH Client window. On the Connect to Remote Host window fill in the following 2 fields:
  - i. Field 1 - Hostname: connect.grc.nasa.gov
  - ii. Field 2 – Username: connect



4. Select the Connect button.
5. At the command prompt:

**sudo -u <account> passwd**

Where <account> is the name of the account for the desired Experiment Team.



6. At the (current) UNIX password prompt, type the current password for the Experiment team’s account.
7. At the New UNIX password prompt type a new password, using at least 8 characters with numbers and a special character.
8. At the Retype new UNIX password, type the new password again.
9. Verify the confirmation message: “passwd: all authentication tokens update successfully.”

## 9.0 CONTACTS

### 9.1 SCAN Testbed Team

#### 9.1.1 Ops Team

<b>Name</b>	<b>Work Phone</b>	<b>Cell Phone</b>
Aulisio, Mike	440-863-4377	<TBD-9.1>
Brown, Helen	440-863-4385	440-376-6388
Curtis, Beth	440-863-4382	440-223-5979
Eddy, Wes	216-433-6682	<TBD-9.1>
Norton, Jim	440- 625-2341	<TBD-9.1>
McGiffin, Dan	440-863-4379	<TBD-9.1>
Ponyik, Joe	216-433-8592	<TBD-9.1>
Schrage, Dean	440-863-4384	<TBD-9.1>
Sinacore, Steve	216-433-5443	216-956-4365

#### 9.1.2 Experiment Integration Team

Use the following table if additional information about the experiments is needed

<b>Name</b>	<b>Area</b>	<b>Phone Number</b>
Steve Hall	Lead	216-433-3036
Andrew Sexton	Experiment Liaison	216-433-8223
Al Rybar	GIU Operations	216-433-5343

## 9.2 POIC Cadre Team

The Cadre is normally contacted through the voice loops. However, if a long or complex conversation with a Cadre position is needed, a phone call is the appropriate choice.

### POIC Cadre Position Phone Numbers

<b>CADRE Position</b>	<b>Phone Number</b>	<b>Email address</b>
POD	256-544-6036	<a href="mailto:pod@mps.hosc.msfc.nasa.gov">pod@mps.hosc.msfc.nasa.gov</a>
PRO-1	256-544-6075	<a href="mailto:pro1@mps.hosc.msfc.nasa.gov">pro1@mps.hosc.msfc.nasa.gov</a>
OC	256-544-4614	<a href="mailto:oc@mps.hosc.msfc.nasa.gov">oc@mps.hosc.msfc.nasa.gov</a>
TCO	256-544-7375	<a href="mailto:tco@mps.hosc.msfc.nasa.gov">tco@mps.hosc.msfc.nasa.gov</a>
DMC	256-544-8696	<a href="mailto:dmc@mps.hosc.msfc.nasa.gov">dmc@mps.hosc.msfc.nasa.gov</a>
SAFETY	256-544-9818	<a href="mailto:safety@mps.hosc.msfc.nasa.gov">safety@mps.hosc.msfc.nasa.gov</a>
PPM	256-544-5917	<a href="mailto:ppm@mps.hosc.msfc.nasa.gov">ppm@mps.hosc.msfc.nasa.gov</a>
PSE	256-544-7051	<a href="mailto:pse@mps.hosc.msfc.nasa.gov">pse@mps.hosc.msfc.nasa.gov</a>
RICO	256-544-7715	<a href="mailto:rico@mps.hosc.msfc.nasa.gov">rico@mps.hosc.msfc.nasa.gov</a>
LIS	256-544-7360	<a href="mailto:lis@mps.hosc.msfc.nasa.gov">lis@mps.hosc.msfc.nasa.gov</a>

### HOSC IST Phone Numbers

<b>HOSC IST</b>	<b>Phone Number</b>	<b>Email address</b>
Help Desk (account info)	(256) 544-5066 #1	n/a
MSFC Ops	(256) 544-6145	<a href="mailto:mops@ums.msfc.nasa.gov">mops@ums.msfc.nasa.gov</a>
MSFC Data	(256) 544-2200	<a href="mailto:gnc@ums.msfc.nasa.gov">gnc@ums.msfc.nasa.gov</a>
MSFC Syscon	(256) 544-6139	<a href="mailto:syscon@ums.msfc.nasa.gov">syscon@ums.msfc.nasa.gov</a>
MSFC Comm	(256) 544-6140	<a href="mailto:mops@ums.msfc.nasa.gov">mops@ums.msfc.nasa.gov</a>

### Miscellaneous Number

LIS Daily Science Tag	1-888-830-2916	Passcode: Daily Science Tag Leader Name: changes with the Increment.
-----------------------	----------------	---

### 9.3 GSFC Communication Team

Use the following table if additional information about the SN or NEN network is needed

<b>Position Description</b>	<b>Phone Number</b>
Network Operations Manager (NOM)	<TBD-9.2>
Mission Commitment Engineer (MCE)	<TBD-9.2>
Database Manager	<TBD-9.2>
White Sands Engineer	<TBD-9.2>
Real-time Scheduler	<TBD-9.2>
Forecast Scheduler	<TBD-9.2>
SFEP Engineer	<TBD-9.2>
Flight Dynamics Facility (FDF)	<TBD-9.2>

## 10.0 REFERENCE INFORMATION

### 10.1 Accounts

System	User Name	Password
EDMS	NDC Username	NDC password
EHS Web	scanall0	!Temp12345678
EPC	scanall0	!Temp12345678
CESDB	connect_guest	<TBD- 10.1>
CMTS	Individual Username	Individual password
Connect Console Log	Individual Username	Individual password
CTADS	CoNNeCT	<TBD- 10.2>
IDE computers	NDC Username	NDC password
IVODS	Individual Username	Individual password
MCC-H Gateway	NDC Username	NDC password
OSTPV	Individual Username	Individual password
POIF/RICO	NDC Username	NDC password
TReK	connectops	!Monday1

### 10.2 MOPs and Servers

The server to use for EHS Web is opsweb.tsc.grc.nasa.gov

The server to use for EPC is epvt20b

The MOP to use for flight is ISS: Inc32: Flight

The MOP to use for simulations is ISS: Inc32: Sim

### 10.3 IP Addresses

Each TReK has its own IP address.

Location	TReK	IP address*
Server Room	CONMS	xxx.xxx.xxx.188
Server Room	CONDB	xxx.xxx.xxx.189
STCC Ops	31	xxx.xxx.xxx.184
STCC Ops	33	xxx.xxx.xxx.177
STCC GIU	27	xxx.xxx.xxx.182
STCC GIU	32	xxx.xxx.xxx.176
STEC	29	xxx.xxx.xxx.172
STEC	34	xxx.xxx.xxx.171

\* xxx.xxx.xxx represents the designated subnet for the TSC

### 10.4 Documents

Most of the reference information needed to support operations is contained in binders in the STCC area.

#### 10.4.1 Flight System

The SCaN Testbed documents are contained in the CoNNeCT Configuration Management Tracking System (CMTS), which must be accessed through Internet Explorer. An account is needed to access this secure site.

<https://cmt.grc.nasa.gov/>

SBU documents are contained in eRoom not CMTS.

#### 10.4.2 POIC

The documents controlled by the POIC are contained at the Realtime Information Control Office (RICO) documents web page. These documents include the Payload Operations Handbook, the Payload Regulations, and the Ground Command Procedures. An account is needed to access this secure site.

[https://payloads1.msfc.nasa.gov/station/POIF\\_Masterlist/Realtime\\_Approved\\_Changes.html](https://payloads1.msfc.nasa.gov/station/POIF_Masterlist/Realtime_Approved_Changes.html)

Space Communications and Navigation (SCaN) Testbed Project		
Title: SCAN Testbed Console Handbook Volume 1 ISS Interfaces	Document No.: GRC-CONN-OPS-0176 Vol 1	Revision: –
	Effective Date: 05/04/2012	Page 64 of 68

### 10.4.3 MOD

JSC MOD has created a website that allows access to different mission tools and reference information. The MCC-H Gateway can be reached at the following address. An account is needed to access this secure site.

<https://ops1.jsc.nasa.gov/gateway/>

On the left side of the page, there is a blue bar labeled References. Clicking on this will expand a menu of reference material selections. There are links to the Flight Rules, to the Operations Interface Procedures (OIPs) and to the Operational Control Agreement Database (OCAD)

## APPENDIX A ACRONYMS AND ABBREVIATIONS

### A.1 Scope

This appendix lists the acronyms and abbreviations used in this document.

### A.2 List of Acronyms and Abbreviations

**Table A-1—Acronyms**

AEZ	Allowable Exposure Zone
AFRAM, Active FRAM	Active Flight Releasable Attachment Mechanism
AOS	Acquisition of Signal
APS	Antenna Pointing Subsystem
CoNNeCT	<u>C</u> ommunications, <u>N</u> avigation, and <u>N</u> etworking <u>r</u> e <u>C</u> onfigurabl <u>e</u> <u>T</u> estbed
CTS	Coaxial Transfer Switch
DIO	Digital Input Output
EHOSC	Enhance Huntsville Operations Support Center
ELC	ExPRESS Logistics Carrier
ELC3	ExPRESS Logistics Carrier-3
ELM-ES	Experiment Logistics Module Exposed Section
EP MP	Multi-Purpose Exposed Pallet
ESA	European Space Agency
EVA	Extravehicular Activity
EVR	Extravehicular Robotics
ExPA	ExPRESS Pallet Adapter
ExPCA	ExPRESS Carrier Avionics
FRAM	Flight Releasable Attachment Mechanism
GCE	Gimbal Control Electronics
GD	General Dynamics
GIU	Ground Integration Unit
GPS	Global Positioning System
GRC	Glenn Research Center
GSFC	Goddard Space Flight Center
HC	Harris Corporation
HOSC	Huntsville Operations Support Center
HTV	H-II Transfer Vehicle
ICD	Interface Control Document
IGA	Integrated Gimbals Assembly
ISS	International Space Station
JAXA	Japanese Space Agency
JPL	Jet Propulsion Laboratory
JSC	Johnson Space Center
LOS	Loss of Signal
LVLH	Local Vertical/Local Horizontal
MDM	Multiplexer/Demultiplexer
MSFC	Marshall Space Flight Center
NASA	National Aeronautics and Space Administration

**Space Communications and Navigation (SCaN) Testbed Project**

Title: **SCAN Testbed Console Handbook Volume 1 ISS Interfaces**

Document No.: **GRC-CONN-OPS-0176 Vol 1**

Revision: –

Effective Date: **05/04/2012**

Page **66** of 68

NCR	Non-Compliance Report
NEN	Near Earth Network
NISN	NASA Integrated Services Network
NSTS	National Space Transportation System
OCAD	Operational Control Agreement Document
OE	Operating Environment
OpNom	Operations Nomenclature
Ops	Operations
PD	Payload Developer
PFAP	Passive FRAM Adapter Plate
PFRAM, Passive FRAM	Passive Flight Releasable Attachment Mechanism
PL	Payload
PL MDM	Payload Multiplexer/Demultiplexer
POD	Payload Operations Director
PRO	Payload Rack Officer
RF	Radio Frequency
RTD	Resistance Temperature Detector
SBU	Sensitive But Unclassified
SCaN, SCAN	Space Communications and Navigation
SCANTB	SCaN Testbed
SDR	Software Defined Radio
SN	Space Network
SSP	Space Station Program
SSRMS	Space Station Remote Manipulator System
STCC	SCaN Testbed Control Center
STRS	Space Telecommunications Radio System
SW	Software
TBD	To Be Determined
TBR	To Be Resolved
TDRSS	Tracking and Data Relay Satellite System
TSC	Telescience Support Center
TWTA	Traveling Wave Tube Amplifier
VV	Visiting Vehicle

<b>Space Communications and Navigation (SCaN) Testbed Project</b>		
Title: SCAN Testbed Console Handbook Volume 1 ISS Interfaces	Document No.: <b>GRC-CONN-OPS-0176 Vol 1</b>	Revision: –
	Effective Date: <b>05/04/2012</b>	Page <b>67</b> of 68

## APPENDIX B DEFINITIONS

### B.1 Scope

This appendix lists the definitions used in this document.

### B.2 List of Definitions

**Table B-1—Definitions**

<b>Interface Control Document (ICD):</b> A specification of the mechanical, thermal, electrical, power, command, data, and other interfaces that system elements must meet.
<b>Operations Concept:</b> A concept that defines how the mission will be verified, launched, commissioned, operated, and disposed of. Defines how the design is used to meet the requirements.
<b>Program:</b> A strategic investment by a mission directorate (or mission support office) that has defined goals, objectives, architecture, funding level, and a management structure that supports one or more projects.
<b>Project:</b> (1) A specific investment having defined goals, objectives, requirements, life-cycle cost, a beginning, and an end. A project yields new or revised products or services that directly address NASA's strategic needs. They may be performed wholly in-house; by Government, industry, academia partnerships; or through contracts with private industry. (2) A unit of work performed in programs, projects, and activities.
<b>Success Criteria:</b> Specific accomplishments that must be satisfactorily demonstrated to meet the objectives of a technical review so that a technical effort can progress further in the life cycle. Success criteria are documented in the corresponding technical review plan.
<b>Technology Readiness Level:</b> Provides a scale against which to measure the maturity of a technology. TRLs range from 1, Basic Technology Research, to 9, Systems Test, Launch, and Operations. Typically, a TRL of 6 (i.e., technology demonstrated in a relevant environment) is required for a technology to be integrated into an SE process.

## APPENDIX C    TBDs AND TBRs

### C.1    Scope

This appendix lists all items in this document that need to be determined (TBD) and that need to be resolved (TBR).

### C.2    List of TBDs

**Table C-1—TBDs**

TBD Number	Description	Section Number
9.1	Cell phone numbers of the Ops Team	9.1.1
9.2	Phone numbers of the GSFC Communications Team	9.3
10.1	Password to CESDB	10.1
10.2	Password to CTADS	10.1

### C.3    List of TBRs

**Table C-2—TBRs**

TBR Number	Description	Section Number