

July 30, 1999  
Ref. No.: EOS/ETS-073099-C02

National Aeronautics and  
Space Administration  
Goddard Space Flight Center  
Greenbelt, Maryland 20771

Attention: Mr. Willie Fuller  
Code 581  
Building 32, Room S212D

Subject: Contract No.: NAS9-98100  
CSOC SODA Task Order Number G936  
EOSDIS Test System (ETS) Multimode Portable Simulator for PM-1  
(MPS/PM-1) Delivery of the Release 1.0 Software and Hardware

Dear Mr. Fuller:

We are pleased to deliver Release 1.0 of the ETS Multimode Portable Simulator for PM-1 (MPS/PM-1). This is the first delivery using our new Scalable, Integrated Multimission Simulation Suite (SIMSS) infrastructure and architecture with EOS PM-1 extensions, which we refer to as SIMSS/PM-1 throughout this delivery package. Moving to this new Windows NT PC-based system has resulted in hardware cost savings of nearly \$60,000 per unit.

As per NASA direction, the hardware for the first SIMSS/PM-1 unit has been shipped and is being installed in the Raytheon facility in Denver, Colorado, where it will be used to support PM-1 control center development. ETS personnel are installing the computer there today and will provide user training on the system for Raytheon personnel next week. A second SIMSS/PM-1 system unit will be installed in Building 32 upon your request and once physical location and network arrangements for PM-1 equipment are provided.

More than 50 percent (76 out of 132) of the current SIMSS/PM-1 requirements are partially or fully addressed with this initial release. The remaining requirements will be implemented in subsequent SIMSS/PM-1 releases. A draft copy of the SIMSS/PM-1 User's Guide is being made available to users this week, and an updated copy will be delivered to you next month. We also will plan to make PDF and HTML versions available later from the ETS ([esdis-it.gsfc.nasa.gov/ETS/ets.html](http://esdis-it.gsfc.nasa.gov/ETS/ets.html)) and Simulations Center of Excellence web sites ([cmex.gsfc.nasa.gov](http://cmex.gsfc.nasa.gov)).

This delivery package contains 12 attachments as listed below. A completed Mission Systems Configuration Management (MSCM) form is included in Attachment L. If you have any questions concerning this delivery, please call me at 301-805-3653.

EOSDIS Test System (ETS) Multimode Portable Simulator for PM-1 (MPS/PM-1)  
Delivery of the Release 1.0 Hardware and Software  
July 30, 1999 Ref. No.: EOS/ETS-073099-C02  
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Sincerely yours,

Estelle S. Noone  
CSOC ETS Task Leader

Delivery Package Reviewed and Approved by:

Janice Swope  
CSOC ETS Customer Service Representative

The following attachments contain the details of the MPS software.

- Attachment A - describes the delivery contents for this release
- Attachment B - describes the operational changes
- Attachment C - contains the instructions to build and install the software
- Attachment D - contains any special operating instructions
- Attachment E - contains a list of the resolved DRs
- Attachment F - contains a list of the unresolved DRs
- Attachment G - contains the matrix of requirements addressed by this release
- Attachment H - contains the known system limitations
- Attachment I - contains the release history summary matrix
- Attachment J - contains a listing of the delivery media contents
- Attachment K - contains documentation references
- Attachment L - contains the Mission Systems Configuration Management (MSCM) form

Distribution: (\* - Letter Only)

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Gatto, L. *	Luo, C. *			Fernandes, V. *
Harbaugh, R. *				Gottipamula, A.
Johns, A. *				Noone, E.
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Perkins, D. *				Swope, J. *
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ESDIS Library				Task File

## **Attachment A – Description of Delivery Contents**

The SIMSS/PM1 Release 1.0 consists of hardware and software. The hardware consists of an Intel Pentium III-based Gateway computer, monitor, keyboard, mouse, and internal timing card, as detailed in Attachment J.

The software consists of COTS and custom software executables. The executable is being delivered on one CD-ROM.

A soft copy of the SIMSS/PM1 Release 1.0 delivery package letter and attachments is being delivered. The package attachments have been formatted on a 3.5” IBM PC diskette and were created using the Microsoft Word word processing tool.

## Attachment B – Summary of Operational Capabilities

### **B.1 Operational Capabilities of SIMSS/PM-1 Release 1.0**

#### Telemetry:

- Generate two channels of telemetry formatted as EDOS Data Units (EDUs)
- Start or stop one or both telemetry channels
- Display EDU data
- Reset packet count for one or both telemetry channels
- Provide static packet data (incrementing byte counts)
- Provide capability to overwrite static packet data (by byte location)
- Generate a subset of multiple APIDs (based on list supplied by Raytheon)
- Increment packet sequence counters per APID
- Provide capability to inhibit generation of individual APIDs
- Create telemetry logs (viewable by offline Hexedit program)
- Update packet headers and packet data
- Display packet data in hexadecimal or octal format addressed in either hexadecimal or decimal form
- Reset Packet Sequence Counters
- Modify Packet Sequence Counters
- Modify Packet Version field
- Modify Packet Type field
- Modify Packet SH Flag field
- Modify Packet Length field
- Modify CUC
- Control packet transmission rate

#### Command:

- Ingest type AD, BC, and BD commands
- Display Total CLTUs count
- Reset Total CLTUs count
- Display Rejected CLTUs count
- Reset Rejected CLTUs count
- Display Instrument commands count
- Reset Instrument commands count
- Display Spacecraft commands count
- Reset Spacecraft commands count
- Display BC commands count
- Reset BC commands count
- Display BD commands count
- Reset BD commands count
- Display current Spacecraft CLCW
- Display current Instrument CLCW

- Validate commands based on individual, all, or none of the following validation criteria: CLTU Start and Tail Sequences, BCH Error Code, Transfer Frame Header Fields, FARM (Valid Frame Sequence), User Command Packet Header
- Generate event messages based on ingest
- Log raw commands (viewable by offline Hexedit program)
- Display raw command in hexadecimal or octal format addressed in either hexadecimal or decimal form

Time:

- Maintain and update spacecraft (SC) time (GIRD)
- Maintain and update GMT time
- Synchronize SC and GMT times

## Attachment C – Release 1.0 Installation Instructions

SIMSS/PM-1 Release 1 consists of sever-side and client-side executables, collectively referred to as NeTT Server and NeTT Client. Instructions for installing the NeTT Server and NeTT Client are as follows:

1. Insert delivery media into appropriate drive.
2. Go to the files on the installation media:
  - a) On the desktop, click on the Start button, and then select Run from resulting menu.
  - b) When the Run window appears select the Browse... button.
  - c) From the Browse Window, Select the Removable drive that contains the installation disk.
  - d) Three folders are then shown for the installation media: client, server and JDK.
3. To install the NeTT Client:
  - a) Click on the client folder.
  - b) From within the client folder, double click on the Setup icon.
  - c) The screen will be filled with a NeTT Client background and a smaller window with the title “Welcome to NeTT Client” will appear. Click on the Next button to proceed to the next step.
  - d) The next window will contain the licensing agreement. Click on Yes to accept the agreement and proceed.
  - e) After all of the files are copied, a window with the title “Setup Complete” will appear. Click on the Finish button to end.
  - f) A NeTT Client icon should now be installed on the desktop.
4. To install the NeTT Server:
  - a) Click on the server folder.
  - b) From within the server folder, double click on the Setup icon.
  - c) A window with the title “Run Window” will appear. Click on the Okay button to proceed to the next step.
  - d) The screen will then be filled with a NeTT Server background and a window with the title of “Welcome to NeTT Server” will appear. Click the Next button to proceed.
  - e) A window with the title “Choose Destination” will appear. Click on the Next button to proceed.
  - f) Then a window with the title “Select Components” will appear. By default all of the components have check marks. Click on the Next button.
  - g) Next a window will show the completion status as the files are copied. When the copying is complete click on the Next button to finish the installation.
  - h) A NeTT Server icon will be installed on the desktop.

## **Attachment D – Special Operating Instructions**

Standard operating procedures are included in the System User's Guide for the SIMSS/PM-1 Simulator, Release 1.0.

The current SIMSS/PM-1 implementation requires Microsoft Visual C++ be installed for proper execution and Microsoft Access for system event logging.

## **Attachment E – Resolved Discrepancy Reports**

Since this is the first delivery of SIMSS/PM-1, there were no open Discrepancy Reports (DRs) on the system, and there were no DRs resolved in SIMSS/PM-1 Release 1.0.

## Attachment F - Unresolved Discrepancy Reports

SIMSS/PM-1 Release 1.0 test verification generated three new Discrepancy Reports (DRs). The DRs have been entered for the ETS Project into the ESDIS Discrepancy Report Tracking Tool (DRTT). Information on all DRs can be accessed via the Internet at address <http://iree.gsfc.nasa.gov/ddts/> (directly) or from the ESDIS Integration and Test home page at <http://esdis-it.gsfc.nasa.gov/>. The following tables represent a summary of the open DRs. The unresolved DRs are listed in the table below by Number, Status, Severity, System/Subsystem name, Description, and Related NCR number. A full description of each DR follows the summary tables.

### Summary of Open Discrepancy Reports

Release	Critical(1)	Urgent(2)	Routine(3)	Totals
New in 1.0	0	3	0	3

### Status Definitions

N - New	A - Assigned Analysis	R - Assigned Resolution
D - Delivered	V - Verified	C - Closed
W - Withdrawn	P - Postponed	X - Duplicate

DR #	Status	Severity	Subsystem	Description	Related NCR
*ETS-PM-1	N	2	MPS-PM1	Data transmit rate of zero causes abnormal termination	
*ETS-PM-2	N	2	MPS-PM1	Invalid IP address and port settings causes abnormal termination	
*ETS-PM-3	N	2	MPS-PM1	Extended period of operation occasionally causes abnormal termination	

\* DRTT was not available at time of system delivery to enter these DRs against MPS-PM1. Once the DRs are officially entered into DRTT, an amended Attachment F with DR numbers assigned will be provided.

**DR: ETS-PM-1**

**Related NCR:**

**Submitted:**

**Status: NEW**

**Class: ETS**

**Assigned-Analysis:**

**Title: Data transmit rate of zero causes abnormal termination**

The telemetry transmit rate can be set to zero. The system will terminate abnormally when the rate is set to zero.

As a workaround, for this release, use the default rates set up for each APID. Do not set to zero.

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**DR: ETS-PM-2**

**Related NCR:**

**Submitted:**

**Status: NEW**

**Class: ETS**

**Assigned-Analysis:**

**Title: Invalid IP address and port settings causes abnormal termination**

Invalid IP address and port settings will cause the system to terminate abnormally

As a workaround for this release, check with system administrator and use only valid IP addresses and port numbers.

.....

**DR: ETS-PM-3**

**Related NCR:**

**Submitted:**

**Status: NEW**

**Class: ETS**

**Assigned-Analysis:**

**Title: Extended period of operation occasionally causes abnormal termination**

When left running for an extended period of time, the system will eventually terminate abnormally.

As a workaround for this release, reset the computer and bring the simulator back up.

**DR: ETS-PM-1**  
**Status: NEW**

**Related NCR:**  
**Class: ETS**

**Submitted:**  
**Assigned-Analysis:**

**Title: Data transmit rate of zero causes abnormal termination**

The telemetry transmit rate can be set to zero. The system will terminate abnormally when the rate is set to zero.

As a workaround, for this release, use the default rates set up for each APID. Do not set to zero.

.....

**DR: ETS-PM-2**  
**Status: NEW**

**Related NCR:**  
**Class: ETS**

**Submitted:**  
**Assigned-Analysis:**

**Title: Invalid IP address and port settings causes abnormal termination**

Invalid IP address and port settings will cause the system to terminate abnormally

As a workaround for this release, check with system administrator and use only valid IP addresses and port numbers.

.....

**DR: ETS-PM-3**  
**Status: NEW**

**Related NCR:**  
**Class: ETS**

**Submitted:**  
**Assigned-Analysis:**

**Title: Extended period of operation occasionally causes abnormal termination**

When left running for an extended period of time, the system will eventually terminate abnormally.

As a workaround for this release, reset the computer and bring the simulator back up.

## Attachment G – Requirements Matrix

<b>Requirement Specification</b>	<b>Requirement Description</b>	<b>Compliance (Full/Partial/None)</b>	<b>Comment</b>
	The SIMSS/PM-1 GUI and simulator shall be year 2000 compliant.	F	
PMCMD-01	SIMSS/PM-1 shall be capable of selecting a desired version of the PDB at operator request during initialization.	N	
PMCMD-01.1	An operator shall place all current versions of the PDB files in a predefined location in the file system and shall remove all outdated versions of the PDB files from that location.	N	
PMCMD-02	SIMSS/PM-1 shall execute directives that start and stop logging of commands.	F	
PMCMD-03	SIMSS/PM-1 shall execute commands that enable or disable any element of the command validation process.	P	The operator can set validation flags for headers.
PMCMD-03.1	The command subsystem shall query an external interface to determine which elements of command validation are enabled.	F	This requirement is based upon the operator selected validation flags.
PMCMD-03.2	The command subsystem shall validate the command elements if validation is enabled. The command validation elements are CLTU start and tail sequence validation, Codeblock BCH Parity validation, Transfer frame header validation, FARM Protocol validation and User command Packet header validation.	P	The User Command Packet Header validation is not implemented.
PMCMD-03.3	When the CLTU Start and Tail sequences validation element is enabled, the command subsystem will verify that the CLTU's 16 bit start and 64 bit tail sequences match the values defined in the ICD. When this element is disabled, the start and tail sequences are ignored. If this CLTU validation fails, an event message will be generated and the entire CLTU will be discarded.	F	
PMCMD-03.4	When the codeblock BCH parity validation element is enabled, the command subsystem will verify that the BCH parity byte matches a computed value and that the spare bit is equal to zero. When this element is disabled, the parity byte is assumed to be valid. If any codeblock of a CLTU fails validation, an event message will be generated and the entire CLTU will be discarded. The BCH parity calculation is the same as for the EOS AM-1 spacecraft.	F	
PMCMD-03.5	When the Transfer Frame Header validation element is enabled, the command subsystem will verify that all of the fields of the Transfer Frame Header except the sequence number match expected values and ranges as defined in the ICD. When this element is disabled, the Transfer Frame Header values are assumed to be valid. If the Transfer Frame Header validation fails, an event message will be generated and the entire Transfer Frame will be discarded. If applicable, the CLCW for the Transfer Frame's virtual channel will also be updated with error information.	F	
PMCMD-03.6	When the FARM validation element is enabled, the command subsystem will verify that the Transfer	P	CLCW is not sent in telemetry.

## Attachment G – Requirements Matrix

Requirement Specification	Requirement Description	Compliance (Full/Partial/None)	Comment
	Frame sequence number is valid as expected for FARM-1 protocol as defined in the ICD. When this element is disabled, the Transfer Frame sequence number is assumed to be valid. If the FARM validation fails, an event message will be generated, the appropriate CLCW will be updated and the entire Transfer Frame will be discarded.		
PMCMD-03.7	When the Command Packet Header validation element is enabled, the command subsystem will verify that the Command Packet Header fields are as defined in the ICD. When this element is disabled, the Command Packet Header is assumed to be valid. If the Command Packet Header validation fails, an event message will be generated and the Command Packet will be discarded. Currently there is a spacecraft telecommand packet format and an instrument command packet format.	N	
PMCMD-04	SIMSS/PM-1 shall execute command directives that override the CLCW.	N	
PMCMD-05	SIMSS/PM-1 shall provide the capability to respond to that subset of spacecraft commands that are defined in the PM-1 PDB End item verifiers file.	N	
PMCMD-05.1	The command subsystem shall match a received command bit pattern to a command mnemonic in the PDB. Based on the command mnemonic, an end-item verifier telemetry mnemonic and value will be found in PDB information. If an end-item verifier telemetry mnemonic is found, it will be set to the PDB defined value.	N	
PMCMD-06	SIMSS/PM-1 shall simulate spacecraft command acceptance according to the COP-1 protocol.	P	CLCWs are not returned in telemetry.
PMCMD-06.1	SIMSS/PM-1 shall perform type AD spacecraft acceptance checks in accordance with the FARM-1 protocol if FARM-1 protocol checking is enabled.	F	
PMCMD-06.1.1	SIMSS/PM-1 shall reject type AD spacecraft commands and post a command rejected event message if the lockout bit is set in the spacecraft CLCW.	F	
PMCMD-06.01.2	SIMSS/PM-1 shall reject type AD spacecraft commands, post a command rejected message, and set the lockout bit in the spacecraft CLCW if (1) the frame sequence count in the transfer frame header is more than 90 counts greater than or more than 90 counts less than (modulo 256) the Report Value field of the spacecraft CLCW <u>and</u> (2) FARM-1 protocol checking is enabled.	F	
PMCMD-06.01.3	SIMSS/PM-1 shall reject type AD spacecraft commands, post a command rejected message, and set the Retransmit bit in the spacecraft CLCW if (1) the frame sequence count in the transfer frame header is between one and 89 counts greater than (modulo 256) the contents of the Report Value field of the spacecraft CLCW <u>and</u> (2) FARM-1 protocol checking is enabled.	F	
PMCMD-06.01.4	SIMSS/PM-1 shall reject type AD spacecraft	F	

## Attachment G – Requirements Matrix

Requirement Specification	Requirement Description	Compliance (Full/Partial/None)	Comment
	commands and post a command rejected message if (1) the Frame Sequence count in the transfer frame header is between one and 90 counts less than (modulo 256) the contents of the Report Value field of the spacecraft CLCW and (2) FARM-1 protocol checking is enabled.		
PMCMD-06.01.5	SIMSS/PM-1 shall clear the spacecraft CLCW Lockout bit upon receipt of an UNLOCK Control Command (Type BC) containing the spacecraft VCID.	F	
PMCMD-06.01.6	SIMSS/PM-1 shall set the spacecraft CLCW Report Value field to the data value contained within the third byte of a SET V(R) Control Command (Type BC) containing the spacecraft VCID.	F	
PMCMD-06.01.7	SIMSS/PM-1 shall increment the Report Value field (modulo 256) of the spacecraft CLCW upon receipt of a type AD spacecraft command whose Frame Sequence Count matches the current spacecraft CLCW Report Value field contents, providing that FARM-1 protocol checking is enabled.	F	
PMCMD-06.02	SIMSS/PM-1 shall perform type AD instrument command acceptance checks in accordance with the FARM-1 protocol if FARM-1 protocol checking is enabled.	F	
PMCMD-06.02.1	SIMSS/PM-1 shall reject type AD instrument commands and post a command rejected event message if the Lockout bit is set in the instrument CLCW.	F	
PMCMD-06.02.2	SIMSS/PM-1 shall reject type AD instrument commands, post a command rejected message, and set the Lockout bit in the instrument CLCW if (1) the Frame Sequence count in the transfer frame header is more than 90 counts greater than or more than 90 counts less than (modulo 256) the Report Value field of the instrument CLCW <u>and</u> (2) FARM-1 protocol checking is enabled.	F	
PMCMD-06.02.3	SIMSS/PM-1 shall reject type AD instrument commands, post a command rejected message, and set the Retransmit bit in the instrument CLCW, if (1) the Frame Sequence count in the Transfer Frame header is between one and 90 counts greater than (modulo 256) the report Value field of the instrument CLCW <u>and</u> (2) FARM-1 protocol checking is enabled.	F	
PMCMD-06.02.4	SIMSS/PM-1 shall reject type AD instrument commands, post a command rejected message if (1) the Frame Sequence count in the Transfer Frame header is between one and 89 counts greater than (modulo 256) the report Value field of the instrument CLCW <u>and</u> (2) FARM-1 protocol checking is enabled.	F	
PMCMD-06.02.5	SIMSS/PM-1 shall clear the instrument CLCW Lockout bit upon receipt of an UNLOCK Control command (type BC) containing the instrument VCID.	F	
PMCMD-06.02.6	SIMSS/PM-1 shall set the instrument CLCW Report Value field to the data value contained within the third byte of a SET V(R) Control Command (type BC) containing the instrument VCID.	F	

## Attachment G – Requirements Matrix

<b>Requirement Specification</b>	<b>Requirement Description</b>	<b>Compliance (Full/Partial/None)</b>	<b>Comment</b>
PMCMD-06.02.7	SIMSS/PM-1 shall increment the Report Value field (modulo 256) of the instrument CLCW upon receipt of a type AD instrument command whose Frame Sequence count matched the current instrument CLCW Report Value field contents, providing that FARM-1 protocol checking is enabled.	F	
PMCMD-07	SIMSS/PM-1 shall provide the capability to read and interpret flags in spacecraft command headers.	P	The flags in the secondary header are not checked. Packet sequence processing is not implemented for this release.
PMCMD-08	SIMSS/PM-1 shall provide the capability to validate all headers of received data.	P	This requirement will be refined.
PMCMD-09	SIMSS/PM-1 shall provide the capability to monitor and display command processing status.	P	
PMCMD-10	SIMSS/PM-1 shall store received commands for posttest review subject to specified storage capacities.	P	Event messages are logged.
PMCMD-11	SIMSS/PM-1 shall simulate spacecraft command validation processing using information from the PDB.	N	
PMCMD-12	SIMSS/PM-1 shall generate a simulator event message whenever a valid command is received.	P	The PDB must be supplied to complete implementation.
PMCMD-13	SIMSS/PM-1 shall generate a simulator event message whenever a command error is detected.	P	The PDB must be supplied to complete implementation.
PMCMD-14	SIMSS/PM-1 shall provide the capability to verify the received EOS spacecraft commands by updating the two command link control words (CLCW).	P	The CLCWs are not transmitted in telemetry.
PMCMD-15	SIMSS/PM-1 shall execute directives that configure command processing for IP mode.	F	
PMCMD-16	SIMSS/PM-1 shall execute directives that set the expected values within the Command Data Block (CDB) header.	N	
PMCMD-17	SIMSS/PM-1 shall be capable of receiving command data as UDP command blocks.	F	
PMCMD-18	SIMSS/PM-1 shall be capable of receiving command data blocks.	F	
PMCMD-19	SIMSS/PM-1 shall receive spacecraft and memory loads and shall store the load data in the simulated memory.	N	
PMCMD-20	SIMSS/PM-1 shall perform a CRC validation in the load data and shall set a pass/fail indicator in telemetry.	N	
PMCMD-21	SIMSS/PM-1 shall process commands that request or configure for a Spacecraft Controller Computer memory dump.	N	
PMCMD-22	SIMSS/PM-1 interface with the EOC shall comply with the command interface formats and protocols specified in the EDOS to EGS Elements Interface document.	F	
PMCMD-23	SIMSS/PM-1 shall update multiple command counters.	N	
PMCMD-24	SIMSS/PM-1 shall interpret both VCID 0 and VCID 1 commands.	N	
PMCMD-25	SIMSS/PM-1 shall interpret multipart commands.	N	
PMGUI-01	The SIMSS/PM-1 GUI shall accept and validate all operator directives.	P	All defined directives have been implemented.
PMGUI-02	The SIMSS/PM-1 GUI shall build and forward	F	

## Attachment G – Requirements Matrix

<b>Requirement Specification</b>	<b>Requirement Description</b>	<b>Compliance (Full/Partial/None)</b>	<b>Comment</b>
	simulation configuration commands that set spacecraft time and GMT.		
PMGUI-03	The SIMSS/PM-1 GUI shall build and forward simulation configuration commands that configure command processing for IP mode.	F	
PMGUI-04	The SIMSS/PM-1 GUI shall build and forward simulation configuration commands that enable or disable any element of command validation.	F	
PMGUI-05	The SIMSS/PM-1 GUI shall build and forward simulation configuration commands that set the CLCW.	N	
PMGUI-06	The SIMSS/PM-1 GUI shall build and forward simulation configuration commands that configure telemetry processing for IP mode.	F	
PMGUI-07	The SIMSS/PM-1 GUI shall build and forward simulation configuration commands that set packet intervals for all real-time telemetry.	F	
PMGUI-08	The SIMSS/PM-1 GUI shall build and forward simulation configuration commands to start and stop telemetry transmission.	F	
PMGUI-09	The SIMSS/PM-1 GUI shall build and forward simulation configuration commands that set values of telemetry parameters (based on mnemonic).	N	
PMGUI-10	The SIMSS/PM-1 GUI shall accept directives that result in erroneous telemetry header values.	F	
PMGUI-11	The SIMSS/PM-1 GUI shall build and forward simulation configuration commands to turn on and off selected orbit modeling.	N	Modeling requirement TBD
PMGUI-12	The SIMSS/PM-1 GUI shall build and forward simulation configuration commands to change between static, table or algorithm models.	N	Modeling requirement TBD
PMGUI-13	Creation of simulation timelines (scenario files) shall be performed offline via a text editor.	N	
PMGUI-14	Execution of a simulation timeline results in TBD directives being sent to the SIMSS/PM-1 simulator.	N	
PMGUI-15	The SIMSS/PM-1 GUI shall build and forward simulation configuration commands to start and stop logging of commands.	F	
PMGUI-16	The SIMSS/PM-1 GUI shall build and forward display requests for all EDOS telemetry status displays.	F	
PMGUI-17	The SIMSS/PM-1 GUI shall provide at least one status display to the operator, showing key information about the configuration of the simulator.	F	
PMGUI-18	The SIMSS/PM-1 GUI shall provide the capability to display command packets received to the operator.	F	
PMGUI-19	The SIMSS/PM-1 GUI shall build and forward simulation configuration commands to start and stop logging of telemetry.	F	
PMGUI-20	The SIMSS/PM-1 GUI shall provide the capability to display telemetry packets and EDUs transmitted, to the operator.	F	
PMGUI-21	The SIMSS/PM-1 GUI shall update the telemetry and command status for display periodically, as required.	F	

## Attachment G – Requirements Matrix

<b>Requirement Specification</b>	<b>Requirement Description</b>	<b>Compliance (Full/Partial/None)</b>	<b>Comment</b>
PMGUI-22	The SIMSS/PM-1 GUI shall provide the capability to display the current network and multicast configuration to the operator.	P	
PMGUI-23	SIMSS/PM-1 shall execute directives that set spacecraft time and GMT.	F	
PMGUI-24	The SIMSS/PM-1 GUI shall build and forward simulation configuration commands to set the IP address and port numbers.	F	
PMGUI-25	SIMSS/PM-1 shall display GMT and spacecraft times.	F	
PMGUI-26	SIMSS/PM-1 shall display EDOS Service Header.	N	
PMGUI-27	SIMSS/PM-1 shall display Telemetry packet header.	F	
PMGUI-28	SIMSS/PM-1 shall display event messages.	F	
PMGUI-29	SIMSS/PM-1 shall display CLCW.	F	
PMGUI-30	SIMSS/PM-1 shall display mnemonic of command received.	N	
PMGUI-31	SIMSS/PM-1 shall display telemetry status.	F	
PMGUI-32	SIMSS/PM-1 shall display command status.	F	
PMTLM-01	SIMSS/PM-1 shall execute directives that start and stop logging of telemetry.	F	
PMTLM-02	SIMSS/PM-1 shall execute directives that configure the transmission of telemetry.	N	
PMTLM-03	SIMSS/PM-1 shall execute directives that set packet generation rates for all real-time APIDs generated by the PM-1 spacecraft.	P	PDB must be supplied for full implementation of this requirement.
PMTLM-04	SIMSS/PM-1 shall execute directives that set the value of any telemetry parameter by mnemonic.	N	
PMTLM-05	SIMSS/PM-1 shall execute directives that set the value of any location in the PM-1 simulated spacecraft memory.	N	
PMTLM-06	SIMSS/PM-1 shall execute directives that request the value of any telemetry parameter for display in raw data.	N	
PMTLM-07	SIMSS/PM-1 shall execute console directives that request the contents of any telemetry packet.	N	
PMTLM-08	SIMSS/PM-1 shall execute telemetry directives that request the value of any location or block of locations in spacecraft memory.	N	
PMTLM-09	SIMSS/PM-1 shall set initial telemetry parameter values from information extracted from the PDB and user provided files.	N	
PMTLM-10	SIMSS/PM-1 shall execute telemetry directives that control the PM-1 Solid State Recorder pointers.	N	
PMTLM-11	SIMSS/PM-1 shall provide the capability to insert simulated time codes in telemetry packet headers.	F	
PMTLM-12	SIMSS/PM-1 shall provide for the storage of telemetry to be used as playback data.	N	
PMTLM-13	SIMSS/PM-1 shall provide the capability to generate and transmit telemetry using APIDS identical to the PM-1 spacecraft.	P	PDB must be supplied for full implementation of this requirement.
PMTLM-14	SIMSS/PM-1 shall format telemetry parameters into	N	

## Attachment G – Requirements Matrix

<b>Requirement Specification</b>	<b>Requirement Description</b>	<b>Compliance (Full/Partial/None)</b>	<b>Comment</b>
	packets as specified in the PM-1 PDB packet definitions for S-band telemetry.		
PMTLM-15	SIMSS/PM-1 shall provide the capability to insert fill data into generated test data.	N	
PMTLM-16	SIMSS/PM-1 shall send out telemetry packets at specified intervals of spacecraft time. These intervals shall be as defined for each APID by the PDB and shall be modifiable by the operator.	P	PDB must be supplied for full implementation of this requirement
PMTLM-17	SIMSS/PM-1 shall be capable of setting values into fields of telemetry packet headers.	N	
PMTLM-18	SIMSS/PM-1 shall provide the capability to transmit up to two streams of telemetry.	F	
PMTLM-19	SIMSS/PM-1 shall execute telemetry directives that start and stop the transmission of data.	F	
PMTLM-20	SIMSS/PM-1 shall generate EDUs and EDOS data headers based on the User Datagram Protocol (UDP) format definitions.	F	
PMTLM-21	SIMSS/PM-1 shall be capable of simulating memory dumps. SIMSS/PM-1 shall build packets based on the contents of simulated memory.	N	
PMTLM-22	SIMSS/PM-1 shall provide the capability to simulate EOS PM-1 low-rate spacecraft return-link data.	P	PDB must be supplied for full implementation of this requirement.
PMTLM-23	SIMSS/PM-1 shall allow modification of any field within the EDOS data header.	N	
PMTLM-24	SIMSS/PM-1 shall provide the capability of transmitting the CLCW in the form of EDUs.	N	
PMTLM-25	SIMSS/PM-1 shall transmit EDUs on an as built basis.	F	
PMTLM-26	SIMSS/PM-1 shall provide the capability to transmit EDUs using the UDP protocol.	F	
PMTLM-27	SIMSS/PM-1 shall provide the capability to enable and disable the transmission of CLCW EDUs.	N	
PMTLM-28	SIMSS/PM-1 shall provide for the storage of EDUs.	N	
PMTLM-29	SIMSS/PM-1 interface with the EOC shall comply with the telemetry interface formats and protocols specified in the EDOS to EGS Elements interface documents.	F	
PMTLM-30	SIMSS/PM-1 shall provide the capability to accept PM-1 telemetry data by electronic transmission and by physical media.	N	
PMTLM-31	SIMSS/PM-1 shall be capable of transmitting the contents of a user provided file containing PM-1 telemetry data	N	
PMTLM-32	SIMSS/PM-1 shall be capable of maintaining an internally generated time code.	P	Presently system time is used to maintain time code. An internal timing card will be used in a future release.
PMTLM-33	SIMSS/PM-1 shall set, adjust, and operate the spacecraft clock as commanded.	N	

## Attachment G – Requirements Matrix

<b>Requirement Specification</b>	<b>Requirement Description</b>	<b>Compliance (Full/Partial/None)</b>	<b>Comment</b>
PMTLM-34	SIMSS/PM-1 shall employ an offline utility to convert the ASCII-formatted PDB into a binary format useable by SIMMS/PM-1.	N	
PMTLM-35	SIMSS/PM-1 shall use the PDB to determine the APID number and length of valid PM-1 telemetry packets.	N	
PMTLM-36	SIMSS/PM-1 shall use the PDB to determine the number and mnemonics of telemetry parameters.	N	
PMTLM-37	SIMSS/PM-1 shall use the PDB to define raw-to-EU conversions for telemetry parameters. SIMSS/PM-1 shall support both linear and polynomial conversions.	N	
PMTLM-38	SIMSS/PM-1 shall use the PDB to determine valid SIMSS/PM-1 command formats.	N	
PMTLM-39	SIMSS/PM-1 shall use the PDB to determine telemetry end-item verifiers for commands.	N	
PMTLM-40	SIMSS/PM-1 shall execute modeling directives that enable or disable selected orbit modeling.	N	Modeling requirement TBD
PMTLM-41	SIMSS/PM-1 shall execute modeling directives that associate any telemetry parameter with a predefined model.	N	Modeling requirement TBD
PMTLM-42	SIMSS/PM-1 shall execute modeling directives that change between static, table or algorithm models.	N	Modeling requirement TBD
PMTLM-43	The SIMSS/PM-1 GUI shall acknowledge each operator request within 2 seconds of entry.	F	
PMTLM-44	The SIMSS/PM-1 GUI shall start execution of each operator request within 5 seconds of entry.	F	
PMTLM-45	SIMSS/PM-1 shall provide the operator with an offline capability to access model functions and coefficients.	N	Modeling requirement TBD
PMTLM-46	SIMSS/PM-1 shall provide the operator with an offline capability to translate ASCII-formatted files containing static, table and algorithm orbit modeling information into a binary form readable by SIMSS/PM-1.	N	Modeling requirement TBD
PMTLM-47	SIMSS/PM-1 shall be capable of maintaining an internal time code to a resolution of 200 milliseconds.	N	
PMTLM-48	SIMSS/PM-1 shall provide the capability to store up to 8MB of transmitted EDUs.	F	
PMTLM-49	SIMSS/PM-1 shall receive CLTUs in command data blocks and output EDUs (packets and CLCWs).	N	
PMTLM-50	SIMSS/PM-1 shall generate telemetry based on four Spacecraft Controllers. The telemetry contents shall be based on packet lists and format tables provided by the PM-1 project.	N	

## Attachment H – System Limitations

### H.1 SIMSS/PM1 Release 1.0 Limitations

The following limitations apply to SIMSS/PM1 Release 1.0.

<b>Problem Description</b>	<b>Possible Workaround</b>
When restoring a saved project, only the system configuration is presently restored, not the individual module settings.	When restoring a saved project, re-enter individual module settings.
When saving a project, the configuration must be saved prior to running.	None
If the system receives CLTUs with multiple transfer frames or transfer frames with multiple packets, warning event messages will be generated that indicate possible errors in transfer frame header or packet header length fields. The unexpected bytes will not be processed.	None
Only one project ID can be handled with the current version of SIMSS/PM1 (id=0). In consequence, before a saved project is restored, the client must be shut down and restarted in order to reset the client's project id to 0.	The client must be restarted before a project can be restored.
When logging telemetry, using default log file names will corrupt log data. This occurs because both telemetry streams will be written to the same log, since each log file default name is identical.	When logging more than one telemetry stream, rename the log files to make them unique.
The telemetry transmit rate can be set to zero. The system will terminate abnormally when the rate is set to zero.	For this release, use the default rates set up for each APID. Do not set to zero.
Invalid IP address and port settings will cause the system to terminate abnormally.	Check with system administrator for valid IP address and port numbers before entering the values into the system.
When left running, the system will eventually terminate abnormally.	Reset the computer and bring the simulator back up.

## **H.2 Assumptions**

The following assumptions have been made based upon current information available for the PM-1 spacecraft:

1. The input buffer for commanding for SIMSS/PM1 Release 1.0 is defined to be 900 bytes long. The Command Data Block (CDB) messages may contain multiple CLTU messages.
2. A new note in the EOS Space to Ground ICD (D22262A) dated June 12, 1999 within a CLTU. For SIMSS/PM1 Release 1.0, each CLTU message is assumed to contain one transfer frame. Multiple TIE commands were assumed to be packaged in multiple CLTUs.
3. Each AD Transfer Frame is assumed to contain one complete packet.

**Attachment I - Release History Summary Matrix**

Attached is the release history summary matrix for SIMSS/PM1 Release 1.0.

### Release History Summary Matrix

SYSTEM:		SIMSS/PM1							
RELEASE NUMBER		1.0							
DELIVERY DATE		7/30/99							
CONFIGURATION ITEM	CI NO.								
Core (client)	1.1	1.0							
Core (server)	1.2	1.0							
SC-PM1 (client)	1.3	1.0							
SC-PM1 (server)	1.4	1.0							
GS (client)	1.5	1.0							
GS (server)	1.6	1.0							
IP input (client)	1.7	1.0							
IP input (server)	1.8	1.0							
IP output (client)	1.9	1.0							
IP output (server)	2.0	1.0							

DQM (client)	2.1	*							
DQM (server)	2.2	*							
Logging (client)	2.3	1.0							
Logging (server)	2.4	1.0							

\* To be delivered in a future release

## Attachment J - Listing of Delivery Contents

### J.1 Software

Filename listing to be supplied (TBS)

### J.2 Hardware

Qty	Common Name	Model [Serial No.]	Mfg	CSOC No.	Description
1	Computer	E-4200 0013438946	Gateway	C0060052	Enterprise E-4200, Intel Pentium III 450Mhz, 128 MB memory module, ATI 8MB AGP video card, 32x IDE CDROM, 9GB SCSI hard drive, Iomega 100 MB internal zip drive, 3.5" 1.44 MB floppy diskette drive, 200 Watt ATX case, 3COM PCI 10/100 twisted pair adapter
1	Monitor	VX1100 811053230	Gateway	C0060043	VX1100 21" Monitor with 19.7" viewable area
1	Mouse	Intellimouse 2570752- 10000	Microsoft	None	Mouse
1	Keyboard	Q9045A1951	Gateway	None	104-key keyboard
1	Timing Card	PCIDCC20-P	Industrial Computer Source	None	PCI counter/timer card, 20 channel

### Attachment K - Documentation References

The following documents have been employed as the main sources for direction and information in producing Release 1.0 of the SIMSS/PM-1 simulator.

Document	Location
TRW, Earth Observing System (EOS) Common Spacecraft Program Interface Control Document Between the EOS PM-1 Spacecraft and the EOS Ground System, No.: D22262, latest version dated June 12, 1999 (more commonly known as "The Space to Ground ICD")	1
National Aeronautics and Space Administration, Goddard Space Flight Center (GSFC), ICD Between the EOS PM-1 Spacecraft and the EOS Ground System Appendix Z: Additional Control Center Interface Information Revision 4 (draft), dated June 17, 1999	1
TRW, EOS PM-1 Spacecraft Flight Software Requirements Specification, ES-SDA-001	1
TRW, Earth Observing System Common Spacecraft Program Flight Software User's Guide, No.: D26696, latest version dated July 31, 1998	1
TRW, EOS Common Spacecraft Command Allocation Document, No.: D25099, (preliminary)	1
TRW, Earth Observing System (EOS) EOS PM-1 Telemetry Allocation Document, No.: D25100, (preliminary)	1
TRW, EOS PM-1 Spacecraft Equipment Specification for Transponder Interface Electronics, No.: EQ4-4957, latest version dated 11 February, 1999	1
TRW, Interface Control Document Between the Earth Observing System (EOS) Data and Operations System (EDOS) and the EOS Ground System (EGS) Elements CDRL B301	2
Consultative Committee for Space Data Systems, CCSDS 102.0-B-4: Packet Telemetry Blue Book, Issue 4, Nov. 1995	3
--, CCSDS 202.1-B-1: Telecommand Part 2.1 – Command Operations Procedures Blue Book, Issue 1, Oct. 1995	3
NASA, GSFC, Earth Observing System Data and Information System (EOSDIS) Test System (ETS) Functional and Performance Requirements for the PM-1 Spacecraft, Sep. 1998	-

Location Legend:

Number	Designation
1	<a href="http://www.omitron.com/eospm/eosfos/mitrw.HTM">http://www.omitron.com/eospm/eosfos/mitrw.HTM</a>
2	<a href="http://esdis-it.gsfc.nasa.gov:8080/servlet/DOCcat?nCatType=ICD">http://esdis-it.gsfc.nasa.gov:8080/servlet/DOCcat?nCatType=ICD</a>
3	<a href="http://ccsds.org/publications.html">http://ccsds.org/publications.html</a>

**Attachment L — Mission Systems Configuration Management Form**

This attachment contains the completed Mission Systems Configuration Management (MSCM) form for the delivery of SIMSS/PM1 Release 1.0.

**Mission Systems Configuration Management Form**

<u>1. ORIGINATOR</u> Estelle Noone	<u>2. ORGANIZATION</u> CSC	<u>3. PHONE</u> 301-805-3653	<u>4. E-MAIL ADDRESS</u> enoone@csc.com		
<u>5. ELEMENT</u> ETS (MPS/PM-1)		<u>6. INSTALLATION PRIORITY</u> Routine	<u>7. TRACKING NUMBER</u> (Assigned by CM Office)		
<u>8. SOURCE CHANGE REQUEST(S):</u> ETS First Delivery of New MPS for EOS PM-1 (SIMSS/PM1)		<u>9. APPROVALS</u> Element Manager _____ / / Flight Ops Director _____ / / Operations Manager _____ / /			
<u>10. DELIVERED SYSTEM</u> (Check all that apply)					
	Name	Version	Media Identification	Identification Date	
<input checked="" type="checkbox"/>	Hardware	<u>SIMSS/PM1</u>	<u>R1.0</u>	<u>PC, Monitor, Keyboard, Mouse, Timing Card</u>	<u>7/30/99</u>
<input checked="" type="checkbox"/>	Software	<u>SIMSS/PM1</u>	<u>R1.0</u>	<u>CD-ROM Installation Disk</u>	<u>7/30/99</u>
<input type="checkbox"/>	Database	_____	_____	_____	_____
<input checked="" type="checkbox"/>	Documentation:				
	<u>MPS/PM1 delivery package</u>	<u>N/A</u>	<u>3.5" Diskette</u>	<u>7/30/99</u>	
	_____	_____	_____	_____	
	_____	_____	_____	_____	
<input type="checkbox"/>	Other	_____	_____	_____	_____
<u>11. CHANGE DESCRIPTION</u> Initial delivery _____ _____ _____					
<u>12. ATTACHMENT(S):</u> Check if YES <input checked="" type="checkbox"/> Description: <u>MPS/PM1 (SIMSS/PM1) Release 1.0 delivery package (cover letter with attachments) dated 7/30/99</u> _____					
<u>13. CM OFFICE USE</u>					
	Location (Bldg/Room)	Slot location(s)			
Hardware	_____ / _____	_____			
Media	_____ / _____	_____			
Documentation	_____ / _____	_____			
Installation date	_____ / _____ / _____	CM Office Signature _____			

Form MSCM (970327)

REQUIREMENTS: [Netscape 3.0](#) (or later) browser



# ESDIS

## Discrepancy Report Tracking Tool

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Choose from the following options:



### [DRTT Access\\*](#)

This area provides access to the DRTT database for all registered users



### [Info Desk](#)

Register for full DRTT access, browse our web tools, or send a message to the administrator



### [PDTT Access\\*](#)

This area provides access to the PDTT database for all registered users



### [Metrics](#)

View DRTT metrics based on DR status



### [Training/Demo Slides](#)

View DRTT PowerPoint Training/Demo Slides

NOTE: \* indicates that you must be a registered user to access this function

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## About the [DRTT](#)

The purpose of the Discrepancy Report Tracking Tool (DRTT) is to manage and track all defects and discrepancies which are encountered during test activities of the EOS Ground System (EGS).

This home page is the user interface to the DRTT, which contains descriptions of all DRs which are written across EGS. The intent of the DRTT is to allow ESDIS personnel to quickly and easily input new DRs, search DRs currently in the DRTT database, and to generate statistical reports based on the DRs entered in the system.

The DRTT has been designed to support the ESDIS System Management Office (GSFC Code 505) and is maintained by the System Integration and Test (SI&T) Support Team.

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[NASA Website Privacy Statement](#) \* [NASA IT Security Warning Banner](#)

Prepared for: Paul Ondrus, [paul.ondrus@gsfc.nasa.gov](mailto:paul.ondrus@gsfc.nasa.gov), GSFC Code 505

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