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Memo

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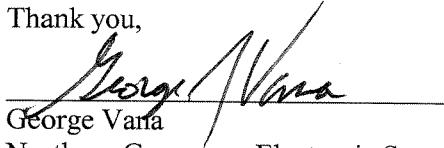
From: George Vana

Subject: SSMIS Ground Processing Software (GPS) Rev6 Release Notes

The CD-ROM identified as "SSMIS GPS (Rev6)" is released by Northrop Grumman Electronic Systems for operational use. This revision supersedes all previous releases. Information is provided below on 1) software changes incorporated in Rev6, 2) associated documentation, and 3) distribution of the GPS Rev6 software on CD-ROM.

Questions regarding Rev6 may be sent to the undersigned at the e-mail address below.

Thank you,


George Vana
Northrop Grumman, Electronic Systems, Azusa
SS&S Operations Support
(626) 812-2632
george.vana@ngc.com

Memo Distribution:

Northrop Grumman (Baltimore) - Francine Hall
Northrop Grumman (Azusa) - James Curl, David Maxwell

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1 Software Changes from Rev5 to Rev6

The SSMIS GPS Revision 6 (Rev6) Compact Disc (CD) contains source code for the Ground Processing (GPS) and Early Orbit / State of Health (EOSOH) software. Rev6 contains software changes that have been made from the bonded Rev5 version. These software changes have been unit tested, peer reviewed, regression tested, and bonded by Software Quality Engineering. The following paragraphs summarize the changes incorporated in Rev6 since the previous Rev5 baseline. These include change made in Interim Releases Rev5A and Rev5B that are rolled up into the Rev6 baseline.

1.1 Rev5A Changes

1.1.1 SCR 05-0004 Pad Geomagnetic Databases with Zeros to Achieve an Even 512 Byte Boundary

This software change corrects problems with all of the geomagnetic database files. This change was necessary before the geomagnetic files could be updated for the current year.

1.1.2 SCR 05-0013 Fill in Blank Resampled Data with Non-Resampled Temperatures

This software change corrects a problem with the resampling algorithm skipping the first six scans of the RSDR file because there is not enough information available to resample them. In previous GPS revisions, the software does not fill in these array values with anything, causing them to default to 0 degrees Kelvin.

1.1.3 SCR 05-0014 Update Revision Number to Rev 5.A/5A

This software change updates the version number to Revision 5A.

1.2 Rev5B Changes

Rev5B incorporates Rev5A and the changes described in the following paragraphs.

1.2.1 SCR 05-0001 Identify Constants File Values in SDRP and EDRP Products

This software change adds a file naming convention with a checksum to aid in the identification of the constants and provide a method for the user to verify datasets with the appropriate constant values.

1.2.2 SCR 05-0002 Add SDRP Processing Options to Limit SDR and TDR Diagnostics

This software change provides a method to limit the SDR and TDR diagnostics when they are enabled and not desired by the user.

1.2.3 SCR 05-0003 Correct File Unit #s in SDRP Diagnostics

This software change corrects a defect in reporting the file unit # in the SDR Diagnostics file.

1.2.4 SCR 05-0005 Remove All Hard coded Directory Paths within Routines

This software change improves the GPS code by eliminating hard coded directory paths resulting in reduced integration workload for the user community.

1.2.5 SCR 05-0006 Fix SDRP Checksum Processing Switch

This software change corrects a defect in the SDRP override file where the switch for checksum processing (1062) works only as if set to 0 – ‘process all frames’.

1.2.6 SCR 05-0009 Plot More Than 32767 Scans in EOSOH

This software change is an improvement to EOSOH to allow increase the number of scans that can be plotted.

1.2.7 SCR 05-0012 Add PNG Image Output to EOSOH

This software change is an improvement to EOSOH to add PNG image file format.

1.2.8 SCR 05-0015 Correct Sun Incursion into the Warm Load, Moon Intrusion into Cold Load and Remove Calibration Spikes

This software change is the most significant change in GPS Rev6. Correction algorithms has been incorporated to detect, smooth, and interpolate gain changes due to Sun incursions (direct and reflected) into the Warm Load causing abnormal radiometric gain calculations. Similarly, Moon incursions into the Cold Load window can also affect gain and are corrected. Finally, short duration spikes in the gain curves are not based on real sensor performance and are corrected.

1.2.9 SCR 05-0018 EOSOH Option to Skip Processing Truncated Last Scan

This software change is an improvement to EOSOH to preclude processing of the last scan in an RSDR file since this scan can have missing (zero) data values.

1.2.10 SCR 05-0019 Filter Known 32768 Values in Early Orbit 2a

This software change is an improvement to EOSOH Early Orbit 2a to add filtering for saturated values as currently exists in Early Orbit 2b and 2c modes..

1.2.11 SCR 05-0020 Use Calibration Counts in Early Orbit 2 Modes

This software change is an improvement to EOSOH Early Orbit 2 modes to add computing of Gain, NEDT, and Brightness Temperatures using Warm and Cold calibration counts as are found in Normal and Early Orbit 1 modes.

1.2.12 SCR 05-0021 Edit Raw Data and Save New RSDR File

This software change is an improvement to the EOSOH current ability to show raw RSDR data packets in non-editable tabular form. It allows the user to edit this data and create a new RSDR file with the changes.

1.2.13 SCR 05-0022 Load Multiple Adjacent RSDR Files Into EOSOH

This software change is an improvement to EOSOH to allow concatenation of RSDR files together as one continuous dataset.

1.2.14 SCR 05-0028 Fix Outstanding Bugs in EOSOH

This software change corrects minor defects in EOSOH. These include: the plot view does not resize after saving to an image file, Voltage button in the Housekeeping dialog should not select MUX 26, computation of Housekeeping warm load PRT does not save all 3 values for each scan, the extra 4 low bits of precision are lost when computing Housekeeping values, MUX current monitor data needs to be multiplied by 16 in Idle mode.

1.2.15 SCR 05-0033 Generate Geomagnetic Databases for years 2005-2010

This software change is a routine maintenance change to update the geomagnetic database tables to the current year. These tables are now current through 2010..

1.2.16 SCR 05-0035 Add Earth Surface Type Correction Factor to APC and Fix Ch 17-18 APC Additive Factor

This software change is in response to a request by the SSMIS F16 Cal/Val team to adjust the Antenna Pattern Correction factor (APC) to bring SSMIS more in line with those of the SSM/I environmental channels. Additionally, the APC formula needs to be corrected for the additive factor for channels 17 and 18. The multiplicative factor was inadvertently substituted for the additive factor. This error can be traced back to the code originally developed and provided by NRL.

1.2.17 SCR 05-0036 Fix Day Crossing Calculation

This software change corrects an interface issues with the logic for reverse time order in our files, which is the current format of the RSDR files. Resultant of this change is the calculated date of the files is now correct.

1.2.18 SCR 05-0037 Fix SSMIS Start-of-Scan Time Computation in SDRP

This software change corrects scan start time computations for errors introduced by the SSMIS flight software and missed interrupts from the OLS.

1.2.19 SCR 05-0038 Fix SSMIS Start-of-Scan Time Computation in EOSOH

This software change provides similar correction as 05-0037 in the EOSOH software.

1.2.20 SCR 05-0039 Add user notification message for interim builds

This software change is a improvement to Rev5b only to add a user notification when the build is not a formally qualified revision.

1.2.21 SCR 05-0040 Update Revision Number to Rev 5.B/5B

This software change updates the version number to Revision 5B.

1.2.22 SCR 05-0041 Implement update to constants file per Cal/Val team recommendation

This software change implements updates to the constants file for scan non-uniformity per recommendation of the SSMIS F16 Cal/Val team.

1.3 Rev6 Changes

Rev6 incorporates Rev5B and the changes described in the following paragraphs.

1.3.1 SCR 05-0034 EDRP Switch for Channel 1-5 Polarization

This software change implements a switch to use for SSMIS F16 which has Channels 1-5 with horizontal polarization versus the vertical polarization of subsequent SSMIS sensors.

1.3.2 SCR 05-0043 Scale SDR Environmental Channels 12-16 to Hundredths of a Degree

This software change modifies the scaling for environmental channels 12-16 1x2 averaging different from every other channel including channels 15 and 16 averaged at 5x5. The five channels in question are output at a resolution of 1/10th degree Celsius while the others are output at 1/100th degree Celsius. This change was made for consistency per recommendation of the SSMIS F16 Cal/Val team.

1.3.3 SCR 05-0044 Update Revision Number to Rev 6.0/60

This software change updates the version number to Revision 6.

1.3.4 SCR 05-0048 Incorporate Surface Tag Information for Non-Land Regions Into EDR Land Surface Type

This software change incorporates the non-land Surface Tag values into the Land Surface type output. This change was requested by AFWA in support of common modeling interfaces between sensors.

2 Documentation

The following documents describing the GPS Rev6 are available upon request from Northrop Grumman. Those marked with an “*” have been updated for the Rev6 release. Others are former documents and did not require updates.

Identification	Document Date	Title
S-DMSP-876A	24 Oct 2000	Prime Item Development Specification
S-DMSP-875A	24 Oct 2000	System Specification for the DMSP Block 5D-3 Special Sensor Microwave Imager / Sounder
S-DMSP-881C	19 Nov 2004	Software Requirements Specification for the Ground Processing Software of Special Sensor Microwave Imager/Sounder
S-DMSP-884B	7 May 2001	Interface Requirements Specification for the Ground Processing Software of Special Sensor Microwave Imager/Sounder
AE 26775E*	7 Nov 2005	Interface Design Document for the Ground Processing Software of Special Sensor Microwave Imager/Sounder
AE 26770	15 Jan 2001	SSMIS Ground Processing Software (GPS), SiteLib Interface Design Document
RE 11846D*	17 Nov 2005	Software Design Document for the Ground Processing Software of Special Sensor Microwave Imager/Sounder
RE 11796D*	29 Nov 2005	Software User's Manual for the Ground Processing Software of Special Sensor Microwave Imager/Sounder (Volume 1 and 2)
RE 12068C*	17 Nov 2005	Early Orbit / State of Health (EOSOH) Software User's Manual
RE 12621B*	9 Nov 2005	Algorithm & Data User's Manual for the Special Sensor Microwave Imager/Sounder (SSMIS)
RE 10298F*	29 Nov 2005	Version Description Document for the Special Sensor Microwave Imager/Sounder (SSMIS) Revision 4
RE 11819G*	10 Nov 2005	SSMIS GPS Early-Orbit/State-Of-Health Software (EOSOH) Test Plan and Procedures
RE 11957E*	15 Nov 2005	Software Test Plan / Procedures for the Special Sensor Microwave Imager/Sounder (SSMIS)Ground Processing Software (GPS)
Version 1	19 Jan 2001	DMSP Satellite Raw Sensor Data Record (RSDR) File Format Specification, HQ AFWA / Space Missions Branch, Capt. David M. Paal
NA*	30 Nov 2005	SSMIS GPS Rev6 Release Memo (this document)

3 CD Distribution

10 distribution copies of the Rev6 CD release are to be provided to Francine Hall, NGES. The distribution copies do contain the documentation and test files as well as do they contain the binary product readers. 3 additional copies of the full source code, documentation, and test files are created as a 2-CD set and are retained as indicated below.

Copy #	For:	Fed-ex to:
Master CM Copy	David Maxwell, NGES, Azusa CM	N/A
Bonded Copy	Michael Smith, NGES, Azusa SQA	N/A
1 Copy	George Vana, NGES SW Team Lead	N/A
Copies 1-10 (for distribution)	Francine Hall	Francine Hall, MS 3K28 Northrop Grumman Corp, Electronic Sensors and Systems Sector 1580A West Nursery Road Linthicum, MD, 21090