Space Dynamics Laboratory
Utah State University Research Foundation

Aeronomy of Ice in the Mesosphere (AIM)
Solar Occultation for Ice Experiment (SOFIE)
Instrument User Guide

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1 SCIENCE OVERVIEW

The primary science objective of the NASA Aeronomy of Ice in the Mesosphere (AIM) mission is to study Polar Mesospheric Clouds (PMCs), also known as Noctilucent clouds. Around 83 km in altitude, PMCs are the highest clouds in the atmosphere and are observed at latitudes between 50º and 60º north and south of the equator during the summer months. Observations to date indicate PMCs are increasing in number and brightness, and are being found closer to the equator. Presently, it is not understood how these clouds are formed; however, hypotheses that these clouds may be strongly correlated to global climate stability are being asserted. Questions are being asked about the relationship between these clouds and global temperature, atmospheric dynamics, and chemistry.

The Solar Occultation for Ice Experiment (SOFIE) instrument has been specifically designed to measure gasses, temperature, and particles in the atmosphere where PMCs form. SOFIE uses the solar occultation method to measure H_2O, CO_2, O_3, CH_4, and NO along with temperature and particle extinction at 10 wavelengths.

2 INSTRUMENT REQUIREMENTS

The AIM satellite will be launched on a Pegasus rocket into a 600-650 km polar sun-synchronous orbit where it will operate for a minimum of 25 months. SOFIE will perform two solar occultation measurements each orbit creating a data volume of approximately 115 Mbits per day. The steering mirror has a 2º X 2º field of regard which allows for SOFIE to locate and center on the sun.

During each solar occultation, SOFIE centers on the sun and gathers light through a 1.8 X 6 arc-minute field (vertical X horizontal). A sun sensor tracking system will reference the top edge of the sun to track this position within 15 arc-seconds. With a vertical spatial resolution > 3 km, SOFIE has been designed to track the sun from 315 km down to 0 km.

Sixteen bands are paired to form 8 channels measuring H_2O, CO_2, O_3, CH_4, and NO along with particle channels (shown in Table 1, below). The shorter wavelength bands use silicon carbide and germanium detectors while the longer wavelength bands use mercad telluride detectors. The bands are spectrally grouped in channel pairs of strong and weak absorbers for the target gasses or particles. When a target gas is measured, the strong absorbing band will only detect energy mostly attenuated by the gas so that the detector counts drop sharply. Inversely, the weak absorbing band will respond much less dramatically.

A third measurement is also processed to show the difference between the strong and weak bands. This ΔV signal is amplified to preserve high resolution in the difference signal not recoverable by ground post-processing of the strong and weak band signals alone.

Table 1: SOFIE Channel Overview

Channel	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Target Absorber	O_3	particles	H_2O	CO_2	particles	CH_4	CO_2	NO
Center λ (μm) Strong band Weak band	 0.290 0.328	 0.862 1.031	 2.60 2.45	 2.77 2.94	 3.06 3.19	 3.37 3.51	 4.25 4.63	 5.32 4.98
Signal/Noise	$1.0X10^4$	$1.0X10^6$	$2.5X10^4$	$3.0X10^5$	$1.0X10^5$	$4.0X10^5$	$4.0X10^5$	$3.0X10^5$
Detector Type	SiC	Ge	HgCdTe	HgCdTe	HgCdTe	HgCdTe	HgCdTe	HgCdTe

The high signal to noise ratios specified in Table 1 provided the input for the design of a 10 cm diameter telescope and significant detector gains in the electronic circuitry. The maximum acceptable nonlinearity for the strong and weak bands is 0.5% and 1% for the ΔV signals.

3 INSTRUMENT DESIGN

SOFIE consists of a separate instrument and electronics box. The instrument is mounted on the top deck of the AIM spacecraft and the electronics box is mounted to an interior panel. Cables connect the instrument to the electronic box as shown in Figure 1 (below).

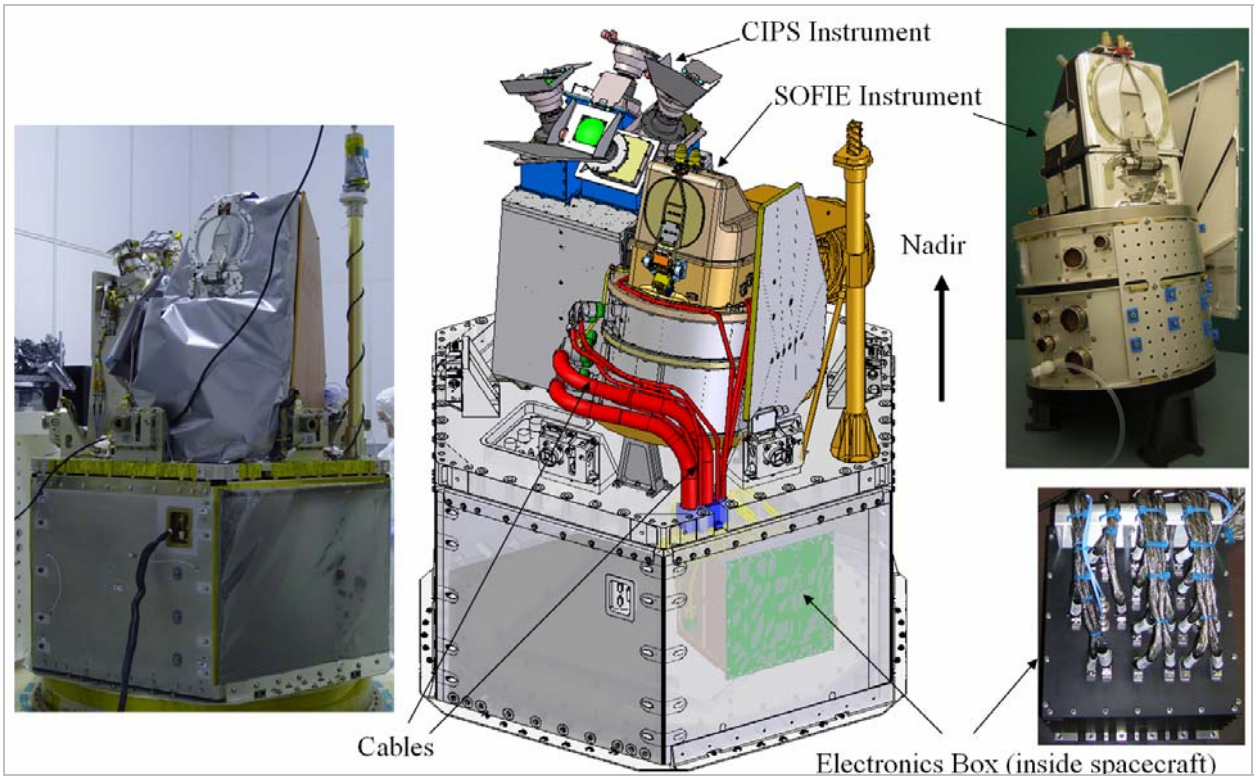


Figure 1: SOFIE Instrument and Electronics Box Mounted to the AIM Spacecraft

3.1 OPTICAL-MECHANICAL

A two axis steering mirror with a 2º X 2º field of regard capability directs the sunlight into the optical system as shown in Figure 2 (next page). A pick-off mirror, located above the central obscuration of the telescope, directs the light to the Sun Sensor Module Assembly. After passing through a neutral density and spectral filter, the light is focused onto a focal plane array. The electronic processes function to identify the sun and locate the topmost edge and also direct the optical boresight to a position near the center of the sun for tracking.

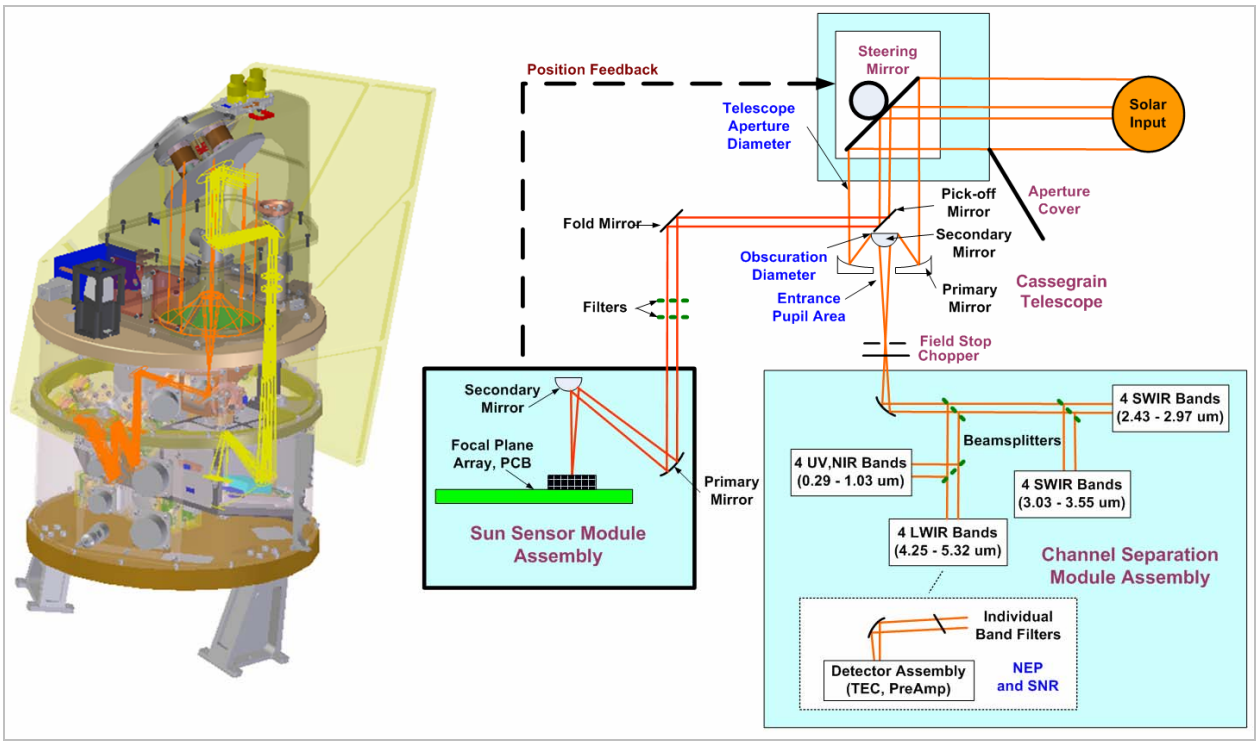


Figure 2: SOFIE Instrument Optical System

As sunlight strikes the Steering Mirror (or the sunbeam steering mirror), the light is focused by the Cassegrain telescope onto a field stop (see Figure 2). The field stop will portion a 6 X 1.8 arc-minute of the sunlight that will pass through a Chopper, be collimated and, finally, directed into the Channel Separation Module (CSM). The CSM uses a combination of filters and beam splitters to reflect or transmit spectrally selected portions of the sunlight and relay it to the appropriate band. Using this method, significant energy will be preserved (e.g., the energy lost using a broadband 50%-50% beam splitter).

As light is concentrated onto the detectors, the light becomes defocused. For bands 1-4, the resulting spot underfills the detector. For bands 5-16, the spot overfills the detector. The overfilling of bands 5-16 was intentionally implemented towards the end of instrument development to mitigate inherent detector non-linearity effects that were concurrently discovered. The detector non-linearity is a function of detector irradiance. The detectors are cooled by thermo-electric coolers (TECs) to -40º and -65º C.

The SOFIE instrument is 76 cm tall, 46 cm wide, 58 cm deep, and has a mass of 22.6 kg. The combined mass of instrument, electronics, and cables is 38.6 kg (Figure 3, below). The steering mirror is mounted in a housing sealed by an aperture cover. A fully redundant set of shape-memory alloy pin-pullers are used for the one-time release of the aperture cover on orbit. Sunlight is reflected toward the telescope mounted at the base of the housing. The CSM and Sun Sensor Module reside together in the body of the instrument.

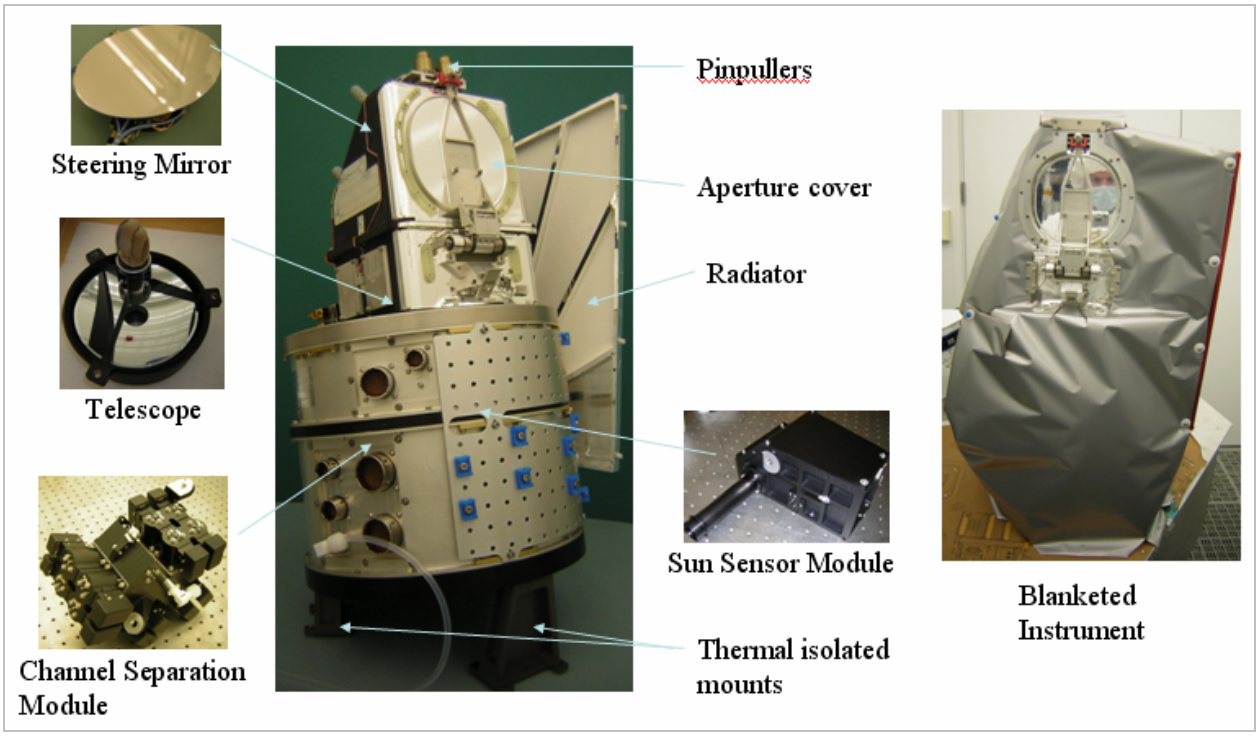


Figure 3: SOFIE Instrument Major Components

A radiator painted with white Alion Z93C55 electrically conductive paint dissipates the nominal 12 watts of power generated by the thermo-electric coolers and the sun sensor electronics. A germanium coated thermal blanket covers the entire instrument and provides electro-static dissipation as well as reasonably low emissivity. The functional temperature range of the instrument is from -50 to 35º C. Survival heaters are used (as needed) to keep the sun sensor board and steering mirror position sensor electronics above -35ºC.

The structure stiffness was designed to be above 100 Hz with few exceptions: (1) the bending mode of the radiator and (2) the steering mirror vibration isolation system (VIS). The VIS was added as a high frequency attenuating support structure to the steering mirror which allows the steering mirror to "float". The VIS also introduces lower frequency oscillation modes to the design. This compromise was acceptable to the design, but increased the uncertainty in the boresight direction that will be accounted for during on-orbit operations.

3.2 ELECTRONICS AND SOFTWARE

The 30 X 30 X 20 cm electronics box weighs 11.6 kg and houses 9 electronics boards mounted to a backplane with a power conditioning board below. Electronics and software functions include system command and data handling; scan mirror position and stabilization control; communication, signal conditioning, and mechanism control; thermal sensors, thermal electric cooler control, housekeeping and power conditioning. The system draws a nominal 46 watts with peak power of 78 watts. The functional temperature range is from -40 to 55ºC.

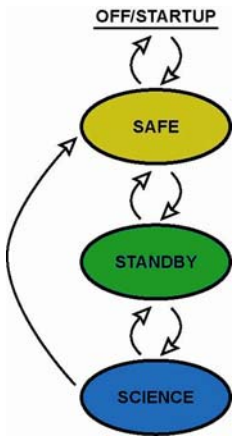
Signal conditioning of the detector channels is accomplished by first using pre-amplifiers behind the detectors to amplify the chopped signals. The amplified signals are then band-pass filtered at

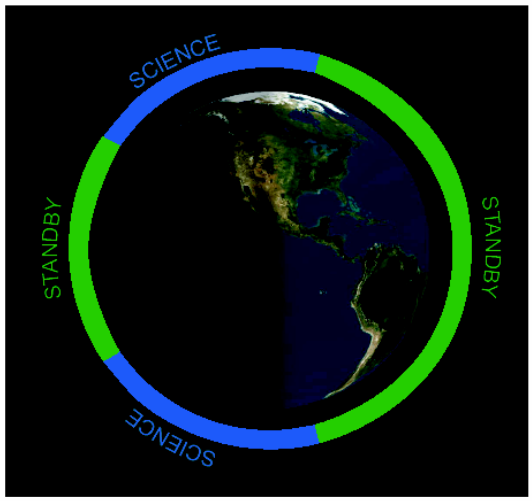
the 1000 Hz frequency of the chopper with a 2-Hz window. After the signals are synchronously rectified and low-pass filtered, balance attenuators are used to adjust the gains on each detector. At this point, the signal of each detector is fed into a differential amplifier to create the ΔV signal. Finally, all three signals are low-pass filtered and digitized.

The electronics system is controlled by a proprietary firmware/software design. The firmware design is based on ACTEL FPGAs and the software design is based upon two independent uController sub-systems. The firmware/software design controls the instrument's sun detection capability, all external interfacing with the spacecraft, and the internal instrument telemetry sampling. The instrument communicates with the spacecraft via a MIL-STD-1553B interface.

3.2.1 Mode Control

Upon power-up, the software will go through initialization and self-test (Off/Startup). It will wait in a 30-second hold state for spacecraft commands. If the instrument does not receive any spacecraft commands within the 30-seconds, the instrument will initialize in Safe Mode. When the spacecraft commands the instrument to Standby mode, SOFIE will wait for the next science event. When a science event occurs, SOFIE will enter its data collection mode termed Science Mode. Mode transitions are shown in the following diagrams:





The Off/Startup, Safe, Standby, and Science Modes are defined in the software. Survival mode is not defined in software, as the processor is not powered in that mode.

- **Off/Startup -** Upon startup, the SOFIE instrument will perform a self-test and initiate Safe Mode. If it is commanded to prepare for power down, the instrument will transition to Safe mode and enters a protective configuration (e.g., turn off the chopper and TECs). Losing power without warning will not be damage the instrument; however, SOFIE will be incapable of initiating protective measures.

- **Safe -** The SOFIE instrument enters Safe Mode when it has been started, reset, and as commanded. SOFIE will not exit this mode unless explicitly commanded via the spacecraft. While in Safe Mode: (1) uploaded timed commands will not be processed; (2)

stored command scripts will not be executed (to prevent it from autonomously exiting Safe Mode); and (3) the instrument will report all engineering data.

- **Standby -** Engineering data will be collected in both Standby and Safe Modes. From Standby Mode, the software will have the ability to: (1) receive, store, and execute timed commands; (2) execute uploaded command scripts, and (3) autonomously enter Science ode (data collection).

- **Science -** In the Science Mode, the software will collect science data and continue to collect engineering data. At the conclusion of a data collection event (DCE), the software will autonomously return to Standby Mode. *Note: Software updates are not recommended while the instrument operates in Science Mode.*

3.2.2 Data Flow

Commands to the instrument are received via the MIL-STD-1553B data bus and are transmitted in CCSDS specification-compliant formats. Only the Command & Data Handling (C&DH) board has a 1553 interface. The C&DH Board performs all command and data handling across the 1553 data bus. The Sun Sensor & Steering Mirror (SS&SM) board communicates with the C&DH Board via an RS-422 interface. The SS&SM Board receives commands and transmits data via the C&DH Board.

The instrument distinguishes two types of commands: (1) *real-time commands* are to be executed by the instrument within one second of being received; (2) *timed commands* are to be executed at a specified time on the mission clock. Timed commands are stored in volatile memory. The commands are time-ordered and checked for overlap by the C&DH Board software

Commands, both real-time and timed, can be received via ground uplink, via spacecraft autonomy (i.e., fault conditions) and via instrument autonomy. Instrument autonomy includes execution of macro commands.

There are two broad categories of data: (1) *engineering data* and (2) *science data*.

- *Engineering Data*. Engineering data consists primarily of state-of-health (SoH) measurements as well as command status, fault conditions, and diagnostics. Most SoH measurements are collected and reported by the C&DH Board software. Both the C&DH Board software and the SS&SM maintain independent command status, fault conditions, and diagnostics data. All data collected by the SS&SM will be reported through the 1553 data bus via the RS-422 inter-board communications.

- *Science Data*. There are three primary sources of science data: (1) the detector, (2) the image sensor, and (3) the steering mirror. The instrument detector data will be collected on the C&DH Board. Science data will be reported to the ground, used to calibrate the instrument, and used for other functions as needed/applicable. The image sensor data will be collected from the sun sensor. This data will be collected at a very high rate as input to the mirror pointing control algorithm. A subset of this data will be transmitted to the ground via the C&DH Board software. Like the image sensor, the steering mirror data will be collected at a very high rate to ensure the accuracy of the pointing control

commands. A subset of this data will be transmitted to the ground via the C&DH Board software. *Note: the steering mirror is now a fixed device and the data transmitted for it is no longer relevant or useful. The SOFIE software system was not updated to eliminate the transfer of this now static data set.*

3.2.3 Interrupts

The SOFIE software system implements time-division multitasking rather than preemptive multitasking. Hardware interrupts have been minimized where possible.

The C&DH Board software will respond to a 20-Hz interrupt generated by an FPGA that will be collecting and storing detector data. It will also respond to interrupts from the 1553 data bus. Communications across the RS-422 link, between the C&DH Board and the SS&SM Board, will be managed by an FPGA. The software will poll the communications buffer, but it will not need to respond to an interrupt.

The SS&SM Board will respond to the same 20-Hz interrupt generated by hardware. It will set a timer on each 20-Hz interrupt to generate four 10-millisecond timers to put the SS&SM Board on a 100-Hz interrupt cycle. It will not be necessary for the SS&SM Board to respond to any other interrupts. The SS&SM Board will poll communications on a 20-Hz cycle and will process the sun sensor data as well as the pointing and controlling data on the 100-Hz cycle.

Either board may receive interrupts due to error conditions. Under a non-maskable error condition, science data collection will abort.

3.3 MODULE DECOMPOSITION

SOFIE system software is divided into five Computer Software Configuration Items (CSCI): (1) one CSCI is for the ground support equipment (GSE); (2) two CSCIs are for the C&DH Board software; and (3) two CSCIs are for the SS&SM Board software. For each board, one CSCI functions as the Boot-Loader and the other CSCI functions as the operational software.

There is a lot of commonality between the Boot-Loader and the operational software. The operational software has all the functionality of the Boot-Loader, whereas the Boot-Loader has been designed to contain a minimal subset of the operational software to provide the highest reliability. The Boot-Loader includes critical elements such as communications (1553, RS-422), Fault Tolerance, and code updating. The Boot-Loader for each board is stored on its own non-volatile PROM. The instrument can be started from the PROM or from instruction memory (SRAM).

During normal startup, the Boot-Loader will copy the operational software from the EEPROM into the instruction SRAM and then reboot from the SRAM. The hardware design provides 32k words of PROM space for the Boot-Loader and 128k words of SRAM space for the operational software.

CSCIs are segmented into CSCs. Because of the commonalities of the Boot-Loaders and the operational software, the Boot-Loaders share many of the operational software's CSCs. Table 2 (next page) details the relationships between CSCIs and corresponding CSCs:

Table 2: The Relationship between CSCI and Corresponding CSCs

CSC w/Functions	CSCIs				
	Ground Support Equip	C&DH Boot-Loader	C&DH Operational Software	SS&SM Boot-Loader	SS&SM Operational Software
GSE (CSC00)					
Graphical User Interface	x				
Command & Data Processor	x				
1553 Bus Controller	x				
S/C Command (CSC01)					
C&DH Init & Task Manager		x	x		
C&DH Queue Functions		x	x		
1553 Command Handler		x	x		
Command Pre-Processor		x	x		
C&DH Test (CSC02)					
C&DH Self-Test & Diagnostics			x		
Code Update (CSC03)					
Code Updater		x	x		
C&DH Fault Tolerance (CSC04)					
C&DH Error Handler & Fault Response		x	x		
S/C Data (CSC05)					
1553 Data Handler		x	x		
C&DH Executor (CSC06)					
C&DH Command Executor		x	x		
Thermo-Electric Coolers Control			x		
Detector Channel Control			x		
Chopper Control			x		
Timing & Automation (CSC07)					
Timed Command Processor			x		
Automation Processor			x		
Data Acquisition (CSC08)					
System Data Handler		x	x		
Engineering Data Handler			x		
Science Data Handler			x		
Memory Dump Data Handler			x		
Intra-Comm SS&SM (CSC09)_					
Sun Sensor Board Comm Handler			x		
Intra-Comm C&DH (CSC10)					
SS&SM Init & Task Manager				x	x
SS&SM Queue Functions				x	x
C&DH Board Comm Handler				x	x
SS&SM Data Acquisition Handler				x	x
SS&SM Test (CSC11)					

Table 2: The Relationship between CSCI and Corresponding CSCs

CSC w/Functions	CSCIs				
	Ground Support Equip	**C&DH Boot-Loader**	**C&DH Operational Software**	**SS&SM Boot-Loader**	**SS&SM Operational Software**
SS&SM Self-Test and Diagnostics					x
SS&SM Fault Tolerance (CSC12)					
SS&SM Error Handler & Fault Response				x	x
SS&SM Executor (CSC13)					
SS&SM Command Executor				x	x
Mirror Pointing (CSC14)					
Pointing and Stabilization					x
Steering Mirror Handler					x
Sun Tracking (CSC15)					
Sun Tracking Algorithm					x
Image Co-adder					x

3.4 C&DH BOARD SOFTWARE

The C&DH Board software consists of two CSCIs, the Boot-Loader and the operational software. The Boot-Loader is composed of six CSCs. The operational software includes those six CSCs plus an additional three CSCs (totaling nine CSCs).

3.4.1 C&DH Board Boot-Loader Software

The Boot-Loader Software includes the following CSCs:

- S/C Command
- C&DH Executor
- Code Update
- C&DH Fault Tolerance
- Data Acquisition
- S/C Data

The structural diagram of the C&DH Board Boot-Loader CSCI is shown in Figure 4 (below).

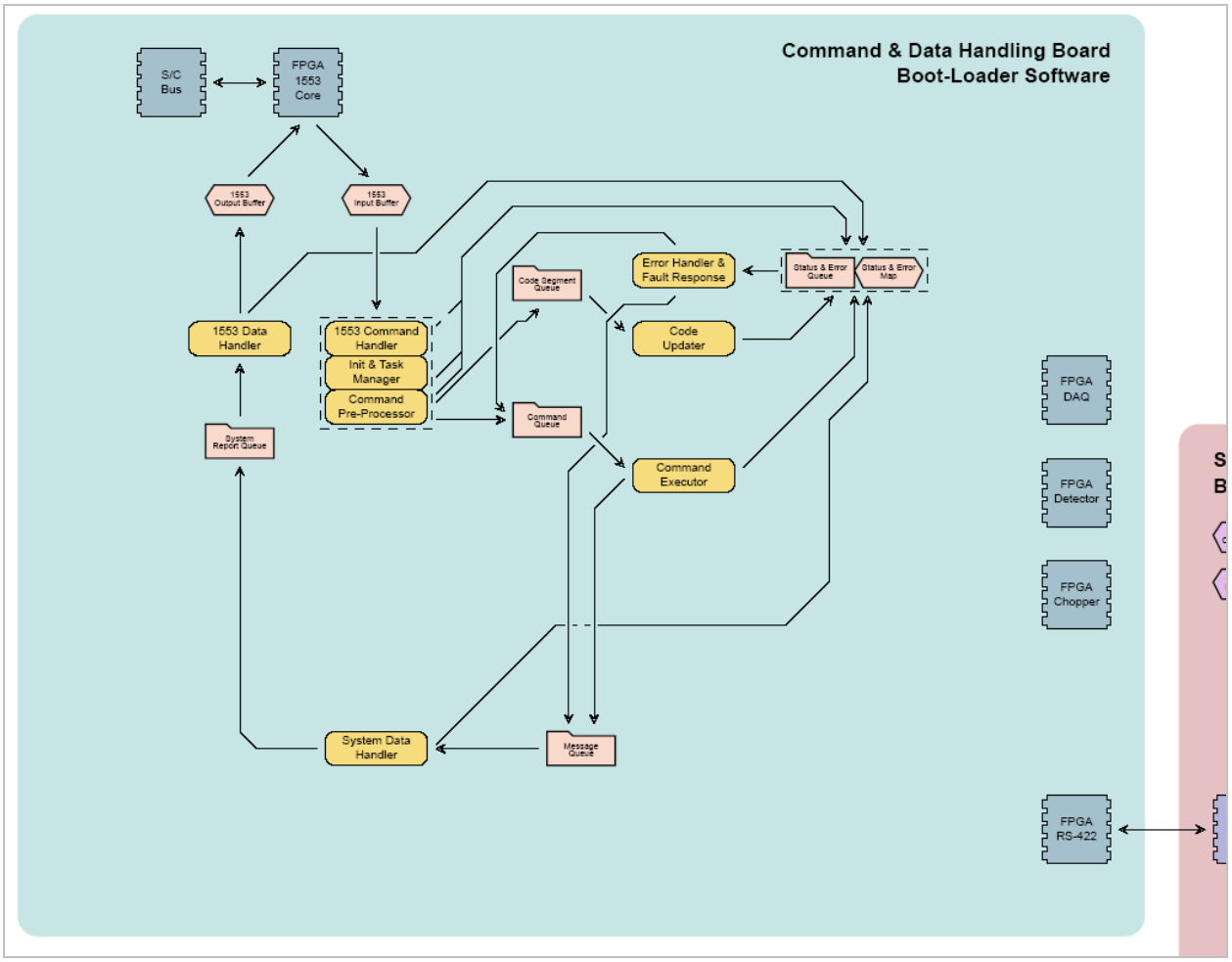


Figure 4: C&DH Board Boot-Loader, Structural Diagram

3.4.2 C&DH Board Operational Software

The operational software includes the following CSCs:

- S/C Command
- C&DH Test
- Code Update
- C&DH Fault Tolerance
- S/C Data
- C&DH Executor
- Timing & Automation
- Data Acquisition
- Intra-Comm SS&SM

A structural diagram of the C&DH Board Operational Software CSCI is shown in Figure 5 (below).

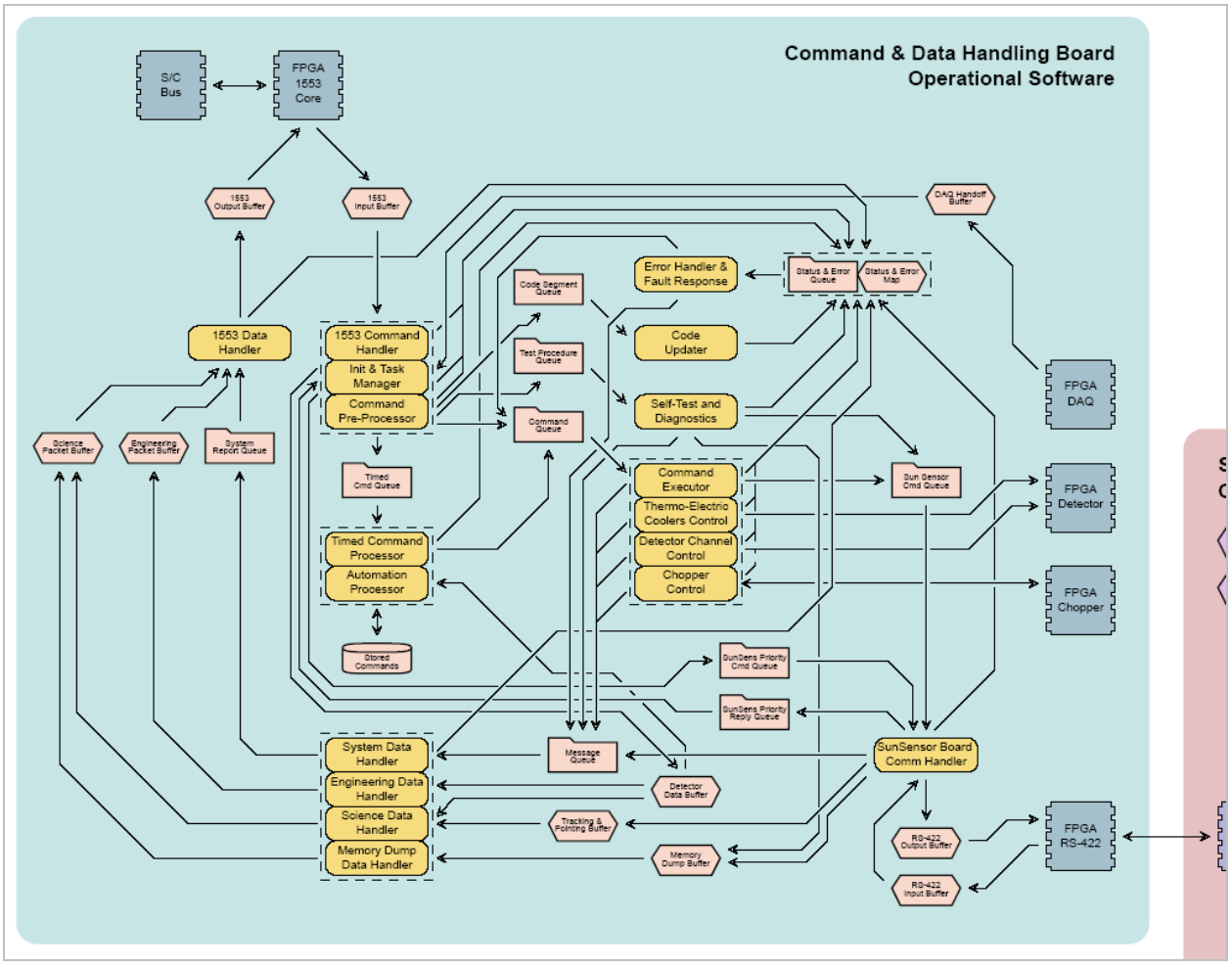


Figure 5: C&DH Board Operational Software, Structural Diagram

3.4.3 C&DH Board Computer Software Component

- **S/C Command –** This CSC includes the functions of initialization, self-test, and configuration of the software at boot-up. It also provides the task manager for the software. Receipt of 1553 commands is also handled by this CSC, which includes a command pre-processor to verify commands. Based on command codes, this CSC determines if the commands are for operations, system tests, or code uploads. This CSC is present in the Boot-Loader and the operational software.

- **C&DH Test -** This test does not include the self-tests used at startup to verify the instrument is capable of entering an operational state (such as the verification of the code's checksum); rather, this module provides a library of tests and other diagnostics that are not automatically executed at startup. This CSC is present in the operational software.

- **Code Update -** The code update CSC is used to load a new functional image via 1553 command. The code image is received in multiple small packets from the 1553, verified, and assembled in SRAM memory. If the code updater operates from the PROM-based Boot-Loader, the code image may be uploaded into the instruction memory and tested before being committed to EEPROM. If the code updater operates from the SRAM-based operational software, the code image must be uploaded into data memory. It can be tested against a checksum, but an operational test should be run before being committed to EEPROM. The code update CSC is present in the Boot-Loader and the operational software.

- **C&DH Fault Tolerance** - This CSC receives error messages through a data queue. If it is determined that such functionality is needed, the Fault Tolerance CSC will perform limit checks on instrument engineering data. When the instrument encounters an error condition, the Fault Tolerance CSC will take appropriate action. This can be as simple as reporting the error through the engineering data queue or it can be more intrusive, such as placing the instrument in a safe configuration pending ground intervention. The C&DH Fault Tolerance CSC is present in the Boot-Loader and the operational software.

- **S/C Data -** The spacecraft data CSC has the principal function of compiling engineering and science data into packets and transferring the data packets to the 1553 hardware. This CSC is present in both the Boot-Loader and the operational software.

- **C&DH Executor -** The C&DH executor receives commands through a command queue and either executes the commands or routes the commands to the appropriate channels. The executor provides mode control for the system. It relays commands to the sun sensor and it controls the mirror cover, the thermo-electric coolers, the detector channel, and the chopper. The command executor CSCI is present in the Boot-Loader. The other CSCIs of this CSC are only present in the operational software.

- **Timing & Automation -** The timing and automation CSC collects and stores timed commands in a queue until they are to be executed. This CSC organizes commands by time and checks for overlapping and conflicting commands. It also handles execution of

macro commands. The CSC regulates the instrument clock to ensure it can be correlated to the spacecraft system clock.

- **Data Acquisition -** The data acquisition CSC receives multiple types of data, including state-of-health, error reports, test & diagnostics results, command status, detector data, pointing control data, sun sensor data, and so forth. This CSC collects, time-stamps, categorizes, formats, and distributes data to the science data queue or engineering data queue. The Data Acquisition Handler CSCI of this CSC is present in the Boot-Loader. The other Data Acquisition Handler CSCIs of this CSC are only present in the operational software. When the Boot-Loader is running, only the message queue is used; science data will not be collected.

- **Intra-Comm SS&SM -** The Intra-Comm SS&SM CSC handles communications between the C&DH Board software and the SS&SM Board software on the C&DH Board side. This includes routing commands from the C&DH executor to the SS&SM Board and receiving engineering and science data from the SS&SM Board. This CSC is only present in the operational software.

3.5 SS&SM BOARD SOFTWARE

Like the C&DH Board software, the SS&SM Board software consists of two CSCIs (Boot-Loader and operational software). The SS&SM Board Boot-Loader is composed of only three CSCs. The operational software includes those three CSCs plus an additional three CSCs for a total of six CSCs.

3.5.1 SS&SM Board Boot-Loader CSCs

The SS&SM Board Boot-Loader software includes the following CSCs:

- Intra-Comm C&DH
- SS&SM Executor
- SS&SM Fault Tolerance.

The SS&SM Board Boot-Loader CSCI structural diagram is shown in Figure 6 (below).

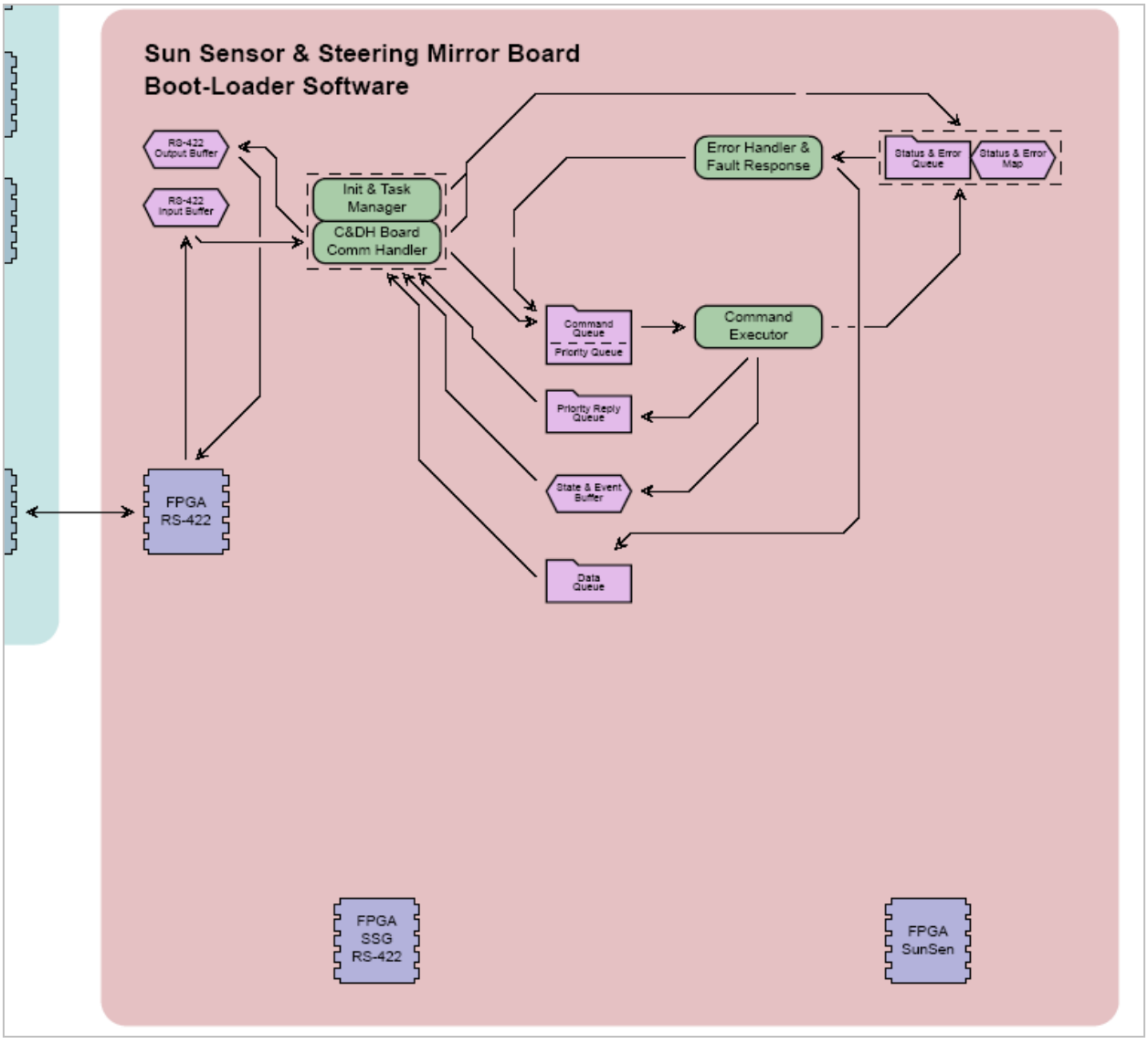


Figure 6: SS&SM Board Boot-Loader CSCI Structural Diagram

3.5.2 SS&SM Board Operational Software

The operational software includes the following CSCs:

- Intra-Comm C&DH
- SS&SM Test
- SS&SM Fault Tolerance
- SS&SM Executor
- Mirror Pointing
- Sun Tracking.

The SS&SM Board Operational Software CSCI structural diagram is shown in Figure 7 (below).

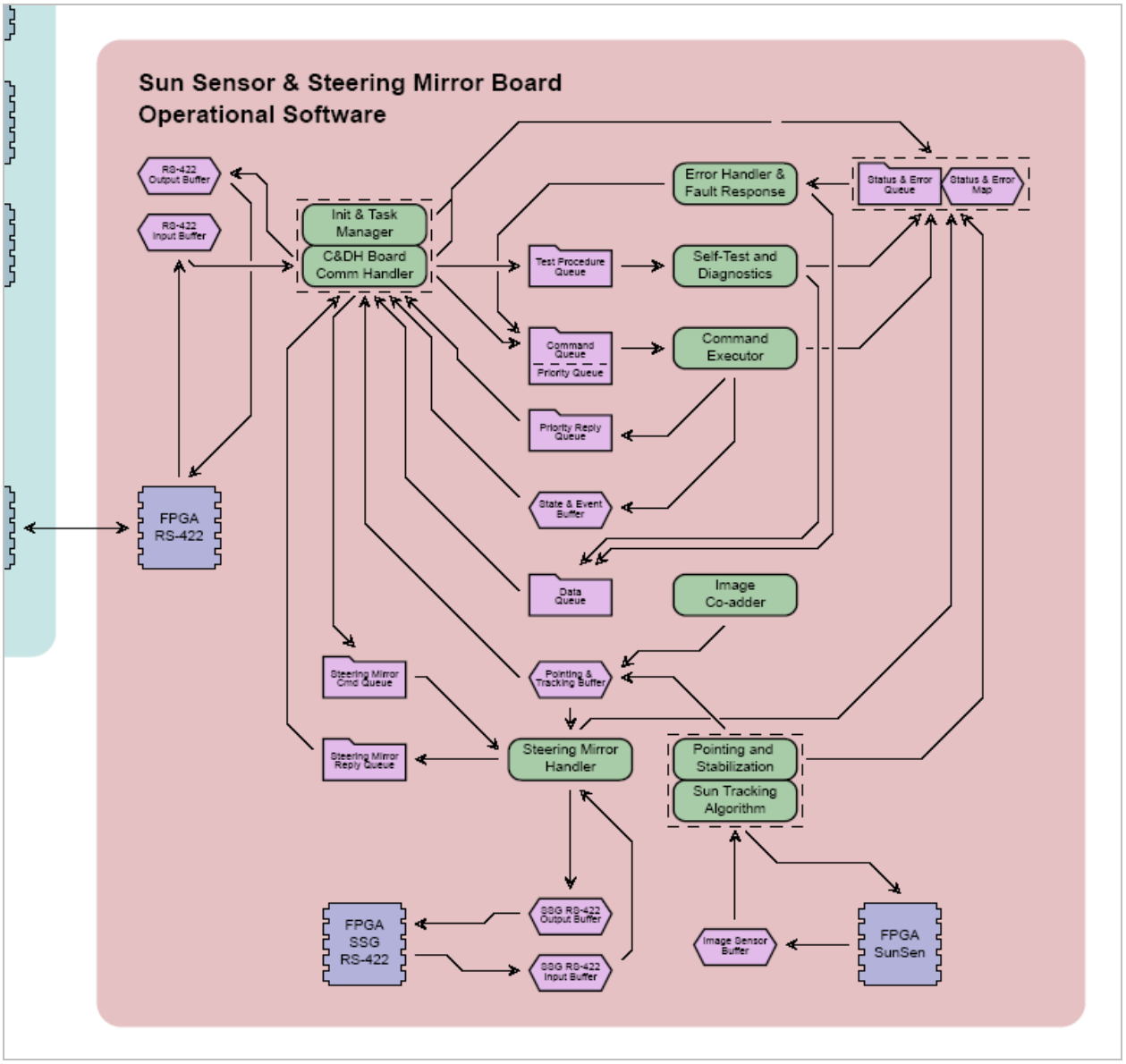


Figure 7: SS&SM Board Operational Software CSCI Structural Diagram

3.5.3 SS&SM Board CSCs

- **Intra-Comm C&DH** - This CSC includes the functions of initialization and configuration of the software at boot-up. It also provides the task manager for the software. Communications between the SS&SM Board and the C&DH Board are handled by this CSC, including receiving commands from the C&DH Board and collecting and sending engineering and science data to the C&DH Board. This CSC is present in the Boot-Loader and the operational software.

- **SS&SM Test** - This CSC does not include the self-test performed at start-up; rather, this CSC provides a set of tests and other diagnostics which may be executed by ground command. This CSC is present in the operational software.

- **SS&SM Fault Tolerance** - This CSC receives error messages and generates the appropriate responses. If determined necessary, the Fault Tolerance CSC will perform limits checking SoH data. When the instrument encounters an error condition, the Fault Tolerance CSC will report the error to the C&DH Board for downlink with engineering telemetry. Depending on the severity of the error condition, it may place the instrument in a safe state until ground command intervenes. The C&DH Fault Tolerance CSC is present in the Boot-Loader and the operational software.

- **SS&SM Executor** - The SS&SM executor CSC receives commands through the Intra-Comm C&DH CSC. It performs a validity check before executing the command. This CSC also maintains the state and Science Modes of the system, which is required by the mirror pointing and sun tracking CSCs. This CSC is present in the Boot-Loader and the operational software.

- **Mirror Pointing** - The mirror pointing CSC consists of two major functions: pointing determination and pointing control. The pointing and stabilizing control law determines the desired position of the steering mirror. The Steering Mirror Handler commands the mirror to the desired position. Actual position and desired position is reported in the engineering data transmitted to the ground. This CSC is present only in the operational software. *Note: As mentioned previously, the mirror pointing capability no longer exists; the steering mirror is now a fixed device. While the coding still exists, it is not expected to be recalled for future SOFIE operations.*

- **Sun Tracking** - The sun tracking CSC is the algorithm that determines the position of the sun image on the sun sensor. There are several modes of the algorithm including coarse sun location, coarse tracking, and fine tracking. This CSC is present only in the operational software.

3.6 DATA DECOMPOSITION

Data storage locations in the system are divided among its CSCIs. There are three basic data types used in the system: (1) data memory, (2) queue, and (3) shared memory.

- **Data Memory -** Data memory is generally a large memory location for the storage of data that must be randomly (rather than sequentially) available.

- **Queue -** A queue is a first-in-first-out data buffer. It is used to cache relatively small data transmissions that are accessed sequentially. Typically a queue can receive data from multiple sources but can only send data to a single source.

- **Shared Memory** - Shared memory is also used for relatively small data transmissions. Like the data memory, it is accessed randomly rather than sequentially. Opposite the queue, shared memory receives data from a single source and sends it to multiple sources.

3.6.1 C&DH Board Data

The C&DH Board has a Boot-Loader CSCI and an operational software CSCI. Data decomposition is similar to module decomposition. The Boot-Loader dataset is a subset of the operational software data. There are six data items in the Boot-Loader and fifteen items in the operational software.

The Boot-Loader uses the following data items:

- Command Queue
- Priority Command Queue
- Code Segment Queue
- Message Queue
- Test Procedure Queue
- Status & Error Queue.

The operational software uses the following data items:

- Command Queue
- Priority Command Queue
- Code Segment Queue
- Test Procedure Queue
- SS&SM Command Queue
- Priority SS&SM Command Queue
- Timed Command Queue
- Stored Commands Data Memory
- Message Queue
- Detector Buffer
- Pointing Buffer
- Diagnostics Data Queue
- Engineering Packet Buffer
- Science Packet Buffer
- Status & Error Queue

Note: The data items are listed in the following subsections based on type. The C&DH Board CSCIs include data queues & buffers, and data memory.

3.6.1.1 Data Queues & Buffers

- **Command Queue -** The C&DH Board software command queue receives pre-processed commands from the S/C Command CSC. It also receives commands from the Timing & Automation CSC and the C&DH Fault Tolerance CSC. Depending on the operational mode of the software, commands are retrieved and executed by one of the following CSCs: C&DH Executor, C&DH Test, or the Code Update CSC. Commands retrieved from this queue are executed upon receipt. Both the Boot-Loader and the operational software use this queue.

- **Priority Command Queue** - Commands that need to be executed immediately and cannot wait for other commands in the queue are transmitted to this portion of the command queue.

- **Test Procedure Queue** - Commands that run tests or memory dumps are routed to the Self-Test and Diagnostics CSCI through this buffer.

- **Code Segment Queue** - Snippets of uploaded code to be permanently stored in the EEPROM is transmitted to the Code Update CSCI through this queue.

- **SS&SM Command Queue -** Commands to be executed by the processor on the SS&SM Board are stored in this queue by the C&DH Executor. Commands are transmitted over the RS-422 link to the SS&SM Board. Both the Boot-Loader and the operational software use this queue.

- **SS&SM Priority Command Queue** - Commands to be executed, regardless of other commands in the command queue, are transmitted to this portion of the SS&SM Command Queue.

- **Timed Command Queue -** Timed commands received via the command pre-processor in the S/C Command CSC are transferred to this data queue to be retrieved by the Timing & Automation CSC and ordered for future execution. Macro commands received in the timed command queue are expanded before being stored for future execution. Only the operational software uses this queue.

- **Message Queue -** All data generated on the C&DH and SS&SM Boards are transmitted to this queue for sorting and formatting. There are many sources of data which are loaded into this queue, and then retrieved and processed by the Data Acquisition CSC. The operational software only uses this queue. In the Boot-Loader, all data will be stored in the engineering data queue for transmission to the ground.

- **Detector Buffer** - Detector data, which are captured by hardware, are time stamped by the task manager and moved to this memory buffer for transmission to the 1553 bus.

- **Tracking & Pointing Buffer** - Sun position data from the sun sensor and steering mirror pointing data received from the SS&SM Board are stored in this buffer for transmission to the 1553 bus.

- **Memory Dump Buffer -** Memory dumps are moved to this buffer for transmission to the spacecraft. This buffer transfers to the science packet buffer; therefore, a memory dump cannot be performed during science operations.

- **Test Procedure Data Queue -** All received messages and data which are not strongly typed and cannot be transmitted through the Engineering Packet Buffer nor the Science Packet Buffer, are placed in this data queue for collection and compiled into packets for the 1553 bus.

- **Engineering Packet Buffer** - State of Health (SoH) data are stored in this buffer under one APID. Additionally, a fixed number of engineering messages (*five are anticipated* forecasted) may be stored in this buffer under a separate APID.

- **Science Packet Buffer -** Only the operational software CSCI uses the science data queue. The data acquisition CSC separates engineering and science data. Science data are stored in this queue. The science data are collected from this queue by the S/C Data CSC and loaded into 1553 communication buffers for downlink to the operations center.

- **Status & Error Queue/Map -** This queue is present in the Boot-Loader CSCI and the operational software CSCI. All error messages from all sources (including the SS&SM Board) are transmitted to this queue. The C&DH Fault Tolerance CSC retrieves the messages as they arrive and determines the appropriate fault response.

3.6.1.2 Data Memory

- **Stored Commands Data Memory -** Timed commands collected via the Timed Command Queue by the Timing & Automation CSC are stored in this data memory. Macro commands are expanded before being stored. As time elapses, commands are pulled out of this data memory and moved to the command queue for execution. The data memory is periodically scrubbed to detect conflicts and illegal commands.

3.6.2 SS&SM Data

The SS&SM has two CSCIs, a Boot-Loader and its operational software. Like module decomposition, in data decomposition the Boot-Loader datasets are sub-sets of the operational software data. There are four data items in the Boot-Loader and eight data items in the operational software.

The Boot-Loader uses the following data items:

- Command Queue
- Priority Command Queue
- Data Queue
- Status & Error Queue.

The operational software uses the following data items:

- Command Queue
- Status & Error Queue

- Priority Command Queue
- Diagnostics Queue
- Data Queue
- State Shared Memory
- Tracking Shared Memory
- Pointing Shared Memory

Note: The data items are listed in the following subsections based on type. The SS&SM Board CSCIs includes data queues and shared memory. The SS&SM CSCIs do not use data memory.

3.6.2.1 Data Queues

- **Command Queue -** Commands received by the Intra-Comm C&DH CSC are stored in this queue, where they are acquired/retrieved, processed, and executed. Depending on the system state, functions are performed by either the SS&SM Executor CSC or the SS&SM Fault Tolerance CSC.

- **Priority Command Queue** - Commands to be executed immediately are transmitted via this portion of the command queue.

- **Test Procedure Queue** - Commands which cause tests to be run or command memory dumps, are routed to the Self-Test and Diagnostics CSCI through this buffer.

- **Steering Mirror Command Queue -** Commands transmitted to the Steering Mirror Handler are managed through this queue.

- **Steering Mirror Reply Queue -** Command replies from the Steering Mirror Handler are passed through this queue.

- **Data Queue -** The Intra-Comm C&DH CSC collects data from this queue and shared memory locations for transmission the C&DH Board for transmission to ground controllers. All data, aside from that in shared memory and that must be sent to the C&DH Board, are saved in this location.

- **Status & Error Queue -** All error conditions are reported in this queue, where the SS&SM Fault Tolerance CSC processes it. All error conditions are sent to the data queue for transmission to the ground. Fault responses can be generated on both boards as needed.

3.6.2.2 Shared Memory

- **State & Event Buffer -** Through this shared memory location, the SS&SM Command Executor communicates the system state to the Sun Tracking CSC and the mirror pointing CSC.

- **Pointing & Tracking Buffer -** Results generated by the sun-tracking algorithm in the Sun Tracking CSC are stored here where they can be collected by the Mirror Pointing CSC and the Intra-Comm C&DH CSC.

- **Pointing Shared Memories, Azimuth and Elevation -** Data generated by pointing and stabilizing functions of the Mirror Pointing CSC are stored in this shared memory

location so that it can be accessed by the Steering Mirror Handler (in the Mirror Pointing CSC) and the Intra-Comm C&DH CSC.

3.6.3 Boot Sequences

This section describes the boot sequence of the C&DH and the Sun Sensor Board (SSB).

3.6.3.1 C&DH

1. Power is supplied to the board (or the board is reset).
2. After initialization, the board enters a 30-second polling sequence. If more time is required, a command MUST be sent to reset the 30-second timer.
3. After 30 seconds, the board tries to load the EEPROM image.
4. If the board is unable to load the EEPROM image, it will try to load the PROM image.
5. If the board is unable to load the PROM image, it will return to and remain in the polling sequence.
6. If (and only if) the C&DH Board is able to load an operational image from either EEPROM or PROM, it will send an "are you alive" message to the SSB.
7. If (and only if) the SSB replies to the "are you alive" message, the C&DH Board will try to transfer the SSB EEPROM image to the SSB.
8. After transferring the EEPROM image to the SSB, the C&DH Board will send an "Operational Request" message to the SSB to ascertain if the SSB was able to load and run the Operational Software CSCI.
9. The C&DH Board will then enter Safe Mode

3.6.3.2 Sun Sensor Board

1. Power is supplied to the SSB (or the board is reset).
2. After initialization, the board enters a 40-second polling sequence.
3. While in the polling sequence, EVERY time the SSB reads a command from the command queue (VALID or NOT) the timer will reset to 40 seconds.
4. While in the polling sequence, if an EEPROM image is transferred from the C&DH Board the SSB will try to boot the transferred image.
5. If the board is unable to load the EEPROM image transferred from the C&DH Board, it will return to the 40-second polling sequence.
6. If the 40-second timer expires, the board will try to load the PROM image.
7. If the board is unable to load the PROM image, it will return and remain in the polling sequence.
8. If the board is able to load an Operational image, it will enter Standby Mode.

3.6.4 Time Synchronization

SOFIE time synchronization occurs when the C&DH Board enters Science Mode or when a Time Synchronization Self-Test and Diagnostic command is issued.

SOFIE time synchronization is coded into the SOFIE C&DH Science Mode software and functions as part of the standard C&DH Science Mode process. When the SOFIE software enters Science Mode, it will try (up to five times) to synchronize the time. If after five attempts it is unable to synchronize the time, it will no longer attempt to synchronize the time and will continue Science Mode processing until commanded to exit. All C&DH Board specific Science Mode functionality is active and available during the SOFIE time synchronization process.

When a Time Synchronization Self-test and Diagnostic command is issued, the SOFIE software will try to synchronize the time (and will only try once). Since the Self-test and Diagnostic command is stand-alone code that is executed asynchronously by the Self-test and Diagnostic Command Executor, all other SOFIE processing will be suspended until the SOFIE Time Synchronization Self-test and Diagnostic command has completed. Time synchronization is only attempted once to avoid suspending all other SOFIE processing for an inordinate amount of time.

Following is a brief description of the Relative Timer synchronization process:

- **C&DH**

  1. Send Quiet command to SSB and SSG boards.
  2. Wait 3 seconds in order to allow SSB and SSG boards to clear command buffers.
  3. Set C&DH Synch Relative Timer Flag.
  4. Next 20-Hz interrupt will send Time Sync command to SSB.
  5. Next 20-Hz interrupt will reset SSG and C&DH relative timers.
  6. Next 20-Hz interrupt will set flag to poll Sun Sensor High Priority Queue for SSB sync message.
  7. Update software status message with synch status.

- **Sun Sensor Board**

  1. When commanded, enter Quiet Mode.
  2. Poll High Priority Command Queue.
  3. When Time Sync command received, set Relative Timer Reset Flag.
  4. Next 20-Hz interrupt will reset relative timer.
  5. Next 20-Hz interrupt will send sync message to C&DH Board.
  6. Return to processing mode prior to being placed into Quiet Mode.

3.7 DEPENDENCY DESCRIPTION

The architecture of the SOFIE flight software is semi-data driven rather than task driven. As each task is called, it examines an incoming data queue to determine which of its functions to execute. In this manner, the data drives the execution of functional modules rather than the task manager; although, the task manager does control the execution order of the functional modules.

3.8 INTERDEPENDENCIES

The SOFIE software relies on the MIL-STD-1553B data bus for communications with the spacecraft. Through this interface, the software receives commands, transmits data, receives time synchronization signals (MSYNC) and receives maintenance updates.

The C&DH Board and the SS&SM Board depend on an RS-422 interface (redundant) for communications between the functional modules of the instrument. The SSG electronics also depend on an RS-422 interface to receive commands and transmit data to/from the SS&SM Board.

3.9 C&DH BOARD INTRA-DEPENDENCIES

The C&DH Board CSCIs depend on data queues and data buffers to transmit data between functional elements of the software.

3.9.1 Command Processing

Commands received via the 1553 interface are placed in a fixed memory location by hardware. The software 1553 command handler captures the commands and transfers them to the Timed Command Processor (timed commands) or the Command Queue (real-time commands).

On the 20-Hz timing interrupt signal, which is generated by hardware, the software generates a time-stamp and retrieves the detector data from a fixed memory location. Detector data is then transferred to a buffer where the Data Acquisition Handler can process it and prepare it for downlink through the 1553 interface.

Commands which must be processed by the SS&SM Board are transmitted over the RS-422 interface by the SS&SM Board Comm Handler though its command queue. Commands are received by the C&DH Board Comm Handler on the SS&SM Board. Data transmitted by the SS&SM Board to the C&DH Board follows the same path to return data via the 1553 interface.

3.9.2 Mode Control

On initial startup, the software goes into a safe state. In this state, the software transmits SoH engineering data, but does little else. The SOFIE software can only be transitioned out of this state by command from the 1553 interface. When this command is received, the software transitions into Standby Mode.

The instrument's own autonomy will transition the software from the Standby Mode into the Science Mode, where the science observation is made and the science data generated.

3.9.3 Data Acquisition

All acquired data are transmitted to ground operators through the spacecraft 1553 bus interface and its on-board storage (store-and-forward architecture). The Data Acquisition Handler receives data through queues and shared memory locations. It builds 1553 packets in separate buffers and queues, which are then retrieved by the 1553 Data Handler, finalized (primarily checksum calculation), and are transmitted over the 1553 interface.

3.9.4 Fault Response

Any process which encounters an error condition, will report the error to the Error Handler & Fault Response CSCI through the Status & Error queue. The Error Handler & Fault Response CSCI processes the error. In most instances, the error will simply be reported through the telemetry stream. In exceptional circumstances, the handler may inject a command into the command queue to abort a science observation or initiate Safe mode. *Note: The code is in-place to inject a command to abort or safe the instrument but no instances have been identified where this action is needed. Therefore there are no circumstances where this feature will be used.*

3.10 SS&SM BOARD INTRA-DEPENDENCIES

The SS&SM Board CSCIs depend on data queues and data buffers to transmit data between functional elements of the software.

3.10.1 Command Processing

Commands are received by the C&DH Board Comm Handler via the RS-422 interface. Commands are then transferred to the command queue for the Command Executor to retrieve and execute. The system state is stored in a shared memory location where all functions poll to determine what operations are to be performed.

3.10.2 Data Acquisition

Both the Sun Tracking CSCI and the Pointing Control CSCI store data in shared memory locations. All other data items are stored in the Data Queue. The Data Acquisition Handler acquires all data from the two shared memory locations and the queue, and prepares the data for transmission via the RS-422 by the C&DH Board Comm Handler.

3.10.3 Sun Tracking & Pointing Control

The sun tracking and pointing control CSCI determines the operational state through the state shared memory buffer, which is maintained by the Command Executor. Collected data are transmitted through shared memory locations which are read by the Data Acquisition Handler.

3.10.4 Fault Response

Any process encountering an error condition, will report the error condition to the Error Handler & Fault Response CSCI through the Status & Error queue. The Error Handler & Fault Response CSCI will process the error. In most instances, the error will simply be reported through the telemetry stream. In exceptional circumstances, the handler may inject a command into the command queue to abort a science observation or safe the instrument. *Note: The code is in-place to inject a command to abort or safe the instrument but no instances have been identified where this action is needed. Therefore there are no circumstances where this feature will be used.*

4 NORMAL OPERATIONS

Under normal conditions, the sensor will operate by established command sequences in an event table. *See Appendix A for examples of sunrise and sunset event tables.*

4.1 COMMANDING RULES

Refer to the Command and Telemetry Handbook included in Appendix B of this manual.

4.2 TABLE RELATED COMMANDS

4.2.1 General Commands Useful for Tables

dump_EEPROM – May be used to dump up to 467 words of any table contained in EEPROM

dump_cdh_sram1 – May be used to dump up to 467 words of any data contained in upper or lower SRAM on the C&DH

dump_ssb_sram1 – May be used to dump up to 256 words of any data contained in upper or lower SRAM on the SSB

4.2.2 C&DH Image Date – begins at 0xe50 (in lower SRAM) – Image date (revision code) of image currently executing on the C&DH

Format:

0xe50 - Year

0xe51 – Month

0xe52 – Date

0xe53 – Revision number for day (beginning with 0)

dump_cdh_sram1 with lwr_sram_flag 1, address x#e50, length 4

4.2.3 SSB Image Date – begins at 0x820 (in lower SRAM) – Image date (revision code) of image currently executing on the SSB

Format:

0x820 - Year

0x821 – Month

0x822 – Date

0x823 – Revision number for day (beginning with 0)

dump_ssb_sram1 with lwr_sram_flag 1, address x#820, length 4

4.2.4 C&DH Code Image (in EEPROM) – normally resides at OD address 8, starting at address 0

pass_codeload2 – Code upload to reprogram the EEPROM image

use_cdh_image – Select which copy of C&DH code image to use

test_ee_chksum – Performs a checksum test of an image in EEPROM

4.2.5 SSB Code Image (in EEPROM) – normally resides at OD address 9, starting at address 0

pass_codeload2 – Code upload to reprogram the EEPROM image

use_ssb_image – Select which copy of Sun Sensor Board code image to use

test_ee_chksum – Performs a checksum test of an image in EEPROM

4.2.6 Science Event Table – contains start times and event command table numbers for up to 256 events

set_sci_evt_tbl – Initialize the science event table with 256 event entries

get_event_info – Get information (start time, and event command table number) for a specific event

get_next_event – Get the start and ending event numbers currently in the science event table, and start time and event command table number for the next event

set_sunris_event – Set the start time and event command table number for a specific event

set_sunset_event – Set the start time and event command table number for a specific event

4.2.7 Timed Command Table – contains up to 100 timed commands

reset_tc_table – Reset (flush) timed command table

reset_tc_entry – Delete a timed command entry

reset_tc_range – Delete a range of commands from the timed command table

Note: Timed commands are added to the timed command table by up-linking timed commands or executing science events

4.2.8 Sun Sensor Algorithm Initialization Table (subset of the SSB state & event table)

pass_ssainit_tbl – Pass sun sensor tracking algorithm initialization table

4.2.9 Event Command Tables – Tables of commands, azimuth tables, and elevation tables. Numbered 1 through 63, the tables are stored in EEPROM (OD address 0xe – primary,

OD addreff 0xf – backup). Each table is 1 kword in size. Table 1 starts at 0x400, table 2 at 0x800, etc.

pass_codeload2 – Code upload to reprogram the EEPROM image

pass_ss_aztable – Transmit sun sensor az table. This command should not normally be used by Ground Ops. The az table is normally passed to the SSB as part of a science event.

pass_ss_eltable – Transmit sun sensor el table. This command should not normally be used by Ground Ops. The el table is normally passed to the SSB as part of a science event.

4.2.10 C&DH Error Map – A bit-map of errors which have been detected by the C&DH

reset_error_map – Clear C&DH error map

4.2.11 SSB Error Map – A bit-map of errors which have been detected by the SSB

reset_ssb_error – Clear SSB error map

4.3 SOFIE EVENT SETUP

4.3.1 Set Up the Command Event Table in EEPROM

This should consist of a primary table in EEPROM_BANK_7 and an identical (backup table) in EEPROM_BANK_8. This will include all the commands to be executed during the event as well as the tracking azimuth & elevation tables.

EEPROM_BANK_7 corresponds to OD address 0xE, and EEPROM_BANK_8 corresponds to OD address 0xF.

Use the stand-alone table generating program written by GATS to create and check this table.

This program is called "Event Table Creator".

4.3.2 Upload the Generated Command Table using the "pass_codeload2 command"

Use the generated .prc file to write the data to EEPROM.

4.3.3 Execute the *set sofie sci_evt_tbl* Command.

This requires a starting event number which can be any number; but is suggested that while on-orbit, the event number be the next sequential number after a reset (or a power down) so that the events numerically continue where they left off. The flight code is set-up as a circular queue. Once an event has finished, space is setup for the next event. *Note that if you rerun this command, you will lose any entries that have been previously setup*.

Steps 4.3.1.1 through 4.3.1.3 only need to be performed once each time SOFIE is powered on or reset. After that, many events can be setup.

4.3.4 Set Up Future Event.

Next, use either a *set sofie sunset_event* command or *set sofie sunris_event* command to setup a future event. The function of these two commands is actually identical; however, both are provided so the intended operation can be identified via the opcode. The parameters for these two commands are:

eventNo - This event number should be equal to or greater than the starting event number identified in the *set sofie sci_evt_tbl* command. The table maintains a maximum of 256 events.

eventTime - Time in total seconds. This is the start time of the event.

table - The command event table number to use. *This is what was set up in steps 4.3.1.1 & 4.3.1.2.*

Note: The processing for the event actually begins two minutes before the start of the event. Two minutes before eventTime, the commands are copied to the timed command table, and the azimuth & elevation tables are copied to the sun sensor. As a result, events

cannot begin within two minutes of each other. For practical purposes, this is not a problem since there is normally a sunrise event and a sunset event.

4.3.5 Examine the Data. There are two additional commands provided for examining data in the event table:

get sofie event_info - Use this to retrieve the start time and table number for an event.

get sofie next_event - This retrieves the event number, start time, and table number for the next event. It also returns the range of event numbers found in the table (i.e. start event and end event).

4.3.6 Event and Table Issues

The flight software does not check the maximum number of parameters for commands in the science event tables like it does when commands are issued in real time. The operator must check to ensure:

- The number of parameters does not exceed the maximum value (four).
- The combined sizes of the azimuth, elevation, and command table sizes are consistent with the total size of the table. *Note: The science event table size consistency is only checked in the table creation tool.*
- The total table size is not greater than 1024 words. The azimuth and elevation tables are no longer relevant for SOFIE operations because the steering mirror assembly is now a fixed hardware system.

4.3.7 Calibration

This section will be updated.

4.3.8 Testing

There are three general purpose test procedures and one specialized test procedure provided to verify functions of the SOFIE instrument.

4.3.9 Aliveness Test - *sofie_atp.prc*

This short test procedure provides a quick verification that the SOFIE instrument is powered on and major components are functioning. It does not command the instrument into Science Mode.

4.3.10 Limited Functional Test - *sofie_ftp.prc*

This test procedure verifies the same functions as the aliveness test. It also performs a checksum test on the operational images of both the C&DH the SS&SM in SRAM and EEPROM. It then enables the detector temperature controllers and goes into Science Mode for a short science data collection.

4.3.11 Comprehensive Functional Test - *sofie_ctp.prc*

This test verifies all of the real-time functions of the SOFIE instrument real-time commands. It does not verify the function of timed commands or image uploads. It verifies all reset functions, diagnostic commands, image dump commands, and science data commands.

4.3.12 Software Test Procedure - *sofie_stp.prc*

This is the most comprehensive of the four test procedures. This test consists of nineteen separate test procedures provided to verify the function of the SOFIE software commands. These tests include the timed commands, error messages, image upload functions, and aperture cover release safety functions.

4.4 COMMISSIONING

Table 3. Possible Commissioning Sequence

Date Requested	Date Comments	Procedure Name	Primary Script	Sub Scripts
Launch + 8 days	Delay for spacecraft checkout	SOFIE Turn-on		
			sof_turn_on	
				get_sys_pkt
				sof_hk_zero
				sof_sys_zero
				sof_pkt_zero
				all_tec_on
				all_tec_off
				vfy_safe_cdh
				vfy_standby_cdh
				vfy_standby_ssb
				vfy_version
				snap_pic
Launch + 8 days	Delay for spacecraft checkout	VerifyMemory		
			vfy_memory	
				get_sys_pkt
Launch + 8 days	Delay for spacecraft checkout	MemoryDump		
			dump_memory	
				get_sys_pkt
Launch + 9 days	Delay for verification of SOFIE memory	Aliveness Test		
			sofie_atp	
				get_sys_pkt
				sof_hk_eng
				sof_sys_eng
				sof_hk_zero

Table 3. Possible Commissioning Sequence

Date Requested	Date Comments	Procedure Name	Primary Script	Sub Scripts
				sof_sys_zero
				sof_pkt_zero
				check_errors
				vfy_version
Launch + 9 days	Delay for initial instrument checkout	ObservationUpload		
			upload_events	
Launch + 10 days	Delay for spacecraft outgassing	CoverDeployment		
			cover_deploy	
				sof_relcov_a1
				sof_relcov_a2
				sof_relcov_b1
				sof_relcov_b2
Launch + 10 days	Delay for internal instrument outgassing	ObservationUpload		
			upload_events	upload_events

5 BASIC DIAGNOSTIC / TROUBLESHOOTING

Basic troubleshooting should be approached by examining the system messages and error messages contained in the system data packet. All available messages will appear in the free-format portion of the system packet. All error conditions will be flagged in the error map portion of the system packet. The error map is available as regular telemetry and is displayed in the system data packet display page.

More detailed troubleshooting may be performed by using the sixteen supplied SOFIE Test Commands. These commands are:

get sofie cdh_reg	Query the contents of a CDH FPGA register
get sofie ssb_reg	Query the contents of an SSB FPGA register
get sofie cdh_sram	Query the contents of a CDH memory location
get sofie ssb_sram	Query the contents of an SSB memory location
test sofie ee_chksum	Perform a checksum of a code image in EEPROM
test sofie cdh_chksum	Perform a checksum of the CDH image running in SRAM
test sofie ssb)chksum	Perform a checksum of the SSB image running in SRAM
test sofie cdh_sram1	Perform a pattern test of CDH data (operand) SRAM
test sofie cdh_sram2	Perform a pattern test of CDH instruction SRAM
test sofie ssb_sram1	Perform a pattern test of SSB data (operand) SRAM
test sofie ssb_sram2	Perform a pattern test of SSB instruction SRAM
dump sofie EEPROM	Dump selected portion of EEPROM memory
dump sofie cdh_sram1	Dump selected portion of CDH data (operand) SRAM
dump sofie cdh_sram2	Dump selected portion of CDH instruction SRAM
dump sofie ssb_sram1	Dump selected portion of SSB data (operand) SRAM
dump sofie ssb_sram2	Dump selected portion of SSB instruction SRAM

Refer to the *Command & Telemetry Handbook* included at the end of this manual for detailed information on each of these commands.

5.1 SOFIE SYSTEM MESSAGES

This section contains the SOFIE non-error message codes that will appear in the free-format portion of the system-data packet.

5500	**SSG Echo Command Response**
	Description ▪ Message generated by the SSG board. ▪ It is the response to the SSG echo command.
	Presentation ▪ Presented as a 5500 in the free-format portion of the SOFIE system data packet followed by the parameter count (1, 2, or 3), and up to three data words. ▪ Echoes an exact copy of the data words sent to SSG via the echo command.
5501	**SSG Enable Servos Command Response**
	Description ▪ Generated by the SSG board. ▪ After completing servo initialization (initiated by an SSG enable_servos command), the SSG hardware responds with this message to indicate that it is ready to receive commands.
	Presentation ▪ Presented as a 5501 in the free-format portion of the SOFIE system data packet.
5503	**SSG Reset Command Response**
	Description ▪ Generated by the SSG board. ▪ After completing a reset, the SSG hardware responds with this message indicating that it is ready to receive commands.
	Presentation ▪ Presented as a 5503 in the free-format portion of the SOFIE system data packet.
5511	**SSG State Message**
	Description ▪ Generated by the SSG board. ▪ This message consists of the current SSG state information. ▪ Time (1 word), Commands executed (1 word), Commands failed (1 word), Azimuth Coil Current (1 word), Elevation Coil Current (1 word), and State Bits (1 word). ▪ Due to time synchronization considerations, this message is normally returned by SSG at the rate of 1 Hz. However, it is filtered down by a factor of 15 by the Steering Mirror Handler. As a result, if the rate of this message is modified it will actually appear in telemetry at 1/15 of the specified rate.
	Presentation ▪ Presented as a 5511 in the free-format portion of the SOFIE system data packet followed by the parameter count (6), and the six data words described.
5513	**SSG get_ssg_posit Command Response**
	Deiscription ▪ Generated by the SSG board. ▪ In response to an SSG Get Position command, the SSG hardware responds with this position information message. ▪ Time (1 word), Azimuth (1 word), Elevation (1 word)
	Presentation ▪ Presented as a 5513 in the free-format portion of the SOFIE system data packet followed by the parameter count (3), and the three data words described.

5514	**SSG Get PIDRegisters Command Response**
	Description ▪ Generated by the SSG board. ▪ In response to an SSG GetPIDRegisters command, SSG returns the eight gain values. ▪ AzP (1 word), AzI (1 word), AzD (1 word), AzFF (1 word), ElP (1 word), Ell (1 word), ElD (1 word), ElFF (1 word)
	Presentation ▪ Presented as a 5514 in the free-format portion of the SOFIE system data packet followed by the parameter count (8), and the eight data words described.
5521	**SSG Set PIDRegisters Command Response**
	Description ▪ Generated by the SSG board. ▪ In response to an SSG SetPIDRegisters command, the SSG hardware responds with the new PID register values. ▪ AzP (1 word), AzI (1 word), AzD (1 word), AzFF (1 word), ElP (1 word), Ell (1 word), ElD (1 word), ElFF (1 word).
	Presentation Presented as a 5521 in the free-format portion of the SOFIE system data packet followed by the parameter count (8), and the eight data words described.
55F0	**SSG Peek Command Response**
	Description ▪ Generated by the SSG board. ▪ In response to an SSG Peek command the SSG hardware responds with the requested address and its corresponding value. ▪ Address (1 word), Value (1 word)
	Presentation ▪ Presented as a 55F0 in the free-format portion of the SOFIE system data packet followed by the parameter count (2), and the two data words described.
55F1	**SSG Poke Command Response**
	Description ▪ Generated by the SSG board. ▪ In response to an SSG Poke command, the SSG hardware echoes the address and provides the register's previous value and its new value. ▪ Address (1 word), Old Value (1 word), New Value (1 word)
	Presentation ▪ Presented as a 55F1 in the free-format portion of the SOFIE system data packet followed by the parameter count (3), and the three data words described.
BB01	**Reprogram EEPROM Image**
	Description ▪ This is the reprogram EEPROM image command response. *Note that the command response is different for the flight PROM versus EEPROM images. This command response was modified by SCR044.* ▪ PROM Image: Opcode (1 word), OD address (1 word), Start address (1 word), packet length (1 word). ▪ EEPROM images: OD address (1 word), start address (1 word).
	Presentation ▪ Presented as a BB01 in the free-format portion of the SOFIE system data packet followed by the parameter count (4 or 2), and the data words described.

BB02	**Reprogram C&DH SRAM Image**
	Description ▪ This is the reprogram C&DH SRAM image command response. *Note that the command response is different for the flight PROM versus EEPROM images. This command response was modified by SCR044.* ▪ PROM Image: Opcode (1 word), OD address (1 word), Start address (1 word), packet length (1 word). ▪ EEPROM images: OD address (1 word), start address (1 word).
	Presentation ▪ Presented as a BB02 in the free-format portion of the SOFIE system data packet followed by the parameter count (4 or 2), and the data words described.
BB03	**Reprogram SSB SRAM Image**
	Description ▪ This is the reprogram SSB SRAM image command response. *Note that the command response is different for the flight PROM versus EEPROM images. This command response was modified by SCR044.* ▪ PROM Image: Opcode (1 word), OD address (1 word), Start address (1 word), packet length (1 word). ▪ EEPROM images: OD address (1 word), start address (1 word).
	Presentation ▪ Presented as a BB03 in the free-format portion of the SOFIE system data packet followed by the parameter count (4 or 2), and the data words described.
BB2F	**Setup Science Event Table**
	Description ▪ This is the command response for the setup Science Event Table command including the starting event number.
	Presentation ▪ Presented as a BB2F in the free-format portion of the SOFIE system data packet followed by the parameter count (1) and starting event number.
BB40	**SOFIE Power Down**
	Description ▪ This is the command response from either the inform sofie pwrdown or turn off_all commands. *Note; however, that this is not reported by the C&DH PROM image. When either of these commands is issued the 1553 comms check is disabled. See error code 0x4109 and AIM-900 section 3.6.1 for more information.*
	Presentation ▪ Presented as a BB40 in the free-format portion of the SOFIE system data packet.
BB4B	**Delete an Entry From the Timed Command Table**
	Description ▪ This is the response for a timed command table entry deletion including the absolute command time in total seconds (2 words) and the opcode of the deleted command.
	Presentation ▪ Presented as a BB4B in the free-format portion of the SOFIE system data packet followed by the parameter count (3), command time, and the command opcode.
BB4C	**Delete Commands from the Timed Command Table over a Range of Times** (inclusive)
	Description ▪ This is the response for a range of timed command table entry deletions. It includes the absolute start time (in total seconds) of deleted timed command range (2 words), absolute end time (in total seconds) of deleted timed command range (2 words), and number of timed commands deleted (1 word).
	Presentation ▪ Presented as a BB4C in the free-format portion of the SOFIE system data packet followed by the parameter count (5), and the data words described.

BB4D	**Get Event Information for a Specific Event**
	Description ▪ This is the command response for the get event information command including the event number (1 word), event time in total seconds (2 words), and event command table number (1 word).
	Presentation ▪ Presented as a BB4D in the free-format portion of the SOFIE system data packet followed by the parameter count (4), and the data words described.
BB4E	Get next event information
	Description ▪ This is the command response for the *get next* event information command including the starting event number in the event table (1 word {same as next event}), the last event number in the event table (1 word), the next event number (1 word {same as starting event number in event table}), the event time in total seconds (2 words), and the event command table number (1 word).
	Presentation ▪ Presented as a BB4E in the free-format portion of the SOFIE system data packet followed by the parameter count (6), and the six data words described.
BB60	**Setup Sunset Event**
	Description ▪ This is the command response for the setup sunset event command including the event number (1 word), the event time in total seconds (2 words), and the event command table number (1 word).
	Presentation ▪ Presented as a BB60 in the free-format portion of the SOFIE system data packet followed by the parameter count (4), and the four data words described.
BB61	**Setup Sunrise Event**
	Description ▪ This is the command response for the setup sunrise event command including the event number (1 word), the event time in total seconds (2 words), and the event command table number (1 word).
	Presentation ▪ Presented as a BB61 in the free-format portion of the SOFIE system data packet followed by the parameter count (4), and the four data words described.
BB80	**C&DH Echo**
	Description ▪ This is the response to a C&DH echo command.
	Presentation ▪ Presented as a BB80 in the free-format portion of the SOFIE system data packet. ▪ There are no additional parameters in the free-format portion. ▪ The opcode is returned in the Latest Single Word Response field and the Latest Single Word Opcode fields of the system data display page.
BBA0	**Get C&DH FPGA Register Value**
	Description ▪ This is the command response to the Get C&DH FPGA Register Value command including the OD Address (1 word), the register address (1 word), and the register value (1 word).
	Presentation ▪ Presented as a BBA0 in the free-format portion of the SOFIE system data packet followed by the parameter count (3), and the three data words described. ▪ The value and the opcode are also returned in the Latest Single Word Response field and the Latest Single Word Opcode fields of the system data display page.

BBA2	**Code Image Checksum**
	Description ▪ This is the command response for the Code Image Checksum command including the checksum from memory (1 word), and the computed checksum for the image (1 word).
	Presentation ▪ Presented as a BBA2 in the free-format portion of the SOFIE system data packet followed by the parameter count (2), and the two data words described. ▪ The computed checksum value and the opcode are also returned in the Latest Single Word Response field and the Latest Single Word Opcode fields of the system data display page.
BBA3	**This message is not used**
	Description ▪ This command and message has been removed.
	Presentation ▪ none
BBA4	**C&DH Data (Operand) SRAM Pattern Test**
	Description ▪ This is the command response to the C&DH Data (Operand) SRAM Pattern Test command including the error count.
	Presentation ▪ Presented as a BBA4 in the free-format portion of the SOFIE system data packet followed by the parameter count (1), and the error count. ▪ The SRAM address locations which exhibit an error are also stored in upper SRAM. (OD_address 0) beginning at location B780.
BBA5	**C&DH Data (Instruction) SRAM Pattern Test**
	Description ▪ This is the command response to the C&DH Data Instruction SRAM Pattern Test command including the error count.
	Presentation ▪ Presented as a BBA5 in the free-format portion of the SOFIE system data packet followed by the parameter count (1), and the error count. ▪ The SRAM address locations which exhibit an error are also stored in upper SRAM (OD_address 0) beginning at location B780.
BBAA	**Read value from C&DH lower data SRAM**
	Description ▪ This is the command response for the read value from C&DH lower data SRAM command including the lower data SRAM address (1 word), and the value (1 word).
	Presentation ▪ Presented as a BBAA in the free-format portion of the SOFIE system data packet followed by the parameter count (2), and the two data words described. ▪ The value and the opcode are also returned in the Latest Single Word Response field and the Latest Single Word Opcode fields of the system data display page.
DD80	**SSB Echo**
	Description ▪ Command response to an SSB echo command.
	Presentation ▪ Presented as a DD80 in the free-format portion of the SOFIE system data packet. ▪ There are no additional parameters in the free-format portion. ▪ The opcode is returned in the Latest Single Word Response field and the Latest Single Word Opcode fields of the system data display page.

DD81	**SSB High-Priority Echo**
	Description ▪ Command response to an SSB high-priority echo command.
	Presentation ▪ Presented as a DD81 in the free-format portion of the SOFIE system data packet. ▪ There are no additional parameters in the free-format portion. ▪ The opcode is returned in the Latest Single Word Response field and the Latest Single Word Opcode fields of the system data display page.
DDA0	**Get SSB FPGA Register Value**
	Description ▪ This is the command response for the Get SSB FPGA Register Value command including the OD Address (1 word), the register address (1 word), and the register value (1 word).
	Presentation ▪ Presented as a DDA0 in the free-format portion of the SOFIE system data packet followed by the parameter count (3), and the three data words described. ▪ The opcode and the value are also returned in the Latest Single Word Response field and the Latest Single Word Opcode fields of the system data display page.
DDA1	**SSB Data (Operand) SRAM Pattern Test**
	Description ▪ This is the command response to the SSB Data (Operand) SRAM Pattern Test command including the error count.
	Presentation ▪ Presented as a DDA1 in the free-format portion of the SOFIE system data packet followed by the parameter count (1), and the error count. ▪ The SRAM address locations which exhibit errors are also stored in upper SRAM. (OD_address 0) beginning at location x#4380.
DDA2	**SSB Data (Instruction) SRAM Pattern Test**
	Description ▪ Command response for the SSB Data Instruction SRAM Pattern Test command including the error count.
	Presentation ▪ Presented as a DDA2 in the free-format portion of the SOFIE system data packet followed by the parameter count (1), and the error count. ▪ The SRAM address locations which exhibit errors are also stored in upper SRAM. (OD_address 0) beginning at location x#4380.
DDA7	**Read value from SSB lower data SRAM**
	Description ▪ Command response for the read value from SSB lower data SRAM command including the lower data SRAM address (1 word), and the value (1 word). ▪ The value and the opcode are also returned in the Latest Single Word Response field and the Latest Single Word Opcode fields of the system data display page.
	Presentation ▪ Presented as a DDA7 in the free-format portion of the SOFIE system data packet followed by the parameter count (2), and the two data words described. ▪ The value and the opcode are also returned in the Latest Single Word Response field and the Latest Single Word Opcode fields of the system data display page.
EE00	**C&DH Status Registers**
	Description ▪ This message contains the information from the C&DH status registers (R14 and R15). (Bit 0 is the LSB) Bits 0 - 5: Interrupts Counter, Bits 6 - 9 Mode, Bits 10 - 13 Sequence, Bit 14 1 Hz interrupts flag, Bit 15 20 Hz interrupts flag, Bits 16 - 19 Error code,

	Bit 20 Relative Timer Sync Flag, Bit 21 Sync Relative Timer Flag, Bit 22 Reset Relative Timer Flag, Bit 23 Relative Timer Sync in Progress Flag, Bit 24 SSB quiet flag, Bit 25 Read Sync Flag, Bit 26 Test Sync flag, Bit 27 Spare, Bit 28 SSB image loaded flag, Bit 29 SSB operational flag, Bit 30 interrupt 0 flag, Bit 31 interrupt 5 flag. Mode bits definition: 1 - Safe Mode, 2 - Standby Mode, 4 - Science Mode, 8 - Quiet mode, C - Science Mode - send data. Sequence bits definition: 1 - Boot-Loader Polling, 2 - Boot-Loader Load, 4 - Boot loader test, 8 - Operational CSCI test. Error bits definition: 1 - Software image checksum error. Information for these registers is also displayed in the Task Status for CDH.
	Presentation ▪ Presented as an EE00 in the free-format portion of the SOFIE system data packet followed by the parameter count (2), and the two data words described. ▪ The data are also displayed in the CDH Task Status field of the system data display page.
EE01	**SSB Status Message - High Priority**
	Description ▪ This is the SSB response to the C&DH "are you alive" command (opcode 0xDD42). This response signifies that the SSB is "alive".
	Presentation ▪ Presented as an EE01 in the free-format portion of the SOFIE system data packet.
EE02	**SSB Operational Status Message - High Priority**
	Description ▪ After the C&DH Board sends an operational code image to the SSB, it then sends SSB operational request commands to the SSB (opcode 0xDD43). In response, the SSB sends this message to indicate that the SSB is operational.
	Presentation ▪ Presented as an EE02 in the free-format portion of the SOFIE system data packet.
EE03	**SSB Relative Timer Sync Message - High Priority**
	Description ▪ This message is sent from the SSB to the C&DH Board to indicate that the SSB time was successfully synchronized.
	Presentation ▪ Presented as an EE03 in the free-format portion of the SOFIE system data packet.

EE04	**C&DH Time Message**
	Description ▪ This message is sent from within the C&DH 20-Hz ISR during the cycle following C&DH time synchronization. It contains the absolute and relative times. Word 1 - high 16bits of seconds counter (SEC_HI_CNT), Word 2 - low 16 bits of seconds counter (SEC_LO_CNT), Word 3 - high 16 bits of fractional-seconds counter (SUBSEC_HI_CNT), Word 4 - low 16 bits of fractional-seconds counter (SUBSEC_LO_CNT), Word 5 - C&DH relative timer.
	Presentation ▪ Presented as an EE04 in the free-format portion of the SOFIE system data packet followed by the parameter count (5), and the five data words described.
EE05	**SSB Time Message**
	Description ▪ This message is sent from within the SSB 20-Hz ISR during the cycle following SSB time synchronization. It contains the SSB relative timer.
	Presentation ▪ Presented as an EE05 in the free-format portion of the SOFIE system data packet followed by the parameter count (1), and the SSB relative timer.
EE06	**C&DH 20-Hz Time Message**
	Description ▪ This message is sent from within the C&DH 20-Hz ISR two cycles after the time synchronization has occurred. It contains the 20-Hz interrupt count. *Note: This message is mainly useful for verification of C&DH time synchronization.*
	Presentation ▪ Presented as an EE06 in the free-format portion of the SOFIE system data packet followed by the parameter count (1), and the 20-Hz interrupt count.
EE07	**SSB 20-Hz Time Message**
	Description ▪ This message is sent from within the SSB 20-Hz ISR two cycles after the time synchronization has occurred. It contains the 20-Hz interrupt count. *Note: This message is mainly useful for verification of SSB time synchronization.*
	Presentation ▪ Presented as an EE07 in the free-format portion of the SOFIE system data packet followed by the parameter count (1), and the 20-Hz interrupt count.
EE10	**SSB Software Status**
	Description ▪ This message contains the information from the C&DH status registers (R14 and R15). It is nominally sent at the rate of 1/15-Hz. *Note that some of the bit values are not carried across from the Boot-Loader to the operational SSB. In other words, some of the values are only present during the time that the SSB is in the Boot-Loader.* (Bit 0 is the LSB) Bits 0 - 5: Interrupts Counter, Bits 6 - 9 Mode, Bits 10 - 13 Sequence, Bit 14 - 1 Hz interrupts flag, Bit 15 - 20 Hz interrupts flag, Bits 16 - 19 Error code, Bit 20 - Relative Timer Sync Flag, Bit 21 - Sync Relative Timer Flag, Bit 22 - Relative Timer Reset Flag, Bit 23 - Relative Timer Sync in Progress Flag, Bit 24 - SSB quiet flag, Bit 25 - Read Sync Flag, Bit 26 - Test Sync flag, Bit 27 - 100 Hz interrupts flag,

	Bit 28 - SSB image loaded flag, Bit 29 - SSB operational flag, Bit 30 - interrupt 0 flag, Bit 31 - interrupt 5 flag. Mode bits definition: 2 - Standby Mode, 4 - Science Mode, 8 - Quiet mode. Sequence bits definition: 1 - Boot-Loader Polling Sequence, 2 - Boot-Loader Load Sequence, 4 - Boot loader test sequence, 8 - Operational CSCI test sequence. Error bits definition: 1 - Software image checksum error, 2 - EEPROM software image checksum error. ▪ Information for these registers is also displayed in the Task Status for SSB.
	Presentation ▪ Presented as an EE10 in the free-format portion of the SOFIE system data packet followed by the parameter count (2), and the two data words described. ▪ The data are also displayed in the SSB Task Status field of the system data display page.

5.2 SOFIE ERROR MESSAGES

This section lists the error messages by bit value as they would appear in the error map portion of the system packet. The **bold text** indicates the SOFIE system display page field name. The SOFIE telemetry word identifier is in parenthesis. The relevant errors are listed by their error map bit value followed by the error label. The error code follows next. Refer to the following section for a complete description of the error messages as they would appear in the free-format portion of the system data packet.

5.2.1 System Critical (SYS_CRITICAL_ERR)

EQU NULL_CODE 0C0DEH

5.2.2 C&DH Critical (CDH_CRITICAL_ERR)

1 X40_DUST_COVER_TIMEOUT 04000H

5.2.3 C&DH Init and Task Manager (CDH_I_T_ERR)

1 X41_NO_CHOPPER_ENABLED 04100H
2 X41_BAD_IMAGE_CHECKSUM 04101H
4 X41_SRAM_ERROR 04102H
8 X41_PRI_SSA_INIT_TABLE_BAD_CHECKSUM 04103H
10 X41_UNABLE_TO_READ_PRI_SSA_INIT_TABLE 04104H
20 X41_PRI_SSA_INIT_TABLE_EMPTY 04105H
40 X41_SEC_SSA_INIT_TABLE_BAD_CHECKSUM 04106H
80 X41_UNABLE_TO_READ_SEC_SSA_INIT_TABLE 04107H
100 X41_SEC_SSA_INIT_TABLE_EMPTY 04108H
200 X41_1553_COMMS_FAILED 04109H

1553 Command Handler (M1553_CMND_ERR)

1 X42_INVALID_LENGTH 04200H
2 X42_BAD_CHECKSUM 04201H
4 X42_INVALID_SID 04202H

5.2.4 Command Pre-Processor (CMND_PREPROC_ERR)

There are no error messages defined for this section.

5.2.5 C&DH Self-Test & Diagnostics (CDH_ST_DIAG_ERR)

2 X44_MEM_DUMP_HANDLER_INVALID_OPCODE 04401H
4 X44_EEPROM_DUMP_TOO_FEW_PARAMETERS 04402H
8 X44_EEPROM_DUMP_TOO_MANY_PARAMETERS 04403H
10 X44_CDH_DATA_DUMP_TOO_FEW_PARAMETERS 04404H
20 X44_CDH_DATA_DUMP_TOO_MANY_PARAMETERS 04405H
40 X44_CDH_CODE_DUMP_TOO_FEW_PARAMETERS 04406H

80 X44_CDH_CODE_DUMP_TOO_MANY_PARAMETERS 04407H
100 X44_EEPROM_DUMP_REQUEST_SIZE_TRUNCATED 04408H
200 X44_EEPROM_DUMP_UNABLE_TO_COPY_DATA 04409H
400 X44_CDH_DATA_DUMP_REQUEST_SIZE_TRUNCATED 0440AH
800 X44_CDH_CODE_DUMP_REQUEST_SIZE_TRUNCATED 0440BH
1000 none 0440CH
2000 none 0440DH
4000 X44_INVALID_CMD_CODE 0440EH
8000 X44_INVALID_FPGA_BANK 0440FH
10000 X44_BAD_IMAGE_CHECKSUM 04410H
20000 X44_WRITE_LEN_GT_3 04411H
40000 X44_TEST_EE_CHKSUM_ERROR_READING_EEPROM 04412H

5.2.6 Code Updater (CODEUPDATE_ERR)

1 CODEUPD_ERR_OK 00000H
2 X45_CODEUPD_INCORRECT_COMMAND_SIZE 04501H
4 CODEUPD_ERR_ODMIN 04502H
8 CODEUPD_ERR_ODMAX 04503H
10 CODEUPD_ERR_LENGMIN 04504H
20 CODEUPD_ERR_LENGMAX 04505H
40 CODEUPD_ERR_CKSUM 04506H
80 CODEUPD_ERR_OPCODE 04507H
100 CODEUPD_ERR_IMPLEMENT 04508H
200 CODEUPD_ERR_PAGE 04509H
400 X45_E2WRITE_ERR_LSB_EEPROM_BUSY 0450AH
800 X45_E2WRITE_ERR_MSB_EEPROM_BUSY 0450BH
1000 X45_E2WRITE_ERR_CTRL_EEPROM_DISABLED 0450CH
2000 X45_E2READ_ERR_LSB_EEPROM_BUSY 0450DH
4000 X45_E2READ_ERR_MSB_EEPROM_BUSY 0450EH
8000 X45_E2READ_ERR_CTRL_EEPROM_DISABLED 0450FH

5.2.7 C&DH Error Handler & Fault Response (CDH_EH_FR_ERR)

2 X46_INVALID_ERROR_CODE 04601H
4 X46_ERROR_CODE_OUT_OF_RANGE 04602H

5.2.8 1553 Data Handler (M1553_DATA_ERR)

1 X47_ENGDAT_SC_NOT_READY 04700H
(S/C has not read previous buffer)
2 X47_1553_ENG_BUFFER_NOT_SERVICED 04701H

5.2.9 C&DH Command Executor (CDH_CMNDEXEC_ERR)

2 X48_INVALID_CMD_CODE 04801H
4 X48_INVALID_SEQ 04802H
8 X48_INVALID_FPGA_BANK 04803H

10 X48_INVALID_SET_1553_CHKSMV_PARAM 04804H
20 X48_INVALID_SET_EVENT_PRED_PARAM 04805H
40 X48_INVALID_FAULTRESPON_PARAM 04806H
80 X48_INVALID_ATTENUATOR_NUM 04807H
100 X48_INVALID_ATTENUATOR_PARAM 04808H
200 X48_DIV_BY_ZERO_DETECTOR_CNT 04809H
400 X48_INVALID_MODE 0480AH
800 X48_DST_CVR_NOT_ARMED 0480BH
1000 X48_CAL_VAL_TO_LARGE 0480CH
2000 X48_CAL_VAL_TO_SMALL 0480DH
4000 X48_INVALID_ATTEN_EVENT_TYPE 0480EH

5.2.10 Thermo-Electric Coolers Control (TEC_CTRL_ERR)

There are no error messages defined for this section.

5.2.11 Detector Channel Control (DET_CTRL_ERR)

There are no error messages defined for this section.

5.2.12 Chopper Control Errors (CHOP_CTRL_ERR)

There are no error messages defined for this section.

5.2.13 Timed Command Processor (TIMED_CMND_ERR)

2 X4C_COMMAND_REQUESTED_FOR_DELETION_NOT_FOUND 04C01H
4 X4C_COMMAND_TOO_LARGE 04C02H
8 X4C_ERROR_DELETED_OLD_TIMED_COMMAND 04C03H
10 X4C_WARNING_TIMED_COMMAND_OLDER_THAN_CURRENT_TIME 04C04H
20 X4C_TIMED_COMMAND_TABLE_FULL 04C05H
40 X4C_TIMED_COMMAND_MISSING_ABSOLUTE_TIME 04C06H

5.2.14 Automation Processor (AUTOMAT_PROC_ERR)

2 X4D_PRIMARY_EVENT_COMMAND_TABLE_CHECKSUM_ERROR 04D01H
4 X4D_BACKUP_EVENT_COMMAND_TABLE_CHECKSUM_ERROR 04D02H
8 X4D_STATE_1_EVENT_TABLE_NUMBER_OUTSIDE_RANGE 04D03H
10 X4D_STATE_1_INTERNAL_ERROR_NO_TABLE_AVAILABLE 04D04H
20 X4D_UNABLE_TO_SEND_AZ_TABLE 04D05H
40 X4D_UNABLE_TO_SEND_AZ_TABLE_Q_FULL 04D06H
80 X4D_STATE_2_EVENT_TABLE_NUMBER_OUTSIDE_RANGE 04D07H
100 X4D_STATE_2_INTERNAL_ERROR_NO_TABLE_AVAILABLE 04D08H
200 X4D_UNABLE_TO_SEND_EL_TABLE 04D09H
400 X4D_UNABLE_TO_SEND_EL_TABLE_Q_FULL 04D0AH
800 X4D_STATE_3_EVENT_TABLE_NUMBER_OUTSIDE_RANGE 04D0BH
1000 X4D_STATE_3_INTERNAL_ERROR_NO_TABLE_AVAILABLE 04D0CH

2000 X4D_WARNING_EVENT_TABLE_NOT_PREVIOUSLY_SET 04D0DH
4000 X4D_EVENT_NUMBER_OUTSIDE_CURRENT_RANGE_LOW 04D0EH
8000 X4D_EVENT_NUMBER_OUTSIDE_CURRENT_RANGE_HIGH 04D0FH
10000 X4D_EVENT_TABLE_NUMBER_OUTSIDE_RANGE_LOW 04D10H
20000 X4D_EVENT_TABLE_NUMBER_OUTSIDE_RANGE_HIGH 04D11H
40000 X4D_ERROR_EVENT_TABLE_NOT_SET_UP 04D12H
80000 X4D_UNABLE_TO_READ_EVT_COMMAND_TABLE 04D13H
100000 X4D_INTERNAL_ERROR_INVALID_SEP_STATE 04D14H
200000 X4D_UNABLE_TO_READ_EVT_AZ_ENTRIES 04D15H
400000 X4D_UNABLE_TO_READ_EVT_EL_ENTRIES 04D16H
800000 X4D_WARNING_TABLE_ID_DOESNT_MATCH 04D17H
1000000 X4D_SCI_EVT_CMD_TABLE_EMPTY 04D18H
2000000 X4D_UNABLE_TO_SEND_EVENT_COMMAND 04D19H
4000000 X4D_UNABLE_TO_SEND_EVENT_COMMAND_Q_FULL 04D1AH
8000000 X4D_EVENT_TIME_IS_PAST_EVENT_SKIPPED 04D1BH

5.2.15 C&DH Data Acquisition Handler (CDH_DATA_ACQ_ERR)

1 X4E_SYSTEM_DATA_HANDLER_GENERAL_ERROR 04E00H
2 X4E_CANNOT_POST_FREE_FORM_MESSAGE 04E01H

5.2.16 Engineering Data Handler (ENG_DATA_ERR)

There are no error messages defined for this section.

5.2.17 Science Data Handler (SCI_DATA_ERR)

1 X50_SCIENCE_DATA_HANDLER_GENERAL_ERROR 05000H
2 X50_BUFFER_NOT_AVAIL_FOR_DETECTOR_DATA 05001H
4 X50_BUFFER_NOT_AVAIL_FOR_TRACKING_AND_PTG_DATA 05002H
8 X50_1553_SCIENCE_BUFFER_NOT_SERVICED 05003H

5.2.18 Sun Sensor Board Comm Handler (SSB_COMM_ERR)

1 X51_SS_COMM_HANDLER_GENERAL_ERROR 05100H
2 X51_DETECTED_UART_RESET 05101H
4 X51_COULD_NOT_POST_HP_COMMAND_WARN 05102H
8 X51_COULD_NOT_POST_HP_COMMAND_ERROR 05103H
10 X51_COULD_NOT_POST_COMMAND_WARN 05104H
20 X51_COULD_NOT_POST_COMMAND_ERROR 05105H
40 X51_UNKNOWN_TRANSMIT_ERROR 05106H
80 X51_UNKNOWN_RECEIVE_ERROR 05107H
100 X51_ILL_FORMED_COMMAND 05108H
200 X51_ILL_FORMED_COMMAND_NO_START 05109H
400 X51_ILL_FORMED_COMMAND_NO_END_SYNC 0510AH
800 X51_INVALID_SUBPACKET_ORDER 0510BH
1000 X51_UNEXPECTED_SUBPACKET_OPCODE 0510CH
2000 X51_BAD_CHECKSUM 0510DH

4000 X51_INIT_ERROR 0510EH
8000 X51_UART_PARITY_ERROR 0510FH
10000 X51_UART_FRAMING_ERROR 05110H
20000 X51_NO_MSGS_FROM_SSB_RECV_CHANNEL_SWITCHED 05111H

5.2.19 C&DH Queue Function (CDH_QUEUE_ERR)

1 X52_QUEUE_GENERAL_ERROR 05200H
2 X52_QUEUE_OVERFLOW_ERROR 05201H
4 X52_QUEUE_MISSING_START_SYNC 05202H
8 X52_QUEUE_QGET_INVALID_LENGTH 05203H
10 X52_QUEUE_QPUT_INVALID_LENGTH 05204H
20 X52_QUEUE_QLOOK_INVALID_LENGTH 05205H

5.2.20 Sun Sensor Critical (SS_CRITICAL_ERR)

There are no error messages defined for this section.

5.2.21 Sun Sensor Init & Task Manager (SS_I_T_ERR)

1 X81_BAD_IMAGE_CHECKSUM 08100H
2 X81_SRAM_ERROR 08101H

5.2.22 C&DH Board Comm Handler (CDH_COMM_ERR)

1 X82_CNDH_COMM_HANDLER_GENERAL_ERROR 08200H
2 X82_COULD_NOT_POST_HP_REPLY 08201H
4 X82_COULD_NOT_POST_COMMAND_ERROR 08202H
8 X82_UNKNOWN_TRANSMIT_ERROR 08203H
10 X82_UNKNOWN_RECEIVE_ERROR 08204H
20 X82_ILL_FORMED_COMMAND 08205H
40 X82_ILL_FORMED_COMMAND_NO_START 08206H
80 X82_ILL_FORMED_COMMAND_NO_END_SYNC 08207H
100 X82_INVALID_SUBPACKET_ORDER 08208H
200 X82_UNEXPECTED_SUBPACKET_OPCODE 08209H
400 X82_BAD_CHECKSUM 0820AH
800 X82_INIT_ERROR 0820BH
1000 X82_INVALID_TIME_SLOT 0820CH
2000 X82_COULD_NOT_POST_TRACKING_AND_POINTING 0820DH
4000 X82_COULD_NOT_POST_DATA_MESSAGE 0820EH
8000 X82_COULD_NOT_POST_STATE_AND_EVENT 0820FH
10000 X82_COULD_NOT_POST_SSG_REPLY 08210H
20000 X82_COULD_NOT_POST_SSB_ERROR_MAP 08211H
40000 X82_UART_PARITY_ERROR 08212H
80000 X82_UART_FRAMING_ERROR 08213H
100000 X82_NO_MSGS_FROM_CDH_RECV_CHANNEL_SWITCHED 08214H

5.2.23 Sun Sensor Data Acquisition Handler (SS_DATA_ACQ_ERR)

There are no error messages defined for this section.

5.2.24 Sun Sensor Self-Test and Diagnostics (SS_ST_DIAG_ERR)

2 X84_INVALID_CMD_CODE 08401H
4 X84_INVALID_FPGA_BANK 08402H
8 X84_SSB_DATA_DUMP_REQUEST_SIZE_TRUNCATED 08403H
10 X84_SSB_DATA_DUMP_TOO_FEW_PARAMETERS 08404H
20 X84_SSB_DATA_DUMP_TOO_MANY_PARAMETERS 08405H
40 X84_SSB_CODE_DUMP_TOO_FEW_PARAMETERS 08406H
80 X84_SSB_CODE_DUMP_TOO_MANY_PARAMETERS 08407H
100 X84_SSB_CODE_DUMP_REQUEST_SIZE_TRUNCATED 08408H
200 X84_BAD_IMAGE_CHECKSUM 08409H

5.2.25 Sun Sensor Error Handling & Fault Response (SS_EH_FR_ERR)

2 X85_ERROR_CODE_OUT_OF_RANGE 08501H

5.2.26 Sun Sensor Command Executor (SS_CMNDEXEC_ERR)

2 X86_INVALID_CMD_CODE 08601H
4 X86_INVALID_SEQ 08602H
8 X86_INVALID_FPGA_BANK 08603H
10 X86_INVALID_TRACK_PARAM 08604H
20 X86_INVALID_FAULTRESPON_PARAM 08605H
40 X86_INVALID_POINT_PARAM 08606H

5.2.27 Pointing and Stabilization (POINT_STABIL_ERR)

(The master copy of Ptg & Stabilization errors is kept in: ss\utils\SSQuecwp.h)

5.2.28 Steering Mirror Handler (STEERMIRROR_ERR)

2 X88_COULD_NOT_POST_DESIRED_AZ_EL 08801H
4 X88_COULD_NOT_POST_STEERING_MIRROR_CMD 08802H
8 X88_UNKNOWN_RECEIVE_ERROR 08803H
10 X88_BAD_SUBPACKET_CHECKSUM 08804H
20 X88_UART_PARITY_ERROR 08805H
40 X88_UART_FRAMING_ERROR 08806H
80 X88_NO_MSGS_FROM_SSG_RECV_CHANNEL_SWITCHED 08807H

5.2.29 Sun Tracking Algorithm (SUNTRACK_ERR)

(The master copy of STA errors is kept in: ss\utils\SSQuecwp.h)
1 X89_SS_INIT_TABLE_CHECKSUM_ERROR 08900H
2 X89_SS_NOISE_FLOOR_THRESHOLD_ERROR 08901H

5.2.30 Sun Sensor Queue Function (SS_QUEUE_ERR)

1	X8A_QUEUE_GENERAL_ERROR	08A00H
2	X8A_QUEUE_OVERFLOW_ERROR	08A01H
4	X8A_QUEUE_MISSING_START_SYNC	08A02H
8	X8A_QUEUE_QGET_INVALID_LENGTH	08A03H
10	X8A_QUEUE_QPUT_INVALID_LENGTH	08A04H

5.3 SOFIE ERROR CODE DICTIONARY

This section contains the SOFIE system data packet free-format error codes and the descriptions of each error message.

5.3.1 C&DH Critical Errors

4000	**X40_DUST_COVER_TIMEOUT**
	Description ▪ If the Dust Cover is not fired within 10 seconds of being armed, this error is generated and the Dust cover is disarmed (reset).
	Presentation ▪ Presented as 1 in the C&DH Critical field (cdh_critical_err) field of the error map and as 4000 in free-format portion of the system data packet.

5.3.2 C&DH Init and Task Manager Errors

4100	**X41_NO_CHOPPER_ENABLED**
	Description ▪ Part of the C&DH_OSTM startup sequence is to initialize synchronous rectifier setting. ▪ The software reads a FPGA synchronous rectifier control word to determine which values to set based on which chopper (right or left side) is enabled. ▪ If neither chopper (right or left side) is selected it generates this error and sets the default (left side) rectifier values.
	Presentation ▪ Presented as 1 in the C&DH Init & Task Manager (CDH_I_T_ERR) field of the error map and as 4100 in free-format portion of the system data packet.
4101	**X41_BAD_IMAGE_CHECKSUM**
	Description ▪ Part of the C&DH_OSTM startup sequence is to test the checksum of the image currently loaded and running in instruction SRAM. ▪ This error is generated if the calculated checksum does not match the checksum stored in memory.
	Presentation ▪ Presented as 2 in the C&DH Init & Task Manager (CDH_I_T_ERR) field of the error map and as 4101 in the free-format portion of the system data packet.
4102	**X41_SRAM_ERROR**
	Description ▪ Part of the C&DH_BLTM startup sequence is to test data SRAM. If there are any data SRAM errors, it stores the errors and then the C&DH_OSTM generates this error message as part of the C&DH_OSTM startup sequence.
	Presentation ▪ Presented as 4 in the C&DH Init & Task Manager (CDH_I_T_ERR) field of the error map. ▪ Presented in the free-format portion of the system data packet as a 4102 with 2 data words: o Parameter count o Number of data SRAM errors ▪ The SRAM address locations which exibit an error are also stored in upper SRAM. (OD_address 0) beginning at location 0000.

4103	**X41_PRI_SSA_INIT_TABLE_BAD_CHECKSUM**
	Description
	▪ When attempting to transmit the initialization table for the sun sensor algorithm, if the checksum for the primary copy of the table is in error, then this error code is generated. The primary table is kept in OD address 0xE.
	Presentation
	▪ Presented as 8 in the C&DH Init & Task Manager (CDH_I_T_ERR) field of the error map. ▪ Presented in the free-format portion of the system data packet as a 4103 with 2 data words: o Parameter count o Computed checksum ▪ The command "pass sofie ssainit_tbl" might cause this error.
4104	**X41_UNABLE_TO_READ_PRI_SSA_INIT_TABLE**
	Description
	▪ The primary sun sensor algorithm (AKA sun tracking algorithm) initialization table could not be read from EEPROM.
	Presentation
	▪ Presented as 10 in the C&DH Init & Task Manager (CDH_I_T_ERR) field of the error map. ▪ Presented in the free-format portion of the system data packet as a 4104 with 2 data words: o Parameter count o Error code from read_EEPROM function (see code updater errors 4502-4509) ▪ The command "pass sofie ssainit_tbl" might cause this error.
4105	**X41_PRI_SSA_INIT_TABLE_EMPTY**
	Description
	▪ This error is generated if the primary sun sensor algorithm (AKA sun tracking algorithm) table in EEPROM is empty.
	Presentation
	▪ Presented as 20 in the C&DH Init & Task Manager (CDH_I_T_ERR) field of the error map. ▪ Presented in the free-format portion of the system data packet as a 4105 with 2 data words: o Parameter count o Errant size
4106	**X41_SEC_SSA_INIT_TABLE_BAD_CHECKSUM**
	Description
	▪ If the primary SSA initialization table cannot be used, then an attempt is made to use the secondary table. When attempting to transmit the initialization table for the sun sensor algorithm (AKA sun tracking algorithm), if the checksum for the secondary copy of the table is in error, then this error code is generated. The secondary table is kept in OD address 0xF.
	Presentation
	▪ Presented as 40 in the C&DH Init & Task Manager (CDH_I_T_ERR) field of the error map. ▪ Presented in the free-format portion of the system data packet as a 4106 with 2 data words: o Parameter count o Computed checksum
4107	**X41_UNABLE_TO_READ_SEC_SSA_INIT_TABLE**
	Description
	▪ If the primary SSA initialization table cannot be used, then an attempt is made to use the secondary table. The secondary sun sensor algorithm (AKA sun tracking algorithm) initialization table could not be read from EEPROM.
	Presentation
	▪ Presented as 80 in the C&DH Init & Task Manager (CDH_I_T_ERR) field of the error map. ▪ Presented in the free-format portion of the system data packet as a 4107 with 2 data words: o Parameter count o Error code from read_EEPROM function (see code updater errors 4502-4509)

4108	**X41_SEC_SSA_INIT_TABLE_EMPTY**
	Description ▪ If the primary SSA initialization table cannot be used, then an attempt is made to use the secondary table. ▪ This error is generated if the secondary sun sensor algorithm (AKA sun tracking algorithm) table in EEPROM is empty.
	Presentation ▪ Presented as 100 in the C&DH Init & Task Manager (CDH_I_T_ERR) field of the error map and as 4107 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4108 with 2 data words: o Parameter count o Errant size
4109	**X41_1553_COMMS_FAILED**
	Description ▪ If 1553 comms fails for more than a specified number of seconds, SOFIE performs the equivalent of a power down (i.e. flush the command queue, reset SSG, turn off TEC's, SSB to standby and C&DH to safe). The specified number of seconds is configurable (via the set cdh_sram command) and is kept at C&DH SRAM address 0xe63. The nominal value is 3 seconds. The 1553 comms check may be disabled by setting the value to 0xFFFF. See AIM-900 section 3.6.1 for more information.
	Presentation ▪ Presented as 200 in the C&DH Init & Task Manager (CDH_I_T_ERR) field of the error map and as 4109 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4109 with 2 data words: o Parameter count o Mode that the C&DH was in when the 1553 comms disruption occurred

5.3.3 1553 Command Handler Errors

4200	**X42_INVALID_LENGTH**
	Description ▪ 1553 command telemetry data should consist of four, 32-word data packets. This error is generated if there is less than four 32-word data packets received.
	Presentation ▪ Presented as 1 in the 1553 Command Handler (M1553_CMND_ER) field of the error map and as 4200 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4200 with 2 data words: o parameter count o invalid length, i.e. the number of 32-word packets that were received
4201	**X42_BAD_CHECKSUM**
	Description ▪ This error is the result of either a 1553 telemetry error or an ill-formed command packet. A checksum error indicates that the received checksum in the CCSDS header does not match the computed checksum. This error will not be generated if fault response override is in effect for the C&DH (via the set_faultovercd command).
	Presentation ▪ Presented as 2 in the 1553 Command Handler (M1553_CMND_ER) field of the error map and as 4201 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4201 with 2 data words: o Parameter count o Received checksum

4202	**X42_INVALID_SID**
	Description ▪ An invalid command stream ID was received
	Presentation ▪ Presented as 4 in the 1553 Command Handler (M1553_CMND_ER) field of the error map and as 4202 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4202 with 2 data words: o Parameter count o Errant stream ID
4401	**X44_MEM_DUMP_HANDLER_INVALID_OPCODE**
	Description ▪ This is an internal error. A non-data, code or EEPROM memory dump command was received by the memory dump handler. This is an internal error and should not be caused by any command. However, it could only be caused by a non-dump command being routed to the memory dump handler.
	Presentation ▪ Presented as 2 in the C&DH Self Test & Diagnostics (CDH_ST_DIAG_ERR) field of the error map and as 4401 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4401 with 2 data words: o Parameter count o Errant stream ID
4402	**X44_EEPROM_DUMP_TOO_FEW_PARAMETERS**
	Description ▪ The dump_EEPROM command requires three parameters. This error is issued if less than the required number of parameters was passed to the command.
	Presentation ▪ Presented as 4 in the C&DH Self Test & Diagnostics (CDH_ST_DIAG_ERR) field of the error map and as 4402 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4402 with 2 data words: o Parameter count o Opcode of dump_EEPROM command
4403	**X44_EEPROM_DUMP_TOO_MANY_PARAMETERS**
	Description ▪ The dump_EEPROM command requires three parameters. This error is issued if more than the required number of parameters was passed to the command.
	Presentation ▪ Presented as 8 in the C&DH Self Test & Diagnostics (CDH_ST_DIAG_ERR) field of the error map and as 4403 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4403 with 2 data words: o Parameter count o Opcode of dump_EEPROM command
4404	**X44_CDH_DATA_DUMP_TOO_FEW_PARAMETERS**
	Description ▪ The dump_cdh_sram1 command requires three parameters. This error is issued if less than the required number of parameters was passed to the command.
	Presentation ▪ Presented as 10 in the C&DH Self Test & Diagnostics (CDH_ST_DIAG_ERR) field of the error map and as 4404 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4404 with 2 data words: o Parameter count o Opcode of dump_cdh_sram1 command

4405	**X44_CDH_DATA_DUMP_TOO_MANY_PARAMETERS**
	Description ▪ The dump_cdh_sram1 command requires three parameters. This error is issued if more than the required number of parameters was passed to the command.
	Presentation ▪ Presented as 20 in the C&DH Self Test & Diagnostics (CDH_ST_DIAG_ERR) field of the error map and as 4405 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4405 with 2 data words: o Parameter count o Opcode of dump_cdh_sram1 command
4406	**X44_CDH_CODE_DUMP_TOO_FEW_PARAMETERS**
	Description ▪ The dump_cdh_sram2 command requires parameters for the address and the length. This error is issued if less than the required number of parameters was passed to the command.
	Presentation ▪ Presented as 40 in the C&DH Self Test & Diagnostics (CDH_ST_DIAG_ERR) field of the error map and as 4406 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4406 with 2 data words: o Parameter count o Opcode of dump_cdh_sram2 command
4407	**X44_CDH_CODE_DUMP_TOO_MANY_PARAMETERS**
	Description ▪ The dump_cdh_sram2 command requires parameters for the address and the length. This error is issued if more than the required number of parameters was passed to the command.
	Presentation ▪ Presented as 80 in the C&DH Self Test & Diagnostics (CDH_ST_DIAG_ERR) field of the error map and as 4407 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4407 with 2 data words: o Parameter count o Opcode of dump_cdh_sram2 command
4408	**X44_EEPROM_DUMP_REQUEST_SIZE_TRUNCATED**
	Description ▪ This error is generated if a dump_EEPROM request is for a size larger than 467 words. Four hundred sixty-seven is the maximum number of data words that can possibly be returned in a memory dump packet. The actual dump size is truncated to the maximum size.
	Presentation ▪ Presented as 100 in the C&DH Self Test & Diagnostics (CDH_ST_DIAG_ERR) field of the error map and as 4408 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4408 with 2 data words: o Parameter count o Requested dump length
4409	**X44_EEPROM_DUMP_UNABLE_TO_COPY_DATA**
	Description ▪ The dump_EEPROM command received an error from the read_EEPROM function when attempting to read from EEPROM
	Presentation ▪ Presented as 200 in the C&DH Self Test & Diagnostics (CDH_ST_DIAG_ERR) field of the error map and as 4409 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4409 with 2 data words: o Parameter count o Error status code received from the read_EEPROM function call. (See codeupdater errors 4501-4509)

440A	**X44_CDH_DATA_DUMP_REQUEST_SIZE_TRUNCATED**
	Description ▪ This error is generated if a dump_cdh_sram1 request is for a size larger than 467 words. Four hundred sixty-seven is the maximum number of data words that can possibly be returned in a memory dump packet. The actual dump size is truncated to the maximum value.
	Presentation ▪ Presented as 400 in the C&DH Self Test & Diagnostics (CDH_ST_DIAG_ERR) field of the error map and as 440A in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 440A with 2 data words: o Parameter count o Requested dump length
440B	**X44_CDH_CODE_DUMP_REQUEST_SIZE_TRUNCATED**
	Description ▪ This error is generated if a dump_cdh_sram2 request is for a size larger than 467 words. Four hundred sixty-seven is the maximum number of data words that can possibly be returned in a memory dump packet. The actual dump size is trunctated to the maximum value.
	Presentation ▪ Presented as 800 in the C&DH Self Test & Diagnostics (CDH_ST_DIAG_ERR) field of the error map and as 440B in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 440B with 2 data words: o Parameter count o Requested dump length
440E	**X44_INVALID_CMD_CODE**
	Description ▪ If the C&DH Self-Test & Diagnostics is unable to match the command opcode with a valid recognized opcode then it generates this error.
	Presentation ▪ Presented as 4000 in the C&DH Self Test & Diagnostics (CDH_ST_DIAG_ERR) field of the error map and as 440E in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 440E with 2 data words: o Parameter count o Errant opcode
440F	**X44_INVALID_FPGA_BANK**
	Description ▪ This error is generated if a valid FPGA register bank was not selected.
	Presentation ▪ Presented as 8000 in the C&DH Self Test & Diagnostics (CDH_ST_DIAG_ERR) field of the error map and as 440F in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 440F with 2 data words: o Parameter count o Errant opcode ▪ The command 'get sofie cdh_reg' might cause this error.
4410	**X44_BAD_IMAGE_CHECKSUM**
	Description ▪ If there was an image checksum error the error is generated.
	Presentation ▪ Presented as 10000 in the C&DH Self Test & Diagnostics (CDH_ST_DIAG_ERR) field of the error map and as 4410 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4410 with 2 data words: o Parameter count o Errant opcode ▪ The command 'test sofie cdh_chksum" might cause this error.

4411	**X44_WRITE_LEN_GT_3**
	Description ▪ This error is generated if there was an attempt to test more than three EEPROM values at the same time. *Note: this command has been descoped.*
	Presentation ▪ Presented as 20000 in the C&DH Self Test & Diagnostics (CDH_ST_DIAG_ERR) field of the error map and as 4411 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4411 with 2 data words: o Parameter count o Opcode of the command
4412	**X44_TEST_EE_CHKSUM_ERROR_READING_EEPROM**
	Description ▪ During execution of the test EEPROM checksum command the EEPROMs are enabled. If after enabling, the EEPROM MSB ready bit, EEPROM LSB ready bit or EEPROM control bit is not set in the FPGA EEREG then this error is generated. It indicates that there is a problem with part of the EEPROM; however, the checksum test is still carried out.
	Presentation ▪ Presented as 200000 in the C&DH Self Test & Diagnostics (CDH_ST_DIAG_ERR) field of the error map and as 4412 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4412 with 2 data words: o Parameter count o Lower three bits from the FPGA EEREG. Bit 0 (LSB) - EEPROM control bit value, Bit 1 - Low EEPROM enable status, Bit 2 - High EEPROM enable status

5.3.4 Code Updater Errors

4501	**X45_CODEUPD_INCORRECT_COMMAND_SIZE**
	Description ▪ In addition to the opcode a code update is required to have parameters for the OD_address, start address, length, two word checksum, and at least one data word for updating. This error is generated if the received command is not at least this large.
	Presentation ▪ Presented as 2 in the Code Updater (CODEUPDATE_ERR) field of the error map. ▪ Presented in the free-format portion of the system data packet as a 4501 with 2 data words: o Parameter count o Opcode of the command
4502	**CODEUPD_ERR_ODMIN**
	Description ▪ The selected OD address was below the minimum value of 8.
	Presentation ▪ Presented as 4 in the Code Updater (CODEUPDATE_ERR) field of the error map and as 4502 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4502 with 2 data words: o Parameter count o Opcode of the command ▪ This value may also be returned as the additional error information word for error responses which return the read_EEPROM or write_EEPROM function status.

4503	**CODEUPD_ERR_ODMAX**
	Description ▪ The selected OD address was above the maximum value of 0xF.
	Presentation ▪ Presented as 8 in the Code Updater (CODEUPDATE_ERR) field of the error map and as 4503 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4503 with 2 data words: o Parameter count o Opcode of the command ▪ This value may also be returned as the additional error information word for error responses which return the read_EEPROM or write_EEPROM function status.
4504	**CODEUPD_ERR_LENGMIN**
	Description ▪ This error indicates that the requested length is less than zero in size.
	Presentation ▪ Presented as 10 in the Code Updater (CODEUPDATE_ERR) field of the error map and as 4504 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4504 with 2 data words: o Parameter count o Opcode of the command ▪ This value may also be returned as the additional error information word for error responses which return the read_EEPROM or write_EEPROM function status.
4505	**CODEUPD_ERR_LENGMAX**
	Description ▪ This error indicates that the requested length is larger than 64 words.
	Presentation ▪ Presented as 20 in the Code Updater (CODEUPDATE_ERR) field of the error map and as 4505 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4505 with 2 data words o Parameter count o Opcode of the command ▪ This value may also be returned as the additional error information word for error responses which return the read_EEPROM or write_EEPROM function status.
4506	**CODEUPD_ERR_CKSUM**
	Description ▪ This error indicates the checksum for the code update packet is incorrect.
	Presentation ▪ Presented as 40 in the Code Updater (CODEUPDATE_ERR) field of the error map and as 4506 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4506 with 2 data words: o Parameter count o Opcode of the command ▪ This value may also be returned as the additional error information word for error responses which return the read_EEPROM or write_EEPROM function status.
4507	**CODEUPD_ERR_OPCODE**
	Description ▪ The opcode is not for a valid update command.
	Presentation ▪ Presented as 80 in the Code Updater (CODEUPDATE_ERR) field of the error map and as 4507 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4507 with 2 data words: o Parameter count o Opcode of the command ▪ This value may also be returned as the additional error information word for error responses which return the read_EEPROM or write_EEPROM function status.

4508	**CODEUPD_ERR_IMPLIMEN**
	Description ▪ This code is no longer used.
	Presentation ▪ none
4509	**CODEUPD_ERR_PAGE**
	Description ▪ A requested EEPROM write would cross page boundaries.
	Presentation ▪ Presented as 200 in the Code Updater (CODEUPDATE_ERR) field of the error map and as 4509 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4509 with 2 data words: o Parameter count o Opcode of the command ▪ This value may also be returned as the additional error information word for error responses which return the read_EEPROM or write_EEPROM function status.
450A	**X45_E2WRITE_ERR_LSB_EEPROM_BUSY**
	Description ▪ The LSB EEPROM was busy when attempting to write to EEPROM; however, the write will still be attempted.
	Presentation ▪ Presented as 400 in the Code Updater (CODEUPDATE_ERR) field of the error map and as 450A in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 450A with 2 data words: o Parameter count o Requested EEPROM OD address
450B	**X45_E2WRITE_ERR_MSB_EEPROM_BUSY**
	Description ▪ The MSB EEPROM was busy when attempting to write to EEPROM; however, the write will still be attempted.
	Presentation ▪ Presented as 800 in the Code Updater (CODEUPDATE_ERR) field of the error map and as 450B in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 450B with 2 data words: o Parameter count o Errant opcode.the requested EEPROM OD address
450C	**X45_E2WRITE_ERR_CTRL_EEPROM_DISABLED**
	Description ▪ The EEPROM control bit was not set when attempting to write to EEPROM.; however, the write will still be attempted.
	Presentation ▪ Presented as 1000 in the Code Updater (CODEUPDATE_ERR) field of the error map and as 450C in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 450C with 2 data words: o Parameter count o Requested EEPROM OD address

450D	**X45_E2READ_ERR_LSB_EEPROM_BUSY**
	Description ▪ The LSB EEPROM was busy when attempting to read from EEPROM; however, the read will still be attempted.
	Presentation ▪ Presented as 2000 in the Code Updater (CODEUPDATE_ERR) field of the error map and as 450D in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 450D with 2 data words: o Parameter count o Requested EEPROM OD address
450E	**X45_E2READ_ERR_MSB_EEPROM_BUSY**
	Description ▪ The MSB EEPROM was busy when attempting to read from EEPROM; however, the read will still be attempted.
	Presentation ▪ Presented as 4000 in the Code Updater (CODEUPDATE_ERR) field of the error map and as 450E in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 450E with 2 data words: o Parameter count o Requested EEPROM OD address
450F	**X45_E2READ_ERR_CTRL_EEPROM_DISABLED**
	Description ▪ The EEPROM control bit was not set when attempting to read from EEPROM. However, the read is still attempted.
	Presentation ▪ Presented as 8000 in the Code Updater (CODEUPDATE_ERR) field of the error map and as 450F in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 450F with 2 data words: o Parameter count o Requested EEPROM OD address

5.3.5 C&DH Error Handler and Fault Response Errors

4601	**X46_INVALID_ERROR_CODE**
	Description ▪ This code is not currently used.
	Presentation ▪ none
4602	**X46_ERROR_CODE_OUT_OF_RANGE**
	Description ▪ The error map uses two words (32 bits) for each subsystem. As a result, the largest error code for a subsystem is 0x1F (31 decimal). ▪ This error is generated if an error code for a subsystem is larger than 0x1F.
	Presentation ▪ Presented as 4 in the C&DH Error Handler & Fault Response (CDH_EH_FR_ERR) field of the error map and as 4602 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4602 with 2 data words: o Parameter count o Errant error code

5.3.6 1553 Data Handler Errors

4700	**X47_ENGDAT_SC_NOT_READY**
	Description ▪ This error is generated if the previous engineering data message has not been sent when a new engineering data message is ready for transmission. ▪ It is possible to generate this error by requesting a system message in close proximity to an automatically generated engineering message.
	Presentation ▪ Presented as 1 in the 1553 Data Handler (M1553_DATA_ERR) field of the error map and as 4700 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4700 with 2 data words: o Parameter count o CRIT_TEL_BUF_CNT (Number of 32 word 1553 blocks not yet transferred)
4701	**X47_1553_ENG_BUFFER_NOT_SERVICED**
	Description ▪ This error is generated if at least two consecutive engineering data messages could not be sent due to the spacecraft not servicing 1553 Comms. This may indicate that the spacecraft has missed 1553 interrupts or another 1553 error has occurred.
	Presentation ▪ Presented as 2 in the 1553 Data Handler (M1553_DATA_ERR) field of the error map and as 4701 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4701 with 2 data words: o Parameter count o Updated CRIT_TEL_POL value ▪ When this error is generated, the CRIT_TEL_POL count is incremented to notify the spacecraft that engineering data are available. ▪ The additional error information contains the updated CRIT_TEL_POL value.

5.3.7 C&DH Command Executor Errors

4801	**X48_INVALID_CMD_CODE**
	Description ▪ This error is generated if the C&DH Command Executor is unable to match the command opcode with a valid recognized opcode.
	Presentation ▪ Presented as 2 in the C&DH Command Executor (CDH_CMNDEXEC_ERR) field of the error map and as 4801 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4801 with 2 data words: o Parameter count o Opcode of the errant command
4802	**X48_INVALID_SEQ**
	Description ▪ This command is generated if a command to reset the C&DH 30-second timer is sent to the C&DH Command Executor while the C&DH is not in the polling sequence.
	Presentation ▪ Presented as 4 in the C&DH Command Executor (CDH_CMNDEXEC_ERR) field of the error map and as 4802 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4802 with 2 data words. o Parameter count o Opcode of the errant command.

4803	**X48_INVALID_FPGA_BANK**
	Description ▪ This error is generated if a valid FPGA register bank was not selected.
	Presentation ▪ Presented as 8 in the C&DH Command Executor (CDH_CMNDEXEC_ERR) field of the error map and as 4803 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4803 with 2 data words: o Parameter count o Opcode of the errant command
4804	**X48_INVALID_SET_1553_CHKSMV_PARAM**
	Description ▪ This error is generated if a valid command parameter was not selected.
	Presentation ▪ Presented as 10 in the C&DH Command Executor (CDH_CMNDEXEC_ERR) field of the error map and as 4804 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4804 with 2 data words: o Parameter count o Opcode of the errant command
4805	**X48_INVALID_SET_EVENT_PRED_PARAM**
	Description ▪ This error is generated if a valid command parameter was not selected.
	Presentation ▪ Presented as 20 in the C&DH Command Executor (CDH_CMNDEXEC_ERR) field of the error map and as 4805 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4805 with 2 data words: o Parameter count o Opcode of the errant command
4806	**X48_INVALID_FAULTRESPON_PARAM**
	Description ▪ This error is generated if a valid command parameter was not selected.
	Presentation ▪ Presented as 40 in the C&DH Command Executor (CDH_CMNDEXEC_ERR) field of the error map and as 4806 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4806 with 2 data words: o Parameter count o Opcode of the errant command
4807	**X48_INVALID_ATTENUATOR_NUM**
	Description ▪ This error is generated if a valid attenuator number was not selected.
	Presentation ▪ Presented as 80 in the C&DH Command Executor (CDH_CMNDEXEC_ERR) field of the error map and as 4807 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4807 with 2 data words: o Parameter count o Opcode of the errant command
4808	**X48_INVALID_ATTENUATOR_PARAM**
	Description ▪ This error is generated if a valid attenuator parameter was not selected.
	Presentation ▪ Presented as 100 in the C&DH Command Executor (CDH_CMNDEXEC_ERR) field of the error map and as 4808 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4808 with 2 data words: o Parameter count o Opcode of the errant command

4809	**X48_DIV_BY_ZERO_DETECTOR_CNT**
	Description ▪ This error is generated if current detector counts = 0.
	Presentation ▪ Presented as 200 in the C&DH Command Executor (CDH_CMNDEXEC_ERR) field of the error map and as 4809 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4809 with 2 data words: o Parameter count o Opcode of the errant command
480A	**X48_INVALID_MODE**
	Description ▪ This error is generated if a Dust Cover command is sent while the C&DH is not in Safe Mode. ▪ This error is sent if the command to place the C&DH in Science Mode is sent while the C&DH is in Safe Mode.
	Presentation ▪ Presented as 400 in the C&DH Command Executor (CDH_CMNDEXEC_ERR) field of the error map and as 480A in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 480A with 2 data words: o Parameter count o Opcode of the errant command
480B	**X48_DST_CVR_NOT_ARMED**
	Description ▪ This error is generated if a release Dust Cover command is sent but the Dust Cover is not armed.
	Presentation ▪ Presented as 800 in the C&DH Command Executor (CDH_CMNDEXEC_ERR) field of the error map and as 480B in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 480B with 2 data words: o Parameter count o Opcode of the errant command
480C	**X48_CAL_VAL_TO_LARGE**
	Description ▪ If the calculated target attenuator setting is greater than FFF, then the attenuator value is set to FFF and this error is generated.
	Presentation ▪ Presented as 1000 in the C&DH Command Executor (CDH_CMNDEXEC_ERR) field of the error map and as 480C in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 480C with 2 data words: o Parameter count o Opcode of the errant command
480D	**X48_CAL_VAL_TO_SMALL**
	Description ▪ If the calculated target attenuator setting is less than 1, then the attenuator value is set to 1 and this error is generated.
	Presentation ▪ Presented as 2000 in the C&DH Command Executor (CDH_CMNDEXEC_ERR) field of the error map and as 480D in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 480D with 2 data words: o Parameter count o Opcode of the errant command

480E	**X48_INVALID_ATTEN_EVENT_TYPE**
	Description ▪ This error is generated if the attenuator table type is not sunset (type 0) or sunrise (type 1).
	Presentation ▪ Presented as 4000 in the C&DH Command Executor (CDH_CMNDEXEC_ERR) field of the error map and as 480E in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 480E with 2 data words: o Parameter count o Opcode of the errant command

5.3.8 Timed Command Processor Errors

4C01	**X4C_COMMAND_REQUESTED_FOR_DELETION_NOT_FOUND**
	Description ▪ A command matching the requested time and opcode that was requested for deletion from the timed command table could not be found.
	Presentation ▪ Presented as 2 in the Timed Command Processor (TIMED_CMND_ERR) field of the error map and as 4C01 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4C01 with 2 data words: o Parameter count o Opcode or command requested for deletion
4C02	**X4C_COMMAND_TOO_LARGE**
	Description ▪ The maximum size for a command in the timed command table is eleven parameters and two words for the absolute time. Any command larger than this will generate this error and cannot be used as a timed command.
	Presentation ▪ Presented as 4 in the Timed Command Processor (TIMED_CMND_ERR) field of the error map and as 4C02 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4C02 with 2 data words: o Parameter count o Opcode of the errant command
4C03	**X4C_ERROR_DELETED_OLD_TIMED_COMMAND**
	Description ▪ A command found in the timed command table had a requested execution time more than one second in the past. As a result, the command is deleted, without executing. This may be caused if an invalid absolute time was used for the command when it was inserted, or the C&DH was in Safe Mode when the command was to be executed.
	Presentation ▪ Presented as 8 in the Timed Command Processor (TIMED_CMND_ERR) field of the error map and as 4C03 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4C03 with 2 data words: o Parameter count o Opcode of the errant command
4C04	**X4C_WARNING_TIMED_COMMAND_OLDER_THAN_CURRENT_TIME**
	Description ▪ A command found in the timed command table had a requested execution time in the past, but not more than one second in the past. ▪ The command is executed but this warning is generated.
	Presentation ▪ Presented as 10 in the Timed Command Processor (TIMED_CMND_ERR) field of the error map and as 4C04 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4C04 with 2 data words: o Parameter count o Opcode of the command

4C05	**X4C_TIMED_COMMAND_TABLE_FULL**
	Description ▪ The timed command table is sized to contain up to 128 timed commands. This error is generated if the entire table is full (128 commands). ▪ The check for a full table is made before extracting a command from the timed command queue so that timed commands are not lost when extracted from the timed command queue. However, in doing so, it may mean that a command becomes "old" before it is inserted in the table. In this case, ground operations would see that the table was full before they see that old commands were not executed. This should aid in diagnosis of the problem.
	Presentation ▪ Presented as 20 in the Timed Command Processor (TIMED_CMND_ERR) field of the error map and as 4C05 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4C05 with 2 data words: o Parameter count o Number of entries in the buffer
4C06	**X4C_TIMED_COMMAND_MISSING_ABSOLUTE_TIME**
	Description ▪ A timed command can only be used if the absolute execution time parameter is received. This error is generated if the absolute execution time parameter is not included with a timed command.
	Presentation ▪ Presented as 40 in the Timed Command Processor (TIMED_CMND_ERR) field of the error map and as 4C06 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4C06 with 2 data words: o Parameter count o Opcode of the errant command

5.3.9 Science Event Processor (Automation Processor) Errors

4D01	**X4D_PRIMARY_EVENT_COMMAND_TABLE_CHECKSUM_ERROR**
	Description ▪ The primary event command table (contained in EEPROM at OD address 0xE) specified for an event has a checksum error. The table cannot be used, but an attempt is then made to use the backup table.
	Presentation ▪ Presented as 2 in the Automation Processor (AUTOMAT_PROC_ERR) field of the error map and as 4D01 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4D01 with 2 data words: o Parameter count o Computed checksum
4D02	**X4D_BACKUP_EVENT_COMMAND_TABLE_CHECKSUM_ERROR**
	Description ▪ The backup event command table (contained in EEPROM at OD address 0xF) specified for an event has a checksum error. The table cannot be used. ▪ This error is only generated after the primary table has first been checked. Therefore, there is no event command table available for the event and the event cannot be executed.
	Presentation ▪ Presented as 2 in the Automation Processor (AUTOMAT_PROC_ERR) field of the error map and as 4D02 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4D02 with 2 data words: o Parameter count o Computed checksum

4D03	**X4D_STATE_1_EVENT_TABLE_NUMBER_OUTSIDE_RANGE**
	Description ▪ The table number is verified when the science event command (set_sunris_event or set_sunset_event) is received, so this error should never occur. ▪ However, should the table number become corrupted in some way during azimuth table processing, this error would indicate that the table number for the event was outside of the range 1 to 63.
	Presentation ▪ Presented as 8 in the Automation Processor (AUTOMAT_PROC_ERR) field of the error map and as 4D03 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4D03 with 2 data words: o Parameter count o Errant table number
4D04	**X4D_STATE_1_INTERNAL_ERROR_NO_TABLE_AVAILABLE**
	Description ▪ The availability of a table is verified during checksum processing so this error should never occur. ▪ However, should the table status (primary or backup) become corrupted in some way during azimuth table processing, this error would indicate that neither the primary nor backup table has been selected.
	Presentation ▪ Presented as 10 in the Automation Processor (AUTOMAT_PROC_ERR) field of the error map and as 4D04 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4D04 with 2 data words: o Parameter count o Errant table number
4D05	**X4D_UNABLE_TO_SEND_AZ_TABLE**
	Description ▪ An error occurred when posting the azimuth table to the CNDH_SUN_SENSOR_COMMAND_QUEUE that was other than a queue overflow. As a result, processing of the event is terminated and the event is deleted. ▪ Check the C&DH Queue Function section of the Error Map to determine what queue error occurred.
	Presentation ▪ Presented as 20 in the Automation Processor (AUTOMAT_PROC_ERR) field of the error map and as 4D05 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4D05 with 2 data words: o Parameter count o Errant table number
4D06	**X4D_UNABLE_TO_SEND_AZ_TABLE_Q_FULL**
	Description ▪ Three attempts were made to post the azimuth table to the CNDH_SUN_SENSOR_COMMAND_QUEUE; however, the queue was full during each attempt. As a result, processing of the event is terminated and the event is deleted.
	Presentation ▪ Presented as 40 in the Automation Processor (AUTOMAT_PROC_ERR) field of the error map and as 4D06 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4D06 with 2 data words: o Parameter count o Errant table number

4D07	**X4D_STATE_2_EVENT_TABLE_NUMBER_OUTSIDE_RANGE**
	Description ▪ The table number is verified when the science event command (set_sunris_event or set_sunset_event) is received, so this error should never occur. ▪ However, should the table number become corrupted in some way during elevation table processing, this error would indicate that the table number for the event was outside of the range 1 to 63.
	Presentation ▪ Presented as 80 in the Automation Processor (AUTOMAT_PROC_ERR) field of the error map and as 4D07 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4D07 with 2 data words: o Parameter count o Errant table number
4D08	**X4D_STATE_2_INTERNAL_ERROR_NO_TABLE_AVAILABLE**
	Description ▪ The availability of a table is verified during checksum processing so this error should never occur. ▪ However, should the table status (primary or backup) become corrupted in some way during elevation table processing, this error would indicate that neither the primary nor backup table have been selected.
	Presentation ▪ Presented as 100 in the Automation Processor (AUTOMAT_PROC_ERR) field of the error map and as 4D08 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4D08 with 2 data words: o Parameter count o Errant table number
4D09	**X4D_UNABLE_TO_SEND_EL_TABLE**
	Description ▪ An error occurred when posting the elevation table to the CNDH_SUN_SENSOR_COMMAND_QUEUE that was other than a queue overflow. As a result, processing of the event is terminated and the event is deleted. ▪ Check the C&DH Queue Function section of the Error Map to determine what queue error occurred.
	Presentation ▪ Presented as 200 in the Automation Processor (AUTOMAT_PROC_ERR) field of the error map and as 4D09 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4D09 with 2 data words: o Parameter count o Errant table number
4D0A	**X4D_UNABLE_TO_SEND_EL_TABLE_Q_FULL**
	Description ▪ Three attempts were made to post the elevation table to the CNDH_SUN_SENSOR_COMMAND_QUEUE; however, the queue was full during each attempt. As a result, processing of the event is terminated and the event is deleted.
	Presentation ▪ Presented as 400 in the Automation Processor (AUTOMAT_PROC_ERR) field of the error map and as 4D0A in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4D0A with 2 data words: o Parameter count o Errant table number

4D0B	**X4D_STATE_3_EVENT_TABLE_NUMBER_OUTSIDE_RANGE**
	Description ▪ The table number is verified when the science event command (set_sunris_event or set_sunset_event) is received, so this error should never occur. ▪ However, should the table number become corrupted in some way during event time range determination, this error would indicate that the table number for the event was outside of the range 1 to 63.
	Presentation ▪ Presented as 800 in the Automation Processor (AUTOMAT_PROC_ERR) field of the error map and as 4D0B in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4D0B with 2 data words: o Parameter count o Errant table number
4D0C	**X4D_STATE_3_INTERNAL_ERROR_NO_TABLE_AVAILABLE**
	Description ▪ The availability of a table is verified during checksum processing, so this error should never occur. ▪ However, should the table status (primary or backup) become corrupted in some way during event time range determination, this error indicates that neither the primary nor backup table has been selected.
	Presentation ▪ Presented as 1000 in the Automation Processor (AUTOMAT_PROC_ERR) field of the error map and as 4D0C in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4D0C with 2 data words: o Parameter count o Errant table number
4D0D	**X4D_WARNING_EVENT_TABLE_NOT_PREVIOUSLY_SET**
	Description ▪ This warning is generated if the set_sci_evt_tbl command had not been used to set up the table of science events previous to the execution of a set_sunris_event or set_sunset_event command. ▪ The first event in the table of science events is set to the event number from the set_sunris_event or set_sunset_event command. The table is set up anyway.
	Presentation ▪ Presented as 2000 in the Automation Processor (AUTOMAT_PROC_ERR) field of the error map and as 4D0D in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4D0D with 2 data words: o Parameter count o First event number in table of science events
4D0E	**X4D_EVENT_NUMBER_OUTSIDE_CURRENT_RANGE_LOW**
	Description ▪ There are 256 events that can be maintained at any time in the table of science events. ▪ This error is generated if the requested event number is less than the first event in the table. ▪ The range of valid events may be determined through the use of the get_next_event command.
	Presentation ▪ Presented as 4000 in the Automation Processor (AUTOMAT_PROC_ERR) field of the error map and as 4D0E in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4D0E with 2 data words: o Parameter count o Requested event number

4D0F	**X4D_EVENT_NUMBER_OUTSIDE_CURRENT_RANGE_HIGH**
	Description ▪ There are 256 events that can be maintained at any time in the table of science events. ▪ This error is generated if the requested event number is greater than the last event in the table. ▪ The range of valid events may be determined through the use of the get_next_event command. ▪ The range is always the first event number plus 255.
	Presentation ▪ Presented as 8000 in the Automation Processor (AUTOMAT_PROC_ERR) field of the error map and as 4D0F in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4D0F with 2 data words: o Parameter count o Requested event number
4D10	**X4D_EVENT_TABLE_NUMBER_OUTSIDE_RANGE_LOW**
	Description ▪ Valid event command table numbers are in the range 1 to 63. ▪ This error is generated if the table number in the set_sunris_event or set_sunset_event command is less than 1.
	Presentation ▪ Presented as 10000 in the Automation Processor (AUTOMAT_PROC_ERR) field of the error map and as 4D10 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4D10 with 2 data words: o Parameter count o Requested table number
4D11	**X4D_EVENT_TABLE_NUMBER_OUTSIDE_RANGE_HIGH**
	Description ▪ Valid event command table numbers are in the range 1 to 63. ▪ This error is generated if the table number in the set_sunris_event or set_sunset_event command is greater than 63.
	Presentation ▪ Presented as 20000 in the Automation Processor (AUTOMAT_PROC_ERR) field of the error map and as 4D11 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4D11 with 2 data words: o Parameter count o Requested table number
4D12	**X4D_ERROR_EVENT_TABLE_NOT_SET_UP**
	Description ▪ The get_event_info command returns information (absolute start time and event command table number) for a specific event number. ▪ This error is generated if the table of events has not been setup prior to execution of the get_event_info command.
	Presentation ▪ Presented as 40000 in the Automation Processor (AUTOMAT_PROC_ERR) field of the error map and as 4D12 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4D12 with 2 data words: o Parameter count o Requested event number

4D13	**X4D_UNABLE_TO_READ_EVT_COMMAND_TABLE**
	Description ▪ An error was detected while attempting to read the event command table from EEPROM using the read_EEPROM function.
	Presentation ▪ Presented as 80000 in the Automation Processor (AUTOMAT_PROC_ERR) field of the error map and as 4D13 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4D13 with 2 data words: o Parameter count o Status returned from the read_EEPROM function ▪ *See the code updater error codes for specific information.*
4D14	**X4D_INTERNAL_ERROR_INVALID_SEP_STATE**
	Description ▪ Several 20-Hz cycles are required to complete all the processing required to setup for an event. As a result, the science event processor was implemented as a state machine. ▪ However, this error is generated if an invalid state is detected.
	Presentation ▪ Presented as 100000 in the Automation Processor (AUTOMAT_PROC_ERR) field of the error map and as 4D14 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4D14 with 2 data words: o Parameter count o Invalid state number
4D15	**X4D_UNABLE_TO_READ_EVT_AZ_ENTRIES**
	Description ▪ An error was detected while attempting to read the azimuth entries from an event command table from EEPROM using the read_EEPROM function.
	Presentation ▪ Presented as 200000 in the Automation Processor (AUTOMAT_PROC_ERR) field of the error map and as 4D15 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4D15 with 2 data words: o Parameter count o Status returned from the read_EEPROM function ▪ *See the code updater error codes for specific information.*
4D16	**X4D_UNABLE_TO_READ_EVT_EL_ENTRIES**
	Description ▪ An error was detected while attempting to read the elevation entries from an event command table from EEPROM using the read_EEPROM function.
	Presentation ▪ Presented as 400000 in the Automation Processor (AUTOMAT_PROC_ERR) field of the error map and as 4D16 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4D16 with 2 data words: o Parameter count o Status returned from the read_EEPROM function ▪ *See the code updater error codes for specific information.*

4D17	**X4D_WARNING_TABLE_ID_DOESNT_MATCH**
	Description ▪ During science event processing, it was detected that the ID of an event command table stored in EEPROM does not match the ID for where it is stored. This does not prevent processing the event; however, the event command table should be checked to determine that it is the correct table.
	Presentation ▪ Presented as 800000 in the Automation Processor (AUTOMAT_PROC_ERR) field of the error map and as 4D17 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4D17 with 2 data words: o Parameter count o Errant table ID read from EEPROM
4D18	**X4D_SCI_EVT_CMD_TABLE_EMPTY**
	Description ▪ The event command table specified by a set_sunris_event or set_sunset_event command is zero sized and cannot be used for processing an event. If this was a primary event command table, then the secondary table will be checked; however, if this was a secondary table, then the primary table was also not usable. As a result, the event cannot be processed.
	Presentation ▪ Presented as 1000000 in the Automation Processor (AUTOMAT_PROC_ERR) field of the error map and as 4D18 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4D18 with 2 data words: o Parameter count o OD address of the empty table, i.e. 0xe for a primary table and 0xf for a backup table
4D19	**X4D_UNABLE_TO_SEND_EVENT_COMMAND**
	Description ▪ An error occurred when posting a command from an event command table to the CNDH_TIMED_COMMAND_QUEUE that was other than a queue overflow. As a result, the command cannot be executed during the event. However, unlike the copying of azimuth or elevation tables, attempts are made to continue processing the event. ▪ Check the C&DH Queue Function section of the Error Map to determine what queue error occurred.
	Presentation ▪ Presented as 2000000 in the Automation Processor (AUTOMAT_PROC_ERR) field of the error map and as 4D19 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4D19 with 2 data words: o Parameter count o Opcode of the command that could not be copied
4D1A	**X4D_UNABLE_TO_SEND_EVENT_COMMAND_Q_FULL**
	Description ▪ Three attempts were made to post a command from an event command table to the CNDH_TIMED_COMMAND_QUEUE; however, the queue was full during each attempt. As a result, the command cannot be executed during the event. Unlike the copying of azimuth or elevation table, attempts are made to continue copying any remaining commands for the event.
	Presentation ▪ Presented as 4000000 in the Automation Processor (AUTOMAT_PROC_ERR) field of the error map and as 4D1A in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4D1A with 2 data words: o Parameter count o Opcode of the command that could not be copied

4D1B	X4D_EVENT_TIME_IS_PAST EVENT_SKIPPED
	Description ▪ The specified absolute start time for an event (in the table of events) has passed. The event is not processed and will be deleted. ▪ This can occur if an incorrect start time is used when the event command is issued. It may also occur if the event time passes while SOFIE is in Safe Mode (i.e., events and timed commands are not processed during Safe Mode).
	Presentation ▪ Presented as 8000000 in the Automation Processor (AUTOMAT_PROC_ERR) field of the error map and as 4D1B in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4D1B with 2 data words: o Parameter count o Event number of the skipped event

5.3.10 C&DH Data Acquisition Handler Errors

4E00	X4E_SYSTEM_DATA_HANDLER_GENERAL_ERROR
	Description ▪ This error code is not being used.
	Presentation ▪ none
4E01	X4E_CANNOT_POST_FREE_FORM_MESSAGE
	Description ▪ If the free format section of the system data report becomes full before the report is transmitted to the spacecraft, then additional free format messages are discarded.
	Presentation ▪ Presented as 2 in the C&DH Data Acquisition Handler (CDH_DATA_ACQ_ERR) field of the error map and as 4E01 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 4E01 with 2 data words: o Parameter count o OPCODE of the lost message ▪ Science Data Handler Errors.
5000	X50_SCIENCE_DATA_HANDLER_GENERAL_ERROR
	Description ▪ This error code is not being used.
	Presentation ▪ none
5001	X50_BUFFER_NOT_AVAIL_FOR_DETECTOR_DATA
	Description ▪ There are three science data buffers defined. ▪ Detector data will be generated if the C&DH Board is in Science Mode (via the select sofie science command). ▪ However, if track data mode has been selected (via set sofie track_data command), then a buffer is not sent to the spacecraft until it contains detector data as well as tracking, pointing and sums data from the SSB. ▪ This error is generated if no tracking, pointing or sums data has been received from the SSB before all three buffers are full, or the buffers cannot be transmitted to the spacecraft for some other reason. This may be caused by failing to place the SSB in Science Mode.
	Presentation ▪ Presented as 2 in the Science Data Handler (SCI_DATA_ERR) of the error map and as 5001 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 5001 with 2 data words: o Parameter count o Buffer number that already contained unsent detector data (0 through 2)

5002	**X50_BUFFER NOT_AVAIL_FOR_TRACKING_AND_PTG_DATA**
	Description ▪ There are three science data buffers defined. ▪ Detector data will be generated if the C&DH Board is in Science Mode (via the select sofie science command). ▪ If the sun sensor is in Science Mode with track data selected, then the sun sensor will generate tracking, pointing and sums data. ▪ This error is generated if all three science data buffers contain un-transmitted tracking, pointing and sums data and there are new data that cannot be placed in a buffer. ▪ This error may be generated if the buffers cannot be transmitted to the spacecraft.
	Presentation ▪ Presented as 4 in the Science Data Handler (SCI_DATA_ERR) field of the error map and as 5002 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 5002 with 2 data words: o Parameter count o Buffer number that already contained unsent tracking, pointing and sums data (0 through 2)
5003	**X50_1553_SCIENCE_BUFFER_NOT_SERVICED**
	Description ▪ This error is generated if at least two seconds have passed and science data messages could not be sent due to the spacecraft not servicing 1553 Comms. This may indicate that the spacecraft has missed 1553 interrupts or another 1553 error has occurred.
	Presentation ▪ Presented as 8 in the Science Data Handler (SCI_DATA_ERR) field of the error map and as 5003 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 5003 with 2 data words: o Parameter count o Updated TEL_POL value ▪ When this error is generated, the TEL_POL count is incremented to reiterate to the spacecraft that science data are available. ▪ The additional error information contains the updated TEL_POL value.

5.3.11 Sun Sensor Board Comm Handler Errors

5100	**X51_SS_COMM_HANDLER_GENERAL_ERROR**
	Description ▪ This error code is not being used.
	Presentation ▪ none
5101	**X51_DETECTED_UART_RESET**
	Description ▪ This error code is not being used.
	Presentation ▪ none
5102	**X51_COULD_NOT_POST_HP_COMMAND_WARN**
	Description ▪ A high-priority command could not be sent from the C&DH RS-422 UART to the SSB because the buffer is currently full. ▪ Three attempts are made to send the command.
	Presentation ▪ Presented as 4 in the SSB Comm Handler (SSB_COMM_ERR) field of the error map and as 5102 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 5102 with 2 data words: o Parameter count o Opcode of the untransmitted high-priority command

5103	**X51_COULD_NOT_POST_HP_COMMAND_ERROR**
	Description ▪ A high-priority command could not be sent from the C&DH RS-422 UART to the SSB because the buffer is currently full. ▪ Three attempts have already been made to send the command. ▪ The command is discarded
	Presentation ▪ Presented as 8 in the SSB Comm Handler (SSB_COMM_ERR) field of the error map and as 5103 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 5103 with 2 data words: o Parameter count o Opcode of the untransmitted high-priority command
5104	**X51_COULD_NOT_POST_COMMAND_WARN**
	Description ▪ A normal priority command could not be sent from the C&DH RS-422 UART to the SSB because the buffer is currently full. ▪ Three attempts are made to send the command.
	Presentation ▪ Presented as 10 in the SSB Comm Handler (SSB_COMM_ERR) field of the error map and as 5104 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 5104 with 2 data words: o Parameter count o Error code from RS-422 Driver: -1(FFFF) = Attempted to write a message larger than 511 words, -2(FFFE) = Negative message length, -3(FFFD) = Write would overflow buffer
5105	**X51_COULD_NOT_POST_COMMAND_ERROR**
	Description ▪ A normal priority command could not be sent from the C&DH RS-422 UART to the SSB because the buffer is currently full. ▪ Three attempts have already been made to send the command. ▪ The command is discarded.
	Presentation ▪ Presented as 20 in the SSB Comm Handler (SSB_COMM_ERR) field of the error map and as 5105 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 5105 with 2 data words: o Parameter count o Error code from RS-422 Driver: -1 = Attempted to write a message larger than 511 words, -2 = Negative message length, -3 = Write would overflow buffer
5106	**X51_UNKNOWN_TRANSMIT_ERROR**
	Description ▪ An unknown status was received from the RS-422 while attempting to send a command from the C&DH Board to the sun sensor.
	Presentation ▪ Presented as 40 in the SSB Comm Handler (SSB_COMM_ERR) field of the error map and as 5106 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 5106 with 2 data words: o Parameter count o Error code from RS-422 Driver: The valid codes are -1(FFFF) = Attempted to write a message larger than 511 words, -2(FFFE)= Negative message length, -3(FFFD) = Write would overflow buffer

5107	**X51_UNKNOWN_RECEIVE_ERROR**
	Description ▪ An error occurred at the RS-422 driver level while the C&DH was receiving data from the SSB.
	Presentation ▪ Presented as 80 in the SSB Comm Handler (SSB_COMM_ERR) field of the error map and as 5107 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 5107 with 2 data words: o Parameter count o Error code from RS-422 driver ▪ The valid code is: -1 (FFFF) = Attempted to read more than 511 words.
5108	**X51_ILL_FORMED_COMMAND**
	Description ▪ This error code is no longer in use.
	Presentation ▪ none
5109	**X51_ILL_FORMED_COMMAND_NO_START**
	Description ▪ This error code is no longer in use.
	Presentation ▪ none
510A	**X51_ILL_FORMED_COMMAND_NO_END_SYNC**
	Description ▪ This error code is no longer in use.
	Presentation ▪ none
510B	**X51_INVALID SUBPACKET_ORDER**
	Description ▪ A subpacket was received by the C&DH from the SSB, which had an invalid subpacket order. Any subpackets in the hold buffer are deleted. If the just received subpacket number is 1, then the new subpacket is retained; otherwise, it too is discarded. ▪ This feature has been implimented but was never used.
	Presentation ▪ Presented as 800 in the SSB Comm Handler (SSB_COMM_ERR) field of the error map and as 510B in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 510B with 2 data words: o parameter count o opcode identifier of the subpackets from the hold buffe
510C	**X51_UNEXPECTED_SUBPACKET_OPCODE**
	Description ▪ A subpacket was received by the C&DH from the SSB, (via RS-422) which had a different opcode than what was in the hold buffer. Any subpackets in the hold buffer and this current subpacket are discarded.
	Presentation ▪ Presented as 1000 in the SSB Comm Handler (SSB_COMM_ERR) field of the error map and as 510C in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 510C with 2 data words: o Parameter count o Errant opcode from the new subpacket

510D	**X51_BAD_CHECKSUM**
	Description ▪ A subpacket received by the C&DH from the SSB had an invalid checksum. The subpacket is discarded.
	Presentation ▪ Presented as 2000 in the SSB Comm Handler (SSB_COMM_ERR) field of the error map and as 510D in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 510D with 2 data words: o Parameter count o Opcode from the errant packet ▪ *Note: Since the checksum was incorrect that it is also possible the opcode itself is incorrect.*
510E	**X51_INIT_ERROR**
	Description ▪ If the C&DH_OSTM is unable to initialize RS-422 communications with the Ssb it generates this error.
	Presentation ▪ Presented as 4000 in the SSB Comm Handler (SSB_COMM_ERR) field of the error map and as 510E in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 510E with 2 data words: o Parameter count o NULL_CODE (i.e., 0)
510F	**X51_UART_PARITY_ERROR**
	Description ▪ A parity error was detected by the Ssb Comm Handler (software located on the C&DH Board) RS-422 device driver.
	Presentation ▪ Presented as 8000 in the SSB Comm Handler (SSB_COMM_ERR) field of the error map and as 510F in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 510F with 2 data words: o Parameter count o Error code ▪ If the parity error was detected during a read operation, then the additional error word is 0x5244 (i.e. ASCII "RD"). ▪ If the parity error was detected during a write operation, then the additional error word is 0x5752 (i.e. ASCII "WR").
5110	**X51_UART_FRAMING_ERROR**
	Description ▪ A framing error was detected by the Ssb Comm Handler (software located on the C&DH Board) RS-422 device driver.
	Presentation ▪ Presented as 10000 in the SSB Comm Handler (SSB_COMM_ERR) field of the error map and as 5110 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 5110 with 2 data words: o Parameter count o Error code. If the framing error was detected during a read operation then the additional error word is 0x5244 (i.e. ASCII "RD"). If the framing error was detected during a write operation then the additional error word is 0x5752 (i.e. ASCII "WR")

5111	**X51_NO_MSGS_FROM_SSB_RECV_CHANNEL_SWITCHED**
	Description ▪ No RS-422 messages have been received by the C&DH Board (from the SSB) for over five minutes. As a result the comm channel used to receive is autonomously switched.
	Presentation ▪ Presented as 20000 in the SSB Comm Handler (SSB_COMM_ERR) field of the error map and as 5111 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 5111 with 2 data words: o Parameter count o Errant comm channel (i.e. the receive channel that was in use before the channel was switched)

5.3.12 C&DH Queue Function Errors

5200	**X52_QUEUE_GENERAL_ERROR**
	Description ▪ This error code is not being used.
	Presentation ▪ none
5201	**X52_QUEUE_OVERFLOW_ERROR**
	Description ▪ There was not enough space to fit a record into a queue. I.e. there is a queue overflow.
	Presentation ▪ Presented as 2 in the C&DH Queue Function (CDH_QUEUE_ERR) field of the error map and as 5201 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 5201 with 2 data words: o Parameter count o Queue identifier (qid) of the queue which overflowed ▪ The qid's are as follows: 0 = C&DH Command Queue, 1 = C&DH Status and Error Queue, 2 = C&DH Message Queue, 3 = C&DH Memory Dump Queue, 4 = C&DH, SSB Command Queue, 5 = C&DH Priority Command Queue, 6 = C&DH Priority Reply Queue, 7 = C&DH Test Procedure Queue, 8 = C&DH Code Segment Queue, 9 = C&DH Timed Command Queue. ▪ The qid's are also defined in includes\CDQueues.i
5202	**X52_QUEUE_MISSING_START_SYNC**
	Description ▪ A queue record was missing a start-sync (0xAAAA). As a result, the errant queue is flushed.
	Presentation ▪ Presented as 4 in the C&DH Queue Function (CDH_QUEUE_ERR) field of the error map and as 5202 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 5202 with 2 data words: o Parameter count o Queue identifier (qid) of the queue with the errant record ▪ *See the explanation under X52_QUEUE_OVERFLOW_ERROR or includes\CDQueues.i for the list of qid's.*

5203	**X52_QUEUE_QGET_INVALID_LENGTH**
	Description ▪ An internal error has occurred in a queue record. The length of the queue record is larger than the amount of data being stored in the queue. As a result, the errant queue is flushed.
	Presentation ▪ Presented as 8 in the C&DH Queue Function (CDH_QUEUE_ERR) field of the error map and as 5203 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 5203 with 2 data words: o Parameter count o Queue identifier (qid) of the queue with the errant record ▪ *See the explanation under X52_QUEUE_OVERFLOW_ERROR or includes\CDQueues.i for the list of qid's.*
5204	**X52_QUEUE_QPUT_INVALID_LENGTH**
	Description ▪ A request was made to place a record with a negative length into a queue.
	Presentation ▪ Presented as 10 in the C&DH Queue Function (CDH_QUEUE_ERR) field of the error map and as 5204 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 5204 with 2 data words: o Parameter count o Queue identifier (qid) of the queue with the errant record ▪ *See the explanation under X52_QUEUE_OVERFLOW_ERROR or includes\CDQueues.i for the list of qid's.*
5205	**X52_QUEUE_QLOOK_INVALID_LENGTH**
	Description ▪ This error code is reserved but is not being used.
	Presentation ▪ none

5.3.13 Sun Sensor Init & Task Manager Errors

8100	**X81_BAD_IMAGE_CHECKSUM**
	Description ▪ Part of the SSB_OSTM startup sequence is to test the checksum of the image currently loaded and running in instruction SRAM. This error is generated if the calculated checksum does not match the checksum stored in memory.
	Presentation ▪ Presented as 1 in the Sun Sensor Init & Task Manager (SS_I_T_ERR) field of the error map and as 8100 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 8100 with 2 data words: o Parameter count o NULL_CODE (i.e., 0)
8101	**X81_SRAM_ERROR**
	Description ▪ Part of the SSB_BLTM startup sequence is to test data SRAM. If there are any data SRAM errors it stores the errors and then the SSB_OSTM generates this error message as part of the SSB_OSTM startup sequence.
	Presentation ▪ Presented as 2 in the Sun Sensor Init & Task Manager (SS_I_T_ERR) field of the error map and as 8101 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 8101 with 2 data words: o Parameter count o Number of data SRAM errors ▪ The SRAM address locations which exhibit an error are also stored in upper SRAM. (OD_address 0) beginning at location 0000.

5.3.14 C&DH Board Comm Handler Errors

8200	**X82_CNDH_COMM_HANDLER_GENERAL_ERROR**
	Description ▪ This error code is not being used.
	Presentation ▪ none
8201	**X82_COULD_NOT_POST_HP_REPLY**
	Description ▪ A high-priority reply could not be sent from the SSB RS-422 UART to the C&DH. Typically, this would be caused by a full UART buffer.
	Presentation ▪ Presented as 2 in the C&DH Board Comm Handler (CDH_COMM_ERR) field of the error map and as 8201 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 8201 with 2 data words: o Parameter count o Opcode of the unsent reply
8202	**X82_COULD_NOT_POST_COMMAND_ERROR**
	Description ▪ This error code is no longer in use.
	Presentation ▪ none
8203	**X82_UNKNOWN_TRANSMIT_ERROR**
	Description ▪ This error code is no longer in use.
	Presentation ▪ none
8204	**X82_UNKNOWN_RECEIVE_ERROR**
	Description ▪ An error occurred while receiving data from the C&DH Board. The error was detected by the SSB RS-422 UART driver
	Presentation ▪ Presented as 10 in the C&DH Board Comm Handler (CDH_COMM_ERR) field of the error map and as 8204 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 8204 with 2 data words: o Parameter count o Error code from RS-422 Driver: -1 (FFFF) = Read request larger than 511 words
8205	**X82_ILL_FORMED_COMMAND**
	Description ▪ This error code is no longer in use.
	Presentation ▪ none
8206	**X82_ILL_FORMED_COMMAND_NO_START**
	Description ▪ This error code is no longer in use.
	Presentation ▪ none
8207	**X82_ILL_FORMED_COMMAND_NO_END_SYNC**
	Description ▪ This error code is no longer in use.
	Presentation ▪ none
8208	**X82_INVALID_SUBPACKET_ORDER**
	Description

	▪ A subpacket was received by the SSB from the C&DH Board which had an invalid subpacket order. Any subpackets in the hold buffer are deleted. If the just received subpacket number is 1, then the new subpacket is retained; otherwise, it too is discarded.
	Presentation ▪ Presented as 100 in the C&DH Board Comm Handler (CDH_COMM_ERR) field of the error map and as 8209 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 8208 with 2 data words: o Parameter count o Opcode from the command in the hold buffer
8209	**X82_UNEXPECTED_SUBPACKET_OPCODE**
	Description ▪ A subpacket was received by the SSB from the C&DH, (via RS-422) which had a different opcode than what was in the hold buffer. When this error occurs, all subpackets in the hold buffer are discarded.
	Presentation ▪ Presented as 200 in the C&DH Board Comm Handler (CDH_COMM_ERR) field of the error map and as 8209 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 8209 with 2 data words: o Parameter count o Errant, just received opcode
820A	**X82_BAD_CHECKSUM**
	Description ▪ A subpacket received by the SSB from the C&DH Board had an invalid checksum. The subpacket is discarded.
	Presentation ▪ Presented as 400 in the C&DH Board Comm Handler (CDH_COMM_ERR) field of the error map and as 820A in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 820A with 2 data words: o Parameter count o Opcode from the errant packet ▪ *Note: Since the checksum was incorrect, it is also possible the opcode is incorrect.*
820B	**X82_INIT_ERROR**
	Description ▪ This error is generated if the SSB_BLTM is unable to initialize RS-422 communications with the C&DH Board.
	Presentation ▪ Presented as 800 in the C&DH Board Comm Handler (CDH_COMM_ERR) field of the error map and as 820B in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 820B with 2 data words: o Parameter count o NULL_CODE (i.e., 0)
820C	**X82_INVALID_TIME_SLOT**
	Description ▪ The C&DH Board Comm Handler software executes on the SSB. Since the Comm Handler cannot take a large chunk of a 10 ms timeslice, the work of this Comm Handler is divided up between 5 time slots (0 through 4). ▪ This error means that an invalid time slot number was received in the call from the SSB task manager.
	Presentation ▪ Presented as 1000 in the C&DH Board Comm Handler (CDH_COMM_ERR) field of the error map and as 820C in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 820C with 2 data words: o Parameter count o Errant time slot number

820D	**X82_COULD_NOT_POST_TRACKING_AND_POINTING**
	Description ▪ A tracking and pointing message (opcode 0xEE30) could not be sent from the SSB RS-422 UART to the C&DH. Typically, this would be caused by a full UART buffer.
	Presentation ▪ Presented as 2000 in the C&DH Board Comm Handler (CDH_COMM_ERR) field of the error map and as 820D in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 820D with 2 data words: o Parameter count o Error code from RS-422 Driver: The valid codes are -1(FFFF) = Attempted to write a message larger than 511 words, -2 (FFFE)= Negative message length, -3 (FFFD)= Write would overflow buffer
820E	**X82_COULD_NOT_POST_DATA_MESSAGE**
	Description ▪ A message extracted from the SSB data queue could not be sent from the SSB RS-422 UART to the C&DH. Typically, this would be caused by a full UART buffer.
	Presentation ▪ Presented as 46384 in the C&DH Board Comm Handler (CDH_COMM_ERR) field of the error map and as 820E in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as an 820E with 2 data words: o Parameter count o Error code from RS-422 Driver: The valid codes are -1(FFFF) = Attempted to write a message larger than 511 words, -2(FFFE) = Negative message length, -3(FFFD) = Write would overflow buffer
820F	**X82_COULD_NOT_POST_STATE_AND_EVENT**
	Description ▪ An SSB state and event change message (opcode 0xEE20) could not be sent from the SSB RS-422 UART to the C&DH. Typically, this would be caused by a full UART buffer.
	Presentation ▪ Presented as 8000 in the C&DH Board Comm Handler (CDH_COMM_ERR) field of the error map and as 820F in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 820F with 2 data words: o Parameter count o Error code from RS-422 Driver: The valid codes are -1(FFFF) = Attempted to write a message larger than 511 words, -2(FFFE) = Negative message length, -3(FFFD) = Write would overflow buffer
8210	**X82_COULD_NOT_POST_SSG_REPLY**
	Description ▪ A reply message from the SSG board could not be sent from the SSB RS-422 UART to the C&DH. Typically, this would be caused by a full UART buffer.
	Presentation ▪ Presented as 10000 in the C&DH Board Comm Handler (CDH_COMM_ERR) field of the error map and as 8210 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 8210 with 2 data words: o Parameter count o Error code from RS-422 Driver: The valid codes are -1(FFFF) = Attempted to write a message larger than 511 words, -2(FFFE) = Negative message length, -3(FFFD) = Write would overflow buffer

8211	**X82_COULD_NOT_POST_SSB_ERROR_MAP**
	Description ▪ An SSB error map message (opcode 0xEE40) could not be sent from the SSB RS-422 UART to the C&DH. Typically, this would be caused by a full UART buffer.
	Presentation ▪ Presented as 20000 in the C&DH Board Comm Handler (CDH_COMM_ERR) field of the error map and as 8211 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 8211 with 2 data words: o Parameter count o Error code from RS-422 Driver: The valid codes are -1(FFFF) = Attempted to write a message larger than 511 words, -2(FFFE) = Negative message length, -3(FFFD) = Write would overflow buffer
8212	**X82_UART_PARITY_ERROR**
	Description ▪ A parity error was detected by the C&DH Board Comm Handler (software located on the Ssb) RS-422 device driver.
	Presentation ▪ Presented as 40000 in the C&DH Board Comm Handler (CDH_COMM_ERR) field of the error map and as 8212 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 8212 with 2 data words: o Parameter count o Error word ▪ If the parity error was detected during a read operation, then the additional error word is 0x5244 (i.e. ASCII "RD"). ▪ If the parity error was detected during a write operation, then the additional error word is 0x5752 (i.e. ASCII "WR").
8213	**X82_UART_FRAMING_ERROR**
	Description ▪ A framing error was detected by the C&DH Board Comm Handler (software located on the Ssb) RS-422 device driver.
	Presentation ▪ Presented as 80000 in the C&DH Board Comm Handler (CDH_COMM_ERR) field of the error map and as 8213 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 8213 with 2 data words: o Parameter count o Error word ▪ If the parity error was detected during a read operation, then the additional error word is 0x5244 (i.e. ASCII "RD"). ▪ If the parity error was detected during a write operation, then the additional error word is 0x5752 (i.e. ASCII "WR").
8214	**X82_NO_MSGS_FROM_CDH_RECV_CHANNEL_SWITCHED**
	Description ▪ No RS-422 messages have been received by the Ssb (from the C&DH) for over five minutes. As a result, the comm channel used to receive is autonomously switched.
	Presentation ▪ Presented as 100000 in the C&DH Board Comm Handler (CDH_COMM_ERR) field of the error map and as 8214 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 8214 with 2 data words: o Parameter count o Errant comm channel (i.e., the receive channel that was in use before the channel was switched)

5.3.15 Sun Sensor Self-Test and Diagnostics Errors

8401	**X84_INVALID_CMD_CODE**
	Description ▪ An invalid self-test and diagnostics opcode was received by the SSB.
	Presentation ▪ Presented as 2 in the Sun Sensor Self_ttest & diagnostics (SS_ST_DIAG_ERR) field of the error map and as 8401 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 8401 with 2 data words: o Parameter count o Invalid opcode
8402	**X84_INVALID_FPGA_BANK**
	Description ▪ If a valid FPGA register bank was not selected, then this error is generated.
	Presentation ▪ Presented as 4 in the Sun Sensor Self_ttest & diagnostics (SS_ST_DIAG_ERR) field of the error map and as 8402 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 8402 with 2 data words: o Parameter count o Opcode of the errant command
8403	**X84_SSB_DATA_DUMP_REQUEST_SIZE_TRUNCATED**
	Description ▪ This error is generated if a dump_ssb_sram1 request is for a size larger than 256 words. Two hundred fifty-six is the maximum number of data words that can possibly be returned in a memory dump packet from the SSB. The actual dump size is truncated to the maximum size.
	Presentation ▪ Presented as 8 in the Sun Sensor Self_ttest & diagnostics (SS_ST_DIAG_ERR) field of the error map and as 8403 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 8403 with 2 data words: o Parameter count o Requested data dump length
8404	**X84_SSB_DATA_DUMP_TOO_FEW PARAMETERS**
	Description ▪ The dump_ssb_sram1 command requires three parameters. This error is issued if less than the required number of parameters was passed to the command.
	Presentation ▪ Presented as 10 in the Sun Sensor Self_ttest & diagnostics (SS_ST_DIAG_ERR) field of the error map and as 8404 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 8404 with 2 data words: o Parameter count o Opcode of the errant command
8405	**X84_SSB_DATA_DUMP_TOO_MANY PARAMETERS**
	Description ▪ The dump_ssb_sram1 command requires three parameters. This error is issued if more than the required number of parameters was passed to the command.
	Presentation ▪ Presented as 20 in the Sun Sensor Self_ttest & diagnostics (SS_ST_DIAG_ERR) field of the error map and as 8405 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 8405 with 2 data words: o Parameter count o Opcode of the errant command

8406	**X84_SSB_CODE_DUMP_TOO_FEW_PARAMETERS**
	Description ▪ The dump_ssb_sram2 command requires parameters for the address and the length. This error is issued if less than the required number of parameters was passed to the command.
	Presentation ▪ Presented as 40 in the Sun Sensor Self_ttest & diagnostics (SS_ST_DIAG_ERR) field of the error map and as 8406 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 8406 with 2 data words: o Parameter count o Opcode of the errant command
8407	**X84_SSB_CODE_DUMP_TOO_MANY_PARAMETERS**
	Description ▪ The dump_ssb_sram2 command requires parameters for the address and the length. This error is issued if more than the required number of parameters was passed to the command.
	Presentation ▪ Presented as 80 in the Sun Sensor Self_ttest & diagnostics (SS_ST_DIAG_ERR) field of the error map and as 8407 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 8407 with 2 data words: o Parameter count o Opcode of the errant command
8408	**X84_SSB_CODE_DUMP_REQUEST_SIZE_TRUNCATED**
	Description ▪ This error is generated if a dump_ssb_sram2 request is for a size larger than 256 words. Two hundred fifty-six is the maximum number of code words that can possibly be returned in a memory dump packet from the SSB. The actual dump size is truncated to the maximum size.
	Presentation ▪ Presented as 100 in the Sun Sensor Self_ttest & diagnostics (SS_ST_DIAG_ERR) field of the error map and as 8408 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 8408 with 2 data words: o Parameter count o Errant error code
8409	**X84_BAD_IMAGE_CHECKSUM**
	Description ▪ This error is generated if there was an image checksum.
	Presentation ▪ Presented as 200 in the Sun Sensor Self_ttest & diagnostics (SS_ST_DIAG_ERR) field of the error map and as 8409 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 8409 with 2 data words: o Parameter count o Command opcode

5.3.16 Sun Sensor Error Handling and Fault Response Errors

8501	**X85_ERROR_CODE_OUT_OF_RANGE**
	Description ▪ The error map uses two words (32 bits) for each subsystem. As a result, the largest error code for a subsystem is 0x1F (31 decimal). ▪ This error is generated if an error code for a subsystem is larger than 0x1F.
	Presentation ▪ Presented as 2 in the Sun Sensor Error Handler & Fault Response (SS_EH_FR_ERR) field of the error map and as 8501 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 8501 with 2 data words: o Parameter count o Errant error code

5.3.17 Sun Sensor Command Executor Errors

8601	**X86_INVALID_CMD_CODE**
	Description ▪ If the SSB Command Executor is unable to match the command opcode with a valid recognized opcode, then it generates this error.
	Presentation ▪ Presented as 2 in the Sun Sensor Command Executor (SS_CMNDEXEC_ERR) field of the error map and as 8601 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 8601 with 2 data words: o Parameter count o Errant opcode
8602	**X86_INVALID_SEQ**
	Description ▪ This error code is no longer in use.
	Presentation ▪ none
8603	**X86_INVALID_FPGA_BANK**
	Description ▪ This error is generated if a valid command parameter was not selected.
	Presentation ▪ Presented as 8 in the Sun Sensor Command Executor (SS_CMNDEXEC_ERR) field of the error map and as 8603 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 8603 with 2 data words: o Parameter count o Command opcode
8604	**X86_INVALID_TRACK_PARAM**
	Description ▪ This error is generated if a valid track parameter was not selected.
	Presentation ▪ Presented as 10 in the Sun Sensor Command Executor (SS_CMNDEXEC_ERR) field of the error map and as 8604 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 8604 with 2 data words: o Parameter count o Command opcode
8605	**X86_INVALID_FAULTRESPON_PARAM**
	Description ▪ This error is generated if a valid command parameter was not selected.
	Presentation ▪ Presented as 20 in the Sun Sensor Command Executor (SS_CMNDEXEC_ERR) field of the error map and as 8605 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 8605 with 2 data words: o Parameter count o Command opcode
8606	**X86_INVALID_POINT_PARAM**
	Description ▪ This error is generated if a valid command parameter was not selected.
	Presentation ▪ Presented as 40 in the Sun Sensor Command Executor (SS_CMNDEXEC_ERR) field of the error map and as 8606 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 8606 with 2 data words: o Parameter count o Command opcode

5.3.18 Steering Mirror Handler Errors

Note: Although the steering mirror has been removed, the following errors may still occur because the steering mirror software is still present.

8801	**X88_COULD_NOT_POST_DESIRED_AZ_EL**
	Description ▪ A set absolute az el command (opcode 0xCC20) could not be sent from the SSB RS-422 UART to the SSG board. Typically, this would be caused by a full UART buffer.
	Presentation ▪ Presented as 2 in the Steering Mirror Handler (STEERMIRROR_ERR) field of the error map and as 8801 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 8801 with 2 data words: o Parameter count o Opcode of unsent command
8802	**X88_COULD_NOT_POST_STEERING_MIRROR_CMD**
	Description ▪ A command (other than opcode 0xCC20) could not be sent from the SSB RS-422 UART to the SSG board. Typically, this would be caused by a full UART buffer.
	Presentation ▪ Presented as 4 in the Steering Mirror Handler (STEERMIRROR_ERR) field of the error map and as 8802 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 8802 with 2 data words: o Parameter count o Opcode of unsent command
8803	**X88_UNKNOWN_RECEIVE_ERROR**
	Description ▪ An error occurred at the RS-422 driver level while attempting the SSB was attempting to receive data from the SSG board.
	Presentation ▪ Presented as 8 in the Steering Mirror Handler (STEERMIRROR_ERR) field of the error map and as 8803 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 8803 with 2 data words: o Parameter count o Error code from RS-422 driver. The valid code is: -1(FFFF) = Attempted to read more than 511 words
8804	**X88_BAD_SUBPACKET_CHECKSUM**
	Description ▪ A subpacket received by the SSB from the SSG board had an invalid checksum. The subpacket is discarded.
	Presentation ▪ Presented as 10 in the Steering Mirror Handler (STEERMIRROR_ERR) field of the error map and as 8804 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 8804 with 2 data words: o Parameter count o Opcode from the errant packet ▪ *Note: Since the checksum was incorrect, it is also possible the opcode is incorrect.*

8805	**X88_UART_PARITY_ERROR**
	Description ▪ A parity error was detected by the Steering Mirror Handler (software located on the Ssb) RS-422 device driver.
	Presentation ▪ Presented as 20 in the Steering Mirror Handler (STEERMIRROR_ERR) field of the error map and as 8805 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 8805 with 2 data words: o Parameter count o Error word ▪ If the parity error was detected during a read operation, then the additional error word is 0x5244 (i.e. ASCII "RD"). ▪ If the parity error was detected during a write operation, then the additional error word is 0x5752 (i.e. ASCII "WR").
8806	**X88_UART_FRAMING_ERROR**
	Description ▪ A framing error was detected by the Steering Mirror Handler (software located on the Ssb) RS-422 device driver.
	Presentation ▪ Presented as 40 in the Steering Mirror Handler (STEERMIRROR_ERR) field of the error map and as 8806 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 8806 with 2 data words: o Parameter count o Error word ▪ If the parity error was detected during a read operation, then the additional error word is 0x5244 (i.e. ASCII "RD"). ▪ If the parity error was detected during a write operation, then the additional error word is 0x5752 (i.e. ASCII "WR").
8807	**X88_NO_MSGS_FROM_SSG_RECV_CHANNEL_SWITCHED**
	Description ▪ No RS-422 messages have been received by the Ssb (from the SSG) for over five minutes. As a result, the comm channel used to receive is autonomously switched.
	Presentation ▪ Presented as 80 in the Steering Mirror Handler (STEERMIRROR_ERR) field of the error map and as 8807 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 8807 with 2 data words: o Parameter count o Errant comm channel (i.e., the receive channel that was in use before the channel was switched)

5.3.19 Sun Sensor Algorithm Errors

8900	**X89_SS_INIT_TABLE_CHECKSUM_ERROR**
	Description ▪ The SS Tracking and Pointing Algorithm Table has a value inside of it that is incorrect. The Init Table was either (1) Not transfered before the tracking algorithm was started (Science Mode and data bit set) or (2) The Init Table checksum was not computed to be the same as the checksum in the transferred table. The table will then be loaded with default algorithm values. The default table loading will not populate a checksum at this point, but the test will not execute again.
	Presentation ▪ Presented as 1 in the Sun Tracking Algorithm (SUNTRACK_ERR) field of the error map and as 8900 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 8900 with 2 data words: o Parameter count o Computed checksum

8901	**X89_SS_NOISE_FLOOR_THRESHOLD_ERROR**
	Description
	▪ The tracking algorithm has determined that the FPA has an extremely high noise floor, and may not function properly. The tracking algorithm has computed a value larger than the noise threshold (~ 100 Counts) because, either (1) The FPA is flooded with light energy in two or more of its corner pixels, or (2) The FPA and /or controller electronics have entered an unknown state.
	Presentation
	▪ Presented as 2 in the Sun Tracking Algorithm (SUNTRACK_ERR) field of the error map and as 8901 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 8901 with 2 data words: o Parameter count o Noise value in counts

5.3.20 Sun Sensor Queue Function Errors

8A00	**X8A_QUEUE_GENERAL_ERROR**
	Description
	▪ This error code is notbeing used.
	Presentation
	▪ none
8A01	**X8A_QUEUE_OVERFLOW_ERROR**
	Description
	▪ There was not enough space to fit a record into a queue. I.e. there is a queue overflow.
	Presentation
	▪ Presented as 2 in the Sun Sensor Queue Function (SS_QUEUE_ERR) field of the error map and as 8A01 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 8A01 with 2 data words: o Parameter count o Queue identifier (qid) of the queue which overflowed ▪ The qid's are as follows: 0 = Sun Sensor Data Queue, 1 = Sun Sensor Command Queue, 2 = Sun Sensor Priority Command Queue, 3 = Sun Sensor Status and Error Queue, 4 = Sun Sensor Test Procedure Queue, 5 = Sun Sensor Priority Reply Queue, 6 = Steering Mirror Command Queue, 7 = Steering Mirror Reply Queue. ▪ The qid's are also defined in ss\includes\SSQueues.i
8A02	**X8A_QUEUE_MISSING_START_SYNC**
	Description
	▪ A queue record was missing a start sync (0xAAAA). As a result, the errant queue is flushed.
	Presentation
	▪ Presented as 4 in the Sun Sensor Queue Function (SS_QUEUE_ERR) field of the error map and as 8A02 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 8A02 with 2 data words: o Parameter count o Queue identifier (qid) of the queue which overflowed ▪ The qid's are as follows: 0 = Sun Sensor Data Queue, 1 = Sun Sensor Command Queue, 2 = Sun Sensor Priority Command Queue, 3 = Sun Sensor Status and Error Queue, 4 = Sun Sensor Test Procedure Queue,

	5 = Sun Sensor Priority Reply Queue, 6 = Steering Mirror Command Queue, 7 = Steering Mirror Reply Queue. ▪ The qid's are also defined in ss\includes\SSQueues.i
8A03	**X8A_QUEUE_QGET_INVALID_LENGTH**
	Description ▪ An internal error has occurred in a queue record. The length of the queue record is larger than the amount of data stored in the queue. As a result, the errant queue is flushed.
	Presentation ▪ Presented as 8 in the Sun Sensor Queue Function (SS_QUEUE_ERR) field of the error map and as 8A03 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 8A03 with 2 data words: o Parameter count o Queue identifier (qid) of the queue with the errant record ▪ *See the explanation under X8A_QUEUE_OVERFLOW_ERROR or ss\includes\SSQueues.i for the list of qid's.*
8A04	**X8A_QUEUE_QPUT_INVALID_LENGTH**
	Description ▪ A request was made to place a record with a negative length into a queue.
	Presentation ▪ Presented as 10 in the Sun Sensor Queue Function (SS_QUEUE_ERR) field of the error map and as 8A04 in the free-format portion of the system data packet. ▪ Presented in the free-format portion of the system data packet as a 8A04 with 2 data words: o Parameter count o Queue identifier (qid) of the queue with the errant record. ▪ *See the explanation under X8A_QUEUE_OVERFLOW_ERROR or ss\includes\SSQueues.i for the list of qids*

6 PROM MODE LIMITATIONS

Normal operations assume that current flight code has been loaded into SRAM from EEPROM. If something was to happen to the EEPROM and it fails to function properly, the instrument will revert to PROM mode and boot-up with the code resident in the boot PROMs. The instrument will operate with the following limitations:

1. The packet sequence counter in the CCSDS headers does not function.
2. The pointing control algorithm does not use the proper elevation edge of the sun.
3. The test_EE_checksum command will not function properly to return a correct checksum of EEPROM code.
4. The Sun tracking algorithm is not able to send down both the sun viewing sums and the pixel diagnostic data.
5. The asynchronous read problem when the CPU reads erroneous data from the FPGA still exists in the PROM code. This might be a problem in about one out of fifteen reads of the FPGA.
6. Synchronous rectifier values must be set with a commanded upload.
7. If 1553 communications should be lost for some reason, the instrument does not autonomously transition to Safe Mode after 3 seconds.

All of these limitations are addressed in current versions of the flight code resident in the EEPROM. With an understanding of these limitations, science observations can be made while the instrument is in prom mode should the need arise due to some unforeseen difficulty with the normal EEPROM code load.

APPENDIX A EXAMPLES OF SUNRISE AND SUNSET EVENT TABLES

A.1 Nominal Sunrise Science Event Table 1

$Id: NominalSRScienceEventTable1,v 1.1 2006/11/03 15:29:00 greg Exp $
Nominal SR occultation Cal table 1
Comment lines begin with a # in column 1
Comments may also follow entries

Each command has space for four parameters. If the command has fewer than four parameters, then space-holders are required; i.e. a command entry is required to have time, opcode, number of parameters and entries for four parameters (whether there are any parameters or not).

This table sets up the instrument for a Nominal Sunrise Event. All az and el scanning will be performed by the spacecraft.

Normally, the first command should be pass sun sensor tracking algorithm initialization table with an offset of zero seconds after event start.

History:

Date	Initials	Changes
# 2006/11/03	GJP	Re-released with attenuator balance functions reapplied.
# 2006/09/08	GJP	Removed the track acquire bit commands
# 2006/08/14	GJP	Initial Release (Modified from NominalSRScienceEventTable7 to reflect the changes necessary from a scanning mirror to arigid mirror.

0x1	# table id
0x45	# table size
0xBEEF	# checksum - placeholder only (The tool will fill this in)
0x9	# number of commands
0x0	# az table size
0x0	# el table size
0x0	# Time of command: 0 seconds
0xBB62	# Cmd 1 pass sun sensor tracking algorithm initialization table
0x0	# no parms
0x0	# Parameter placeholder
0x0	# Parameter placeholder
0x0	# Parameter placeholder
0x0	# Parameter placeholder
0x0	# Time of command: 0 seconds
0xBB29	# Cmd 2 set engineering data rate
0x1	# 1 parameters
0x1	# Specifies that an engineering data rate of 1/1
0x0	# Parameter placeholder
0x0	# Parameter placeholder
0x0	# Parameter placeholder
0x3	# Time of command: 3 seconds
0xBB49	# Cmd 3 select sofie science
0x0	# no parms
0x0	# Parameter placeholder
0x0	# Parameter placeholder
0x0	# Parameter placeholder

0x0	# Parameter placeholder
0x6	# Time: 6 seconds
0xDD47	# Cmd 4 select sofie science_s
0x0	# no parms
0x0	
0x0	
0x0	
0x0	
0x6	# Time: 6 seconds
0xBB8A	# Cmd 5 Load balance values from SRAM
0x1	# 1 parameters
0x0	# Specifies that this is a sunrise event
0x0	
0x0	
0x0	
0x8	# Time: 8 seconds
0xDD8D	# Cmd 6 set track data
0x1	# one parameter
0x1	# begin taking data
0x0	
0x0	
0x0	
0x59	# Time: 89 seconds
0xBB86	# Cmd 7 balance detector
0x4	# 4 parameters
0x1	# Detector 1
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x0	# Specifies that this is a sunrise event
0x59	# Time: 89 seconds
0xBB86	# Cmd 8 balance detector
0x4	# 4 parameters
0x2	# Detector 2
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x0	# Specifies that this is a sunrise event
0x59	# Time: 89 seconds
0xBB86	# Cmd 9 balance detector
0x4	# 4 parameters
0x3	# Detector 3
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x0	# Specifies that this is a sunrise event
0x59	# Time: 89 seconds
0xBB86	# Cmd 10 balance detector
0x4	# 4 parameters
0x4	# Detector 4
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x0	# Specifies that this is a sunrise event
0x59	# Time: 89 seconds
0xBB86	# Cmd 11 balance detector
0x4	# 4 parameters

0x5	# Detector 5
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x0	# Specifies that this is a sunrise event
0x59	# Time: 89 seconds
0xBB86	# Cmd 12 balance detector
0x4	# 4 parameters
0x6	# Detector 6
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x0	# Specifies that this is a sunrise event
0x59	# Time: 89 seconds
0xBB86	# Cmd 13 balance detector
0x4	# 4 parameters
0x7	# Detector 7
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x0	# Specifies that this is a sunrise event
0x59	# Time: 89 seconds
0xBB86	# Cmd 14 balance detector
0x4	# 4 parameters
0x8	# Detector 8
0x7EB8	# Balance to 99% of max counts or 32440
#0x1	# Calculate target setting and save
0x0	# Specifies that this is a sunrise event
0x5A	# Time: 90 seconds
0xBB86	# Cmd 15 balance detector
0x4	# 4 parameters
0x9	# Detector 9
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x0	# Specifies that this is a sunrise event
0x5A	# Time: 90 seconds
0xBB86	# Cmd 16 balance detector
0x4	# 4 parameters
0xA	# Detector 10
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x0	# Specifies that this is a sunrise event
0x5A	# Time: 90 seconds
0xBB86	# Cmd 17 balance detector
0x4	# 4 parameters
0xB	# Detector 11
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x0	# Specifies that this is a sunrise event
0x5A	# Time: 90 seconds
0xBB86	# Cmd 18 balance detector
0x4	# 4 parameters
0xC	# Detector 12
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x0	# Specifies that this is a sunrise event

0x5A	# Time: 90 seconds
0xBB86	# Cmd 19 balance detector
0x4	# 4 parameters
0xD	# Detector 13
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x0	# Specifies that this is a sunrise event
0x5A	# Time: 90 seconds
0xBB86	# Cmd 20 balance detector
0x4	# 4 parameters
0xE	# Detector 14
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x0	# Specifies that this is a sunrise event
0x5A	# Time: 90 seconds
0xBB86	# Cmd 21 balance detector
0x4	# 4 parameters
0xF	# Detector 15
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x0	# Specifies that this is a sunrise event
0x5A	# Time: 90 seconds
0xBB86	# Cmd 22 balance detector
0x4	# 4 parameters
0x10	# Detector 16
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x0	# Specifies that this is a sunrise event
0x99	# Time: 153 seconds
0xDD8D	# Cmd 23 disable track data
0x1	# one parameter
0x0	# stop taking data
0x0	
0x0	
0x0	
0x9B	# Time: 155 seconds
0xDD46	# Cmd 24 select standby_s
0x0	
0x0	
0x0	
0x0	
0x0	
0x9D	# Time: 157 seconds
0xBB29	# Cmd 25 set engineering data rate
0x1	# 1 parameters
0xF	# Specifies that an engineering data rate of 1/15
0x0	# Parameter placeholder
0x0	# Parameter placeholder
0x0	# Parameter placeholder
0x9E	# Time: 158 seconds
0xBB47	# Cmd 26 select standby
0x0	
0x0	

0x0	
0x0	
0x0	

A.2 Nominal Sunset Event Table 2

$Id: NominalSSScienceEventTable2,v 1.1 2006/11/03 15:29:00 greg Exp $
Nominal SS occultation Cal table 2
Comment lines begin with a # in column 1
Comments may also follow entries

Summary:
Each command has space for four parameters. If the command has fewer than four parameters, then space-holders are required; i.e. a command entry is required to have time, opcode, number of parameters and entries for four parameters (whether there are any parameters or not).

This table sets up the instrument for a Nominal Sunrise Event. All az and el scanning will be performed by the spacecraft.

Normally, the first command should be pass sun sensor tracking algorithm initialization table with an offset of zero seconds after event start.

History:

Date	Initials	Changes
# 2006/11/03	GJP	Rereleased with attenuator balance functions reapplied.
# 2006/09/08	GJP	Removed the track acquire bit commands.
# 2006/08/14	GJP	Initial Release (Modified from NominalSSScienceEventTable2 to reflect the changes necessary from a scanning mirror to a rigid mirror.)

0x2	# table id
0x45	# table size
0xBEEF	# checksum - placeholder only (The tool will fill this in)
0x9	# number of commands
0x0	# az table size
0x0	# el table size
0x0	# Time of command: 0 seconds
0xBB62	# Cmd 1 pass sun sensor tracking algorithm initialization table
0x0	# no parms
0x0	# Parameter placeholder
0x0	# Parameter placeholder
0x0	# Parameter placeholder
0x0	# Parameter placeholder
0x0	# Time of command: 0 seconds
0xBB29	# Cmd 2 set engineering data rate
0x1	# 1 parameters
0x1	# Specifies that an engineering data rate of 1/1
0x0	# Parameter placeholder
0x0	# Parameter placeholder
0x0	# Parameter placeholder
0x3	# Time of command: 3 seconds
0xBB49	# Cmd 3 select sofie science
0x0	# no parms
0x0	# Parameter placeholder
0x0	# Parameter placeholder

0x0	# Parameter placeholder
0x0	# Parameter placeholder
0x6	# Time: 6 seconds
0xDD47	# Cmd 4 select sofie science_s
0x0	# no parms
0x0	
0x0	
0x0	
0x0	
0x6	# Time: 6 seconds
0xBB8A	# Cmd 5 Load balance values from SRAM
0x1	# 1 parameters
0x1	# Specifies that this is a sunset event
0x0	
0x0	
0x0	
0x8	# Time: 8 seconds
0xDD8D	# Cmd 6 set track data
0x1	# one parameter
0x1	# begin taking data
0x0	
0x0	
0x0	
0x40	# Time: 64 seconds
0xBB86	# Cmd 7 balance detector
0x4	# 4 parameters
0x1	# Detector 1
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x1	# Specifies that this is a sunset event
0x40	# Time: 64 seconds
0xBB86	# Cmd 8 balance detector
0x4	# 4 parameters
0x2	# Detector 2
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x1	# Specifies that this is a sunset event
0x40	# Time: 64 seconds
0xBB86	# Cmd 9 balance detector
0x4	# 4 parameters
0x3	# Detector 3
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x1	# Specifies that this is a sunset event
0x40	# Time: 64 seconds
0xBB86	# Cmd 10 balance detector
0x4	# 4 parameters
0x4	# Detector 4
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x1	# Specifies that this is a sunset event
0x40	# Time: 64 seconds
0xBB86	# Cmd 11 balance detector

0x4	# 4 parameters
0x5	# Detector 5
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x1	# Specifies that this is a sunset event
0x40	# Time: 64 seconds
0xBB86	# Cmd 12 balance detector
0x4	# 4 parameters
0x6	# Detector 6
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x1	# Specifies that this is a sunset event
0x40	# Time: 64 seconds
0xBB86	# Cmd 13 balance detector
0x4	# 4 parameters
0x7	# Detector 7
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x1	# Specifies that this is a sunset event
0x40	# Time: 64 seconds
0xBB86	# Cmd 14 balance detector
0x4	# 4 parameters
0x8	# Detector 8
0x7EB8	# Balance to 99% of max counts or 32440
#0x1	# Calculate target setting and save
0x1	# Specifies that this is a sunset event
0x41	# Time: 65 seconds
0xBB86	# Cmd 15 balance detector
0x4	# 4 parameters
0x9	# Detector 9
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x1	# Specifies that this is a sunset event
0x41	# Time: 65 seconds
0xBB86	# Cmd 16 balance detector
0x4	# 4 parameters
0xA	# Detector 10
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x1	# Specifies that this is a sunset event
0x41	# Time: 65 seconds
0xBB86	# Cmd 17 balance detector
0x4	# 4 parameters
0xB	# Detector 11
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x1	# Specifies that this is a sunset event
0x41	# Time: 65 seconds
0xBB86	# Cmd 18 balance detector
0x4	# 4 parameters
0xC	# Detector 12
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save

0x1	# Specifies that this is a sunset event
0x41	# Time: 65 seconds
0xBB86	# Cmd 19 balance detector
0x4	# 4 parameters
0xD	# Detector 13
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x1	# Specifies that this is a sunset event
0x41	# Time: 65 seconds
0xBB86	# Cmd 20 balance detector
0x4	# 4 parameters
0xE	# Detector 14
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x1	# Specifies that this is a sunset event
0x41	# Time: 65 seconds
0xBB86	# Cmd 21 balance detector
0x4	# 4 parameters
0xF	# Detector 15
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x1	# Specifies that this is a sunset event
0x41	# Time: 65 seconds
0xBB86	# Cmd 22 balance detector
0x4	# 4 parameters
0x10	# Detector 16
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x1	# Specifies that this is a sunset event
0x94	# Time: 148 seconds
0xDD8D	# Cmd 23 disable track data
0x1	# one parameter
0x0	# stop taking data
0x0	
0x0	
0x0	
0x96	# Time: 150 seconds
0xDD46	# Cmd 24 select standby_s
0x0	
0x0	
0x0	
0x0	
0x0	
0x98	# Time: 152 seconds
0xBB29	# Cmd 25 set engineering data rate
0x1	# 1 parameters
0xF	# Specifies that an engineering data rate of 1/15
0x0	# Parameter placeholder
0x0	# Parameter placeholder
0x0	# Parameter placeholder
0x99	# Time: 153 seconds
0xBB47	# Cmd 26 select standby
0x0	

0x0	
0x0	
0x0	
0x0	

A.3 Nominal Sunrise Science Event Table 3

$Id: NominalSRScienceEventTable3,v 1.1 2006/11/03 15:29:00 greg Exp $
Nominal SR occultation Cal table 3
Comment lines begin with a # in column 1
Comments may also follow entries

Summary:
Each command has space for four parameters. If the command has fewer than four parameters, then space-holders are required; i.e. a command entry is required to have time, opcode, number of parameters and entries for four parameters (whether there are any parameters or not).

This table sets up the instrument for a Nominal Sunrise Event pixel telemetry mode. All az and el scanning will be performed by the spacecraft.

Normally, the first command should be pass sun sensor tracking algorithm initialization table with an offset of zero seconds after event start.

History:

Date	Initials	Changes
# 2006/11/03	GJP	Re-released with attenuator balance functions reapplied.
# 2006/09/22	GJP	Initial Release (Modified from NominalSRScienceEventTable1 to create a nominal sunrise event that will output pixel telemetry instead of the normal sums telemetry from the Sun Sensor Board

0x3	# table id
0x53	# table size
0xBEEF	# checksum - placeholder only (The tool will fill this in)
0xB	# number of commands
0x0	# az table size
0x0	# el table size
0x0	# Time of command: 0 seconds
0xBB62	# Cmd 1 pass sun sensor tracking algorithm initialization table
0x0	# no parms
0x0	# Parameter placeholder
0x0	# Parameter placeholder
0x0	# Parameter placeholder
0x0	# Parameter placeholder
0x0	# Time of command: 0 seconds
0xBB29	# Cmd 2 set engineering data rate
0x1	# 1 parameters
0x1	# Specifies that an engineering data rate of 1/1
0x0	# Parameter placeholder
0x0	# Parameter placeholder
0x0	# Parameter placeholder
0x3	# Time of command: 3 seconds
0xBB49	# Cmd 3 select sofie science
0x0	# no parms
0x0	# Parameter placeholder

0x0	# Parameter placeholder
0x0	# Parameter placeholder
0x0	# Parameter placeholder
0x6	# Time: 6 seconds
0xDD47	# Cmd 4 select sofie science_s
0x0	# no parms
0x0	
0x0	
0x0	
0x0	
0x6	# Time: 6 seconds
0xBB8A	# Cmd 5 Load balance values from SRAM
0x1	# 1 parameters
0x0	# Specifies that this is a sunrise event
0x0	
0x0	
0x0	
0x7	# Time: 7 seconds
0xDD88	# Cmd 6 Set SOFIE Pixel Telemetry
0x1	# 1 parameter
0x1	# Change Sun Sensor Telemetry Mode to Pixel
0x0	# Parameter placeholder
0x0	# Parameter placeholder
0x0	# Parameter placeholder
0x8	# Time: 8 seconds
0xDD8D	# Cmd 7 set track data
0x1	# one parameter
0x1	# begin taking data
0x0	
0x0	
0x0	
0x59	# Time: 89 seconds
0xBB86	# Cmd 8 balance detector
0x4	# 4 parameters
0x1	# Detector 1
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x0	# Specifies that this is a sunrise event
0x59	# Time: 89 seconds
0xBB86	# Cmd 9 balance detector
0x4	# 4 parameters
0x2	# Detector 2
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x0	# Specifies that this is a sunrise event
0x59	# Time: 89 seconds
0xBB86	# Cmd 10 balance detector
0x4	# 4 parameters
0x3	# Detector 3
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x0	# Specifies that this is a sunrise event
0x59	# Time: 89 seconds

0xBB86	# Cmd 11 balance detector
0x4	# 4 parameters
0x4	# Detector 4
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x0	# Specifies that this is a sunrise event
0x59	# Time: 89 seconds
0xBB86	# Cmd 12 balance detector
0x4	# 4 parameters
0x5	# Detector 5
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x0	# Specifies that this is a sunrise event
0x59	# Time: 89 seconds
0xBB86	# Cmd 13 balance detector
0x4	# 4 parameters
0x6	# Detector 6
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x0	# Specifies that this is a sunrise event
0x59	# Time: 89 seconds
0xBB86	# Cmd 14 balance detector
0x4	# 4 parameters
0x7	# Detector 7
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x0	# Specifies that this is a sunrise event
0x59	# Time: 89 seconds
0xBB86	# Cmd 15 balance detector
0x4	# 4 parameters
0x8	# Detector 8
0x7EB8	# Balance to 99% of max counts or 32440
#0x1	# Calculate target setting and save
0x0	# Specifies that this is a sunrise event
0x5A	# Time: 90 seconds
0xBB86	# Cmd 16 balance detector
0x4	# 4 parameters
0x9	# Detector 9
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x0	# Specifies that this is a sunrise event
0x5A	# Time: 90 seconds
0xBB86	# Cmd 17 balance detector
0x4	# 4 parameters
0xA	# Detector 10
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x0	# Specifies that this is a sunrise event
0x5A	# Time: 90 seconds
0xBB86	# Cmd 18 balance detector
0x4	# 4 parameters
0xB	# Detector 11
0x7EB8	# Balance to 99% of max counts or 32440

0x1	# Calculate target setting and save
0x0	# Specifies that this is a sunrise event
0x5A	# Time: 90 seconds
0xBB86	# Cmd 19 balance detector
0x4	# 4 parameters
0xC	# Detector 12
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x0	# Specifies that this is a sunrise event
0x5A	# Time: 90 seconds
0xBB86	# Cmd 20 balance detector
0x4	# 4 parameters
0xD	# Detector 13
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x0	# Specifies that this is a sunrise event
0x5A	# Time: 90 seconds
0xBB86	# Cmd 21 balance detector
0x4	# 4 parameters
0xE	# Detector 14
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x0	# Specifies that this is a sunrise event
0x5A	# Time: 90 seconds
0xBB86	# Cmd 22 balance detector
0x4	# 4 parameters
0xF	# Detector 15
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x0	# Specifies that this is a sunrise event
0x5A	# Time: 90 seconds
0xBB86	# Cmd 23 balance detector
0x4	# 4 parameters
0x10	# Detector 16
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x0	# Specifies that this is a sunrise event
0x99	# Time: 153 seconds
0xDD8D	# Cmd 24 disable track data
0x1	# one parameter
0x0	# stop taking data
0x0	
0x0	
0x0	
0x9A	# Time: 154 seconds
0xDD88	# Cmd 25 Set SOFIE Pixel Telemetry
0x1	# 1 parameter
0x0	# Change Sun Sensor Telemetry Mode to sums
0x0	# Parameter placeholder
0x0	# Parameter placeholder
0x0	# Parameter placeholder
0x9B	# Time: 155 seconds
0xDD46	# Cmd 26 select standby_s

0x0	
0x0	
0x0	
0x0	
0x0	
0x9D	# Time: 157 seconds
0xBB29	# Cmd 27 set engineering data rate
0x1	# 1 parameters
0xF	# Specifies that an engineering data rate of 1/15
0x0	# Parameter placeholder
0x0	# Parameter placeholder
0x0	# Parameter placeholder
0x9E	# Time: 158 seconds
0xBB47	# Cmd 28 select standby
0x0	
0x0	
0x0	
0x0	
0x0	

A.4 Nominal Sunset Science Event Table 4

$Id: NominalSSScienceEventTable4,v 1.1 2006/11/03 15:29:00 greg Exp $
Nominal SS occultation Cal table 4
Comment lines begin with a # in column 1
Comments may also follow entries

Summary:
Each command has space for four parameters. If the command has fewer than four parameters, then space-holders are required; i.e. a command entry is required to have time, opcode, number of parameters and entries for four parameters (whether there are any parameters or not).

This table sets up the instrument for a Nominal Sunrise Event pixel telemetry mode. All az and el scanning will be performed by the spacecraft.

Normally, the first command should be pass sun sensor tracking algorithm initialization table with an offset of zero seconds after event start.

History:

Date	Initials	Changes
# 2006/11/03	GJP	Re-released with attenuator balance functions reapplied.
# 2006/09/22	GJP	Initial Release (Modified from NominalSSScienceEventTable2 to create a nominal sunset event that will output pixel telemetry instead of the normal sums telemetry from the Sun Sensor Board.

0x4	# table id
0x53	# table size
0xBEEF	# checksum - placeholder only (The tool will fill this in)
0xB	# number of commands
0x0	# az table size
0x0	# el table size
0x0	# Time of command: 0 seconds
0xBB62	# Cmd 1 pass sun sensor tracking algorithm initialization table
0x0	# no parms

0x0	# Parameter placeholder
0x0	# Parameter placeholder
0x0	# Parameter placeholder
0x0	# Parameter placeholder
0x0	# Time of command: 0 seconds
0xBB29	# Cmd 2 set engineering data rate
0x1	# 1 parameters
0x1	# Specifies that an engineering data rate of 1/1
0x0	# Parameter placeholder
0x0	# Parameter placeholder
0x0	# Parameter placeholder
0x3	# Time of command: 3 seconds
0xBB49	# Cmd 3 select sofie science
0x0	# no parms
0x0	# Parameter placeholder
0x0	# Parameter placeholder
0x0	# Parameter placeholder
0x0	# Parameter placeholder
0x6	# Time: 6 seconds
0xDD47	# Cmd 4 select sofie science_s
0x0	# no parms
0x0	# Parameter placeholder
0x0	# Parameter placeholder
0x0	# Parameter placeholder
0x0	# Parameter placeholder
0x6	# Time: 6 seconds
0xBB8A	# Cmd 5 Load balance values from SRAM
0x1	# 1 parameters
0x1	# Specifies that this is a sunset event
0x0	
0x0	
0x0	
0x7	# Time: 7 seconds
0xDD88	# Cmd 6 Set SOFIE Pixel Telemetry
0x1	# 1 parameter
0x1	# Change Sun Sensor Telemetry Mode to Pixel
0x0	# Parameter placeholder
0x0	# Parameter placeholder
0x0	# Parameter placeholder
0x8	# Time: 8 seconds
0xDD8D	# Cmd 7 set track data
0x1	# one parameter
0x1	# begin taking data
0x0	
0x0	
0x0	
0x40	# Time: 64 seconds
0xBB86	# Cmd 8 balance detector
0x4	# 4 parameters
0x1	# Detector 1
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x1	# Specifies that this is a sunset event

0x40	# Time: 64 seconds
0xBB86	# Cmd 9 balance detector
0x4	# 4 parameters
0x2	# Detector 2
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x1	# Specifies that this is a sunset event
0x40	# Time: 64 seconds
0xBB86	# Cmd 10 balance detector
0x4	# 4 parameters
0x3	# Detector 3
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x1	# Specifies that this is a sunset event
0x40	# Time: 64 seconds
0xBB86	# Cmd 11 balance detector
0x4	# 4 parameters
0x4	# Detector 4
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x1	# Specifies that this is a sunset event
0x40	# Time: 64 seconds
0xBB86	# Cmd 12 balance detector
0x4	# 4 parameters
0x5	# Detector 5
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x1	# Specifies that this is a sunset event
0x40	# Time: 64 seconds
0xBB86	# Cmd 13 balance detector
0x4	# 4 parameters
0x6	# Detector 6
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x1	# Specifies that this is a sunset event
0x40	# Time: 64 seconds
0xBB86	# Cmd 14 balance detector
0x4	# 4 parameters
0x7	# Detector 7
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x1	# Specifies that this is a sunset event
0x40	# Time: 64 seconds
0xBB86	# Cmd 15 balance detector
0x4	# 4 parameters
0x8	# Detector 8
0x7EB8	# Balance to 99% of max counts or 32440
#0x1	# Calculate target setting and save
0x1	# Specifies that this is a sunset event
0x41	# Time: 65 seconds
0xBB86	# Cmd 16 balance detector
0x4	# 4 parameters
0x9	# Detector 9

0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x1	# Specifies that this is a sunset event
0x41	# Time: 65 seconds
0xBB86	# Cmd 17 balance detector
0x4	# 4 parameters
0xA	# Detector 10
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x1	# Specifies that this is a sunset event
0x41	# Time: 65 seconds
0xBB86	# Cmd 18 balance detector
0x4	# 4 parameters
0xB	# Detector 11
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x1	# Specifies that this is a sunset event
0x41	# Time: 65 seconds
0xBB86	# Cmd 19 balance detector
0x4	# 4 parameters
0xC	# Detector 12
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x1	# Specifies that this is a sunset event
0x41	# Time: 65 seconds
0xBB86	# Cmd 20 balance detector
0x4	# 4 parameters
0xD	# Detector 13
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x1	# Specifies that this is a sunset event
0x41	# Time: 65 seconds
0xBB86	# Cmd 21 balance detector
0x4	# 4 parameters
0xE	# Detector 14
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x1	# Specifies that this is a sunset event
0x41	# Time: 65 seconds
0xBB86	# Cmd 22 balance detector
0x4	# 4 parameters
0xF	# Detector 15
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x1	# Specifies that this is a sunset event
0x41	# Time: 65 seconds
0xBB86	# Cmd 23 balance detector
0x4	# 4 parameters
0x10	# Detector 16
0x7EB8	# Balance to 99% of max counts or 32440
0x1	# Calculate target setting and save
0x1	# Specifies that this is a sunset event
0x99	# Time: 153 seconds

0xDD8D	# Cmd 24 disable track data
0x1	# one parameter
0x0	# stop taking data
0x0	
0x0	
0x0	
0x9A	# Time: 154 seconds
0xDD88	# Cmd 25 Set SOFIE Pixel Telemetry
0x1	# 1 parameter
0x0	# Change Sun Sensor Telemetry Mode to sums
0x0	# Parameter placeholder
0x0	# Parameter placeholder
0x0	# Parameter placeholder
0x9B	# Time: 155 seconds
0xDD46	# Cmd 26 select standby_s
0x0	
0x0	
0x0	
0x0	
0x0	
0x9D	# Time: 157 seconds
0xBB29	# Cmd 27 set engineering data rate
0x1	# 1 parameters
0xF	# Specifies that an engineering data rate of 1/15
0x0	# Parameter placeholder
0x0	# Parameter placeholder
0x0	# Parameter placeholder
0x9E	# Time: 158 seconds
0xBB47	# Cmd 28 select standby
0x0	
0x0	
0x0	
0x0	
0x0	

A.5 Sun Sensor Tracking State Return Values

State	Hex Code	Decimal Code
SM_INIT_STATE	0x0000	0
SM_SEARCH_STATE_0	0x1000	4096
SM_SEARCH_STATE_1	0x2000	8192
SM_SEARCH_STATE_2	0x3000	12288
SM_SEARCH_STATE_3	0x4000	16384
SM_SEARCH_STATE_4	0x5000	20480
SM_COARSE_STATE_0	0x6000	24576
SM_COARSE_STATE_1	0x7000	28672
SM_COARSE_STATE_2	0x8000	32768
SM_COARSE_STATE_3	0x9000	36864
SM_COARSE_STATE_4	0xA000	40960
SM_FINE_STATE_0	0xB000	45056
SM_FINE_STATE_1	0xC000	49152
SM_FINE_STATE_2	0xD000	53248
SM_FINE_STATE_3	0xE000	57344
SM_FINE_STATE_4	0xF000	61440

A.6 Sun Sensor Tracking Error Codes

Error	Hex Code
EDGE_NOT_FOUND_LIGHT	0x0001
EDGE_NOT_FOUND_DARK	0x0002
IMAGE_NOT_FOUND	0x0004
PARTIAL_IMAGE_FOUND	0x0008
FPA_IO_GET_ERROR	0x0010
CHECK_ROI_ERROR	0x0020
SET_ROI_ERROR	0x0040
ELEVATION_EDGE	0x0080
AZIMUTH_EDGE	0x0100
MC_ERR_OOB	0x0200
NOISE_FLOOR_ERROR	0x0400

APPENDIX B AIM-SOFIE COMMAND & TELEMETRY HANDBOOK

Laboratory for Atmospheric and Space Physics
LASP Engineering Division
University of Colorado
Boulder, Colorado

Aeronomy of Ice in the Mesosphere
(AIM)

SOFIE
Command & Telemetry Handbook

Document No. SDL/05-936 Revision: A Date: July 11, 2006

Laboratory for Atmospheric and Space Physics
LASP Engineering Division
University of Colorado
Boulder, Colorado

Aeronomy of Ice in the Mesosphere
(AIM)

SOFIE
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Document No. SDL/05-936 Revision: A Date: July 11, 2006

Aeronomy of Ice in the Mesosphere
(AIM)

SOFIE
Command & Telemetry Handbook

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Approval

Written by: _____ Date _____

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Revisions				
Rev.	Description of Change	By	Approved	Date
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Contents

A

Command Verb Summary

verb phrase	*discrete*	*comment*
arm	yes	A prerequisite command for a potentially hazardous command.
close	yes	Mechanically close a device controlled by the command element. *close* works in conjunction with the *open* verb.
disable	yes	Deactivate a capability or function. *disable* works in conjunction with the *enable* verb.
dump	no	Copy a specific data buffer of the command element to telemetry.
enable	yes	Activate a capability or function. *enable* works in conjunction with the *disable* verb.
inform	no	Inform an object of some current data.
init	no	Begin a software function with an initial paramter. *init* works in conjunction with the *term* verb.
issue	yes	Send a telemetry packet.
move	no	Move a machanical object from one position to another.
noop	yes	Instruct the command element to perform **no op**eration or 'do nothing'. *noop* commands are typically used to verify a command path without disturbing configuration.
observe	no	Science observation sequencing command.
open	yes	Mechanically open a device controlled by the command element. *open* works in conjunction with the *close* verb.

verb phrase	*discrete*	*comment*
pass	yes	Pass subfield data unmodified to a secondary hardware or software command receiver.
safe	yes	Configure a device to a safe state. *safe* works in conjunction with the *wake* verb.
select	yes	Select one of multiple discrete positions or modes.
set	no	Vary a continuous range parameter.
stuff	no	Load a given data set into memory at a given location.
suspend	yes	Pause command interpretation until an event occurs.
term	yes	End a software function. *term* works in conjunction with the *init* verb.
turn off	yes	Remove power from, or deactivate a device. *turn off* works in conjunction with the *turn on* verb.
turn on	yes	Apply power to, or activate a device. *turn on* works in conjunction with the *turn off* verb.
wake	yes	Wake the hardware from a safe state. *wake* works in conjunction with the *safe* verb.

B

Command List

OASIS-CC/FSW database version TBD, Tue Jul 11 10:08:51 2006.

B.1 inform inst acs_state

Packet Target Application Identifier

inst, 0x15e, (350)

Description

Spacecraft ACS status update command.

Discussion

Inform the instruments of the current spacecraft attitude control subsystem (ACS) status.

Constraints

This command does not directly command or reconfigure science instruments. Though each instrument is programmable to respond to different ACS status values under multiple conditions.

Command Target

software

Format

	opcode	subfield(s)							
	0xfe	filler_1	filler_2	seconds	subseconds	sc_to_sun_u_x	sc_to_sun_u_y	sc_to_sun_u_z	filler_3
bit	0 7	8 15	16 79	80 111	112 143	144 207	208 271	272 335	336 447

Command size = 448 bits = 56 bytes.

Subfield(s)

filler_1: Filler data to match OSC command structure.

bits	type	eng units	min (dn)	max (dn)	state	value
8	unsigned integer	any	0	0	default	0

filler_2: Filler data to match OSC command structure.

bits	type	eng units	min (dn)	max (dn)	state	value
64	unsigned integer	any	0	0	default	0

seconds: Seconds field of timestamp.

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer	any	0	4294967295	default	0

subseconds: Fractional part of timestamp.

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer	any	0	4294967295	default	0

sc_to_sun_u_x: Spacecraft to sun unit vector, spacecraft body frame, cartesian x coordinate.

bits	type	eng units	min (dn)	max (dn)	state	value
64	float	any	0	0	default	0

sc_to_sun_u_y: Spacecraft to sun unit vector, spacecraft body frame, cartesian y coordinate.

bits	type	eng units	min (dn)	max (dn)	state	value
64	float	any	0	0	default	0

sc_to_sun_u_z: Spacecraft to sun unit vector, spacecraft body frame, cartesian z coordinate.

bits	type	eng units	min (dn)	max (dn)	state	value
64	float	any	0	0	default	0

filler_3: Filler data to match OSC command structure.

bits	type	eng units	min (dn)	max (dn)	state	value
112	unsigned integer	any	0	0	default	0

Safety Level

SAFE

Telemetry Verification

B.2 inform inst sc_clock

Packet Target Application Identifier

inst, 0x15d, (349)

Description

Notify FSW of spacecraft time at next time sync.

Discussion

Notify FSW of the spacecraft clock time at the next sync mode code upon the 1553 bus.

Constraints

By itself, this command will not set the instrument propogated spacecraft clock. To set the clock, this command must be followed by a MIL-STD-1553 SYNC mode code within TBD seconds.

An incorrect value of spacecraft clock can seriously degrade instrument command sequencing and the resulting collection of science data.

Command Target

software

Format

	opcode	subfield(s)			
	0xfc	reserved	seconds	subseconds	Command size = 80 bits = 10 bytes.
bit	0 7	8 15	16 47	48 79	

Subfield(s)

reserved: Pad for even command length.

bits	type	eng units	min (dn)	max (dn)	state	value
8	unsigned integer	any	0	255	default	0

seconds: Integral seconds portion of spacecraft clock.

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer	any	0	4294967295	default	0

subseconds: Integral subseconds portion of spacecraft clock.

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer	any	0	4294967295	default	0

subseconds discussion:

Each bit represents 2 to the -32 seconds.

Safety Level

SAFE

Telemetry Verification

B.3 arm sofie cover_rls

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Arm Dust Cover Release

Discussion

Arms the aperture dust cover release mechanism.

Valid parameters are:

1 = pinpuller 1A,

2 = pinpuller 1B,

3 = pinpuller 2A,

4 = pinpuller 2B

Constraints

Dust cover commands can only be executed in Safe Mode. If the C&DH is not in Safe Mode an Invalid Mode error will be generated and the command will be ignored. If the dust cover is not released within 10 seconds of being armed, a dust cover timeout error message will be issued and the dust cover arm and release will be reset. If this timeout occurs the dust cover arm and release sequence will need to be restarted.

Command Target

sofie

Format

	opcode	subfield(s)
	0xbb44	pinpuller

Command size = 32 bits = 4 bytes.

bit 0 15 16 31

Subfield(s)

pinpuller: 0x01 = pin puller 1A, 0x02 = pin puller 1B, 0x03 = pin puller 2A, 0x04 = pin pul

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

Safety Level

SAFE

Telemetry Verification

B.4 dump sofie cdh_sram1

Packet Target Application Identifier

sofie, 0x183, (387)

Description

C&DH Data (Operand) SRAM Memory Dump

Discussion

Returns a block of up to 467 words of C&DH Data SRAM contents. The data dump is preceded by a header which includes C&DH data SRAM memory dump opcode, OD address of the dump (or 0xFFFF if lower SRAM), start address within the memory bank, and length of the requested data.

Constraints

The C&DH Self Test and Diagnostics Handler passes this command to the C&DH Memory Dump Queue. If a requested data dump has a length past the end of the bank, then the dump wraps around to the beginning of the bank and continues getting data from there. If the lower SRAM flag is TRUE then lower SRAM is transferred, otherwise upper SRAM data is transferred (OD address 0). A memory dump of SRAM is limited in size to what will fit in the

1553 telemetry buffer. This value is 15 messages * 32 words - 7 word CCSDS header - 2 word checksum - 4 words of dump header = 467 words. If the requested size is larger than this then the dump is truncated to the maximum allowable size and an X44_CDH_DATA_DUMP_REQUEST_SIZE_TRUNCATED error (with requested length in additional error data field) is generated. If lower SRAM is being dumped then 0xFFFF is used as the OD address in the dump header.

Command Target

sofie

Format

	opcode	subfield(s)						
	0xbba7	lwr_sram_flag		address		length		Command size = 64 bits = 8 bytes.
bit	0 15	16	31	32	47	48	63	

Subfield(s)

lwr_sram_flag: lower SRAM flag

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

address: address of Data (Operand) SRAM Memory Dump C&DH

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

length: length

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

Safety Level

SAFE

Telemetry Verification

B.5 dump sofie cdh_sram2

Packet Target Application Identifier

sofie, 0x183, (387)

Description

C&DH Instruction SRAM Memory Dump

Discussion

Returns a block of up to 467 words of C&DH Instruction SRAM contents. The C&DH code dump is preceded by a header which includes C&DH instruction SRAM memory dump opcode, most significant portion of the start address, least significant word of the start address, and length of the requested data.

Constraints

The C&DH Self Test and Diagnostics Handler passes this command to the C&DH Memory Dump Queue. If a requested code dump has a length past the end of the code memory, then the dump wraps around to the beginning

of code memory and continues getting data. A memory dump of instruction memory is limited in size to what will fit in the 1553 telemetry buffer. This value is 15 messages * 32 words - 7 word CCSDS header - 2 word checksum - 4 words of dump header = 467 words. If the requested size is larger than this then the dump is truncated to the maximum allowable size and an X44_CDH_CODE_DUMP_REQUEST_SIZE_TRUNCATED error (with requested length in additional error data field) is generated.

Command Target

sofie

Format

	opcode	subfield(s)			
	0xbba8	address		length	Command size = 64 bits = 8 bytes.
bit	0 15	16 47		48 63	

Subfield(s)

address: for Instruction SRAM Memory Dump C&DH

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer	dn	0	4294967295	default	0

length: length

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

Safety Level

SAFE

Telemetry Verification

B.6 dump sofie eeprom

Packet Target Application Identifier

sofie, 0x183, (387)

Description

EEPROM Memory Dump

Discussion

Returns a block of up to 467 words of EEPROM contents. The EEPROM data is preceded by a header which includes the EEPROM memory dump opcode, OD address of the EEPROM bank, start address within the EEPROM bank, and length of the requested data.

Constraints

The C&DH Self Test and Diagnostics Handler passes this command to the C&DH Memory Dump Queue. If a requested EEPROM dump has a length past the end of the bank, then the dump wraps around to the beginning of the bank and continues getting data from there. A memory dump of EEPROM is limited in size to what will fit in the 1553 telemetry buffer. This value is 15 messages * 32 words - 7 word CCSDS header - 2 word checksum - 4 word dump header = 467 words. If the request is larger than this the dump is truncated to the maximum allowable size and

an X44_EEPROM_DUMP_REQUEST_SIZE_TRUNCATED error (with requested length in additional error data field) is generated. If the data cannot be read from EEPROM an X44_EEPROM_DUMP_UNABLE_TO_COPY_DATA error (with command opcode in additional error data field) is generated.

Command Target

sofie

Format

	opcode	subfield(s)		
	0xbba6	OD_address	address	length
bit	0 15	16 31	32 47	48 63

Command size = 64 bits = 8 bytes.

Subfield(s)

OD_address: bank select OD bits for memory address EEPROM

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

address: memory address EEPROM

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

length: length

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

Safety Level

SAFE

Telemetry Verification

B.7 dump sofie ssb_sram1

Packet Target Application Identifier

sofie, 0x183, (387)

Description

SS&SM Data (Operand) SRAM Memory Dump

Discussion

Returns a block of up to 256 words of SSB Data SRAM contents. The SSB data dump is preceded by a header which includes SSB data memory dump opcode, OD address of the dump (or 0xFFFF if lower SRAM), start address within the memory bank, and length of the requested data.

Constraints

If a requested data dump has a length past the end of the bank, then the dump wraps around to the beginning of the bank and continues getting data from there. If the lower SRAM flag is TRUE then lower SRAM is transferred, otherwise upper SRAM data is transferred (OD address 0). Due to data transfer constraints a sun sensor board (SSB) data dump is

limited to 256 data words. If the requested size is larger than this then the dump is truncated to the maximum allowable size and an X84_SSB_DATA_DUMP_REQUEST_SIZE_TRUNCATED error (with requested length in additional error data field) is generated.

Command Target

sofie

Format

	opcode	subfield(s)		
	0xdda3	lwr_sram_flag	address	length

Command size = 64 bits = 8 bytes.

bit 0 15 16 31 32 47 48 63

Subfield(s)

lwr_sram_flag: lower SRAM flag

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

address: address of Data (Operand) SRAM Memory Dump SS&SM

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

length: length

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

Safety Level

SAFE

Telemetry Verification

B.8 dump sofie ssb_sram2

Packet Target Application Identifier

sofie, 0x183, (387)

Description

SS&SM Instruction SRAM Memory Dump

Discussion

Returns a block of up to 256 words of SSB Instruction SRAM contents. The SSB code dump is preceded by a header which includes SSB instruction memory dump opcode, most significant portion of the start address, least significant word of the start address, and length of the requested data.

Constraints

If a requested code dump has a length past the end of code memory, then the dump wraps around to the beginning of code memory and continues getting data from there. Due to data transfer constraints a sun sensor board (SSB)

code dump is limited to 256 words. If the requested size is larger than this then the dump is truncated to the maximum allowable size and an X84_SSB_CODE_DUMP_REQUEST_SIZE_TRUNCATED error (with requested length in additional error data field) is generated.

Command Target

sofie

Format

	opcode	subfield(s)	
	0xdda4	address	length
bit	0 15	16 47	48 63

Command size = 64 bits = 8 bytes.

Subfield(s)

address: address for Instruction SRAM Memory Dump SS&SM

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer	dn	0	4294967295	default	0

length: length

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

Safety Level

SAFE

Telemetry Verification

B.9 enable sofie servos

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Enable SSG servos

Discussion

Notifies SSG hardware that we are about to begin using the steering mirror to find and track the sun. SSG hardware performs hardware initialization and closes the loop, activating the servos.

Command Target

sofie

Format

	opcode
	0xcc01
bit	0 15

Command size = 16 bits = 2 bytes.

Subfield(s)

Safety Level
SAFE

Telemetry Verification

B.10 enable sofie servosT

Packet Target Application Identifier
sofie, 0x181, (385)

Description
Enable SSG servos (Timed Execution)

Discussion
See enable_servos.

Command Target
sofie

Format

	opcode	subfield(s)	
	0xcc01	Time	Command size = 48 bits = 6 bytes.
bit	0 15	16 47	

Subfield(s)
Time: Time of command execution

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer				default	

Safety Level
SAFE

Telemetry Verification

B.11 get sofie cdh_reg

Packet Target Application Identifier
sofie, 0x183, (387)

Description
Query C&DH FPGQ Register

Discussion

Returns the contents of selected C&DH FPGA register to the System Data Packet.

Constraints

Valid OD_address parameters are:

4 = ARP FPGA,

6 = DAQ FPGA.

Any other value will result in an invalid FPGA bank error. This command generates a three word response: word 1 = OD address, word 2 = Register address, word 3 = value

Command Target

sofie

Format

	opcode	subfield(s)	
	0xbba0	OD_address	address
bit	0 15	16 31	32 47

Command size = 48 bits = 6 bytes.

Subfield(s)

OD_address: bank select OD bits for register address.

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	any	0	65535	default	0

address: the register address.

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	any	0	65535	default	0

Safety Level

SAFE

Telemetry Verification

B.12 get sofie cdh_sram

Packet Target Application Identifier

sofie, 0x183, (387)

Description

Read value from C&DH data SRAM

Discussion

Returns the value of a single C&DH SRAM address to the System Data Packet. This command reads a one word data value from the requested C&DH data SRAM address. This command generates a two word response: word 1 = requested address, word 2 = value read from data SRAM.

Command Target

sofie

Format

	opcode	subfield(s)
	0xbbaa	address

Command size = 32 bits = 4 bytes.

bit 0 15 16 31

Subfield(s)

address: Address of data value to get

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

Safety Level

SAFE

Telemetry Verification

B.13 get sofie event_info

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Get Event Information

Discussion

Returns event information about the requested event number. The get event info opcode, requested event number, event absolute start time (in whole seconds), and event table number are returned in the free format area of the system data packet.

Constraints

If the science event table has not been setup then this command will generate an X4D_ERROR_EVENT_TABLE_NOT_SET_UP with the requested event number in the data field. If the requested event number is less than the range contained in the science event table, an X4D_EVENT_NUMBER_OUTSIDE_CURRENT_RANGE_LOW error will be generated with the requested event number in the data field. If the requested event number is larger than the range contained in the science event table, an X4D_EVENT_NUMBER_OUTSIDE_CURRENT_RANGE_HIGH error will be generated with the requested event number in the data field.

Command Target

sofie

Format

	opcode	subfield(s)
	0xbb4d	event_number

Command size = 32 bits = 4 bytes.

bit 0 15 16 31

Subfield(s)

event_number: Event number

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

Safety Level

SAFE

Telemetry Verification

B.14 get sofie next_event

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Get Next Event Information

Discussion

Returns information specific to the next event in the science event table and general information about the entire science event table. This command returns the get next event opcode, start event number in the science event table, ending event number, next event number (should always be the same as the start event number), absolute start time for the next event, and event command table number for the next event. This information is returned in the system data packet.

Constraints

If the science event table has not been setup then this command will return all zeroes (other than the command opcode) in the system data packet.

Command Target

sofie

Format

opcode
0xbb4e

Command size = 16 bits = 2 bytes.

bit 0 15

Subfield(s)

Safety Level

SAFE

Telemetry Verification

B.15 get sofie ssb_oper

Packet Target Application Identifier

sofie, 0x180, (384)

Description

SSB Operational? Request

Discussion

Are you alive? query from C&DH to SSB. It is used by the C&DH board to determine if the SSB is functional and ready to receive an operational software CSCI image from the C&DH board.

Constraints

This command is a SOFIE internal command and is not intended to be issued from the ground.

Command Target

sofie

Format

	opcode
	0xdd43

Command size = 16 bits = 2 bytes.

bit 0 15

Subfield(s)

Safety Level

SAFE

Telemetry Verification

B.16 get sofie ssb_reg

Packet Target Application Identifier

sofie, 0x183, (387)

Description

Query SSB FPGS Register

Discussion

Returns the contents of selected SSB FPGA register to the System Data Packet.

Constraints

Valid OD_address parameter is 4. Any other value will result in an invalid FPGA bank error. This command generates a three word response: word 1 = OD address, word 2 = Register address, word 3 = value.

Command Target

sofie

Format

	opcode	subfield(s)	
	0xdda0	OD_address	address
bit	0 15	16 31	32 47

Command size = 48 bits = 6 bytes.

Subfield(s)

OD_address: bank select OD bits for register address.

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	any	0	65535	default	0

address: the register address.

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	any	0	65535	default	0

Safety Level

SAFE

Telemetry Verification

B.17 get sofie ssb_sram

Packet Target Application Identifier

sofie, 0x183, (387)

Description

Read value from SSB data SRAM

Discussion

Returns the value of a single SSB SRAM address to the System Data Packet. This command reads a one word data value from the requested SSB data SRAM address. This command generates a two word response: word 1 = requested address, word 2 = value read from data SRAM.

Command Target

sofie

Format

	opcode	subfield(s)
	0xdda7	address
bit	0 15	16 31

Command size = 32 bits = 4 bytes.

Subfield(s)

address: Address of data value to get

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

Safety Level

SAFE

Telemetry Verification

B.18 get sofie ssb_status

Packet Target Application Identifier

sofie, 0x180, (384)

Description

SSB Status Request

Discussion

Are you operational? query from C&DH to SSB It is used by the C&DH board to determine if the SSB is operational.

Constraints

This command is a SOFIE internal command and is not intended to be issued from the ground.

Command Target

sofie

Format

	opcode
	0xdd42

Command size = 16 bits = 2 bytes.

bit 0 15

Subfield(s)

Safety Level

SAFE

Telemetry Verification

B.19 get sofie ssg_PIDreg

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Request SSG gain register values

Discussion

This command requests that the gain register values be transmitted. The SSG hardware responds by generating a message that contains all 8 gain register values.

Command Target

sofie

Format

opcode
0xcc14

Command size = 16 bits = 2 bytes.

bit 0 15

Subfield(s)

Safety Level

SAFE

Telemetry Verification

B.20 get sofie ssg_PIDregT

Packet Target Application Identifier

sofie, 0x181, (385)

Description

Request SSG gain register values (Timed Execution)

Discussion

See get_ssg_PIDreg.

Command Target

sofie

Format

opcode	subfield(s)
0xcc14	Time

Command size = 48 bits = 6 bytes.

bit 0 15 16 47

Subfield(s)

Time: Time of command execution

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer				default	

Safety Level

SAFE

Telemetry Verification

B.21 get sofie ssg_peek

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Read SSG memory register

Discussion

This command reads any available register in memory. The desired register is specified by 'address'. The SSG hardware responds by generating a message that echoes the 'address' and provides the register's 'value'.

Command Target

sofie

Format

	opcode	subfield(s)
	0xccf0	address

Command size = 32 bits = 4 bytes.

bit 0 15 16 31

Subfield(s)

address: address of register to examine

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

Safety Level

SAFE

Telemetry Verification

B.22 get sofie ssg_peekT

Packet Target Application Identifier

sofie, 0x181, (385)

Description

Read SSG memory register (Timed Execution)

Discussion

See get_ssg_peek.

Command Target

sofie

Format

	opcode	subfield(s)	
	0xccf0	Time	address
bit	0 15	16 47	48 63

Command size = 64 bits = 8 bytes.

Subfield(s)

Time: Time of command execution

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer				default	

address: address of register to examine

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

Safety Level

SAFE

Telemetry Verification

B.23 get sofie ssg_posit

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Request SSG azimuth and elevation

Discussion

Requests the SSG hardwae transmit only the azimuth and elevation. The SSG board replies with a packet that contains time, azimuth, and elevation. This reply is generated only once.

Command Target

sofie

Format

	opcode
	0xcc13
bit	0 15

Command size = 16 bits = 2 bytes.

Subfield(s)

Safety Level

SAFE

Telemetry Verification

B.24 get sofie ssg_positT

Packet Target Application Identifier

sofie, 0x181, (385)

Description

Request SSG azimuth and elevation (Timed Execution)

Discussion

See get_ssg_posit.

Command Target

sofie

Format

	opcode	subfield(s)
	0xcc13	Time

Command size = 48 bits = 6 bytes.

bit 0 15 16 47

Subfield(s)

Time: Time of command execution

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer				default	

Safety Level

SAFE

Telemetry Verification

B.25 get sofie ssg_state

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Toggle On/Off SSG state data

Discussion

Valid parameters are:

0x0000 = Do not transmit state.

0x0001 = Transmit state at rate specified by register.

There is no response to this command: however, if the system is set to begin transmitting state, it will transmit a state packet at a frequency set in the State Update Rate register (0x0004).

Command Target

sofie

Format

	opcode	subfield(s)
	0xcc11	state_on
bit	0 15	16 31

Command size = 32 bits = 4 bytes.

Subfield(s)

state_on: 0x0000-Do not transmit state, 0x0001-Transmit state at rate specified by registe

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

Safety Level

SAFE

Telemetry Verification

B.26 get sofie ssg_stateT

Packet Target Application Identifier

sofie, 0x181, (385)

Description

Toggle On/Off SSG state data (Timed Execution)

Discussion

See get_ssg_state.

Command Target

sofie

Format

	opcode	subfield(s)	
	0xcc11	Time	state_on
bit	0 15	16 47	48 63

Command size = 64 bits = 8 bytes.

Subfield(s)

Time: Time of command execution

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer				default	

state_on: 0x0000-Do not transmit state, 0x0001-Transmit state at rate specified by registe

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

Safety Level

SAFE

Telemetry Verification

B.27 get sofie ssg_status

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Toggle On/Off SSG status bits

Discussion

Valid parameters are:

0x0000 = Do not transmit status.

0x0001 = Transmit status at rate specified by register.

There is no response to this command: however, if the system is set to begin transmitting status, it will transmit a status packet at a frequency set in the Status Update Rate register (0x0003).

Command Target

sofie

Format

	opcode	subfield(s)
	0xcc10	status_on

Command size = 32 bits = 4 bytes.

bit 0 15 16 31

Subfield(s)

status_on: 0x0000-Do not transmit status, 0x0001-Transmit status at rate specified by regis

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

Safety Level

SAFE

Telemetry Verification

B.28 get sofie ssg_statusT

Packet Target Application Identifier

sofie, 0x181, (385)

Description

Toggle On/Off SSG status bits (Timed Execution)

Discussion

See get_ssg_status.

Command Target

sofie

Format

	opcode	subfield(s)				
	0xcc10	Time		status_on		Command size = 64 bits = 8 bytes.
bit	0 15	16	47	48	63	

Subfield(s)

Time: Time of command execution

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer				default	

status_on: 0x0000-Do not transmit status, 0x0001-Transmit status at rate specified by regis

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

Safety Level

SAFE

Telemetry Verification

B.29 get sofie sunimage1

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Capture and download a sun image

Discussion

The actual sun sensor image dump packets are preceded by a command response dump packet which includes the get_sunimage1 opcode and an echo of each of the parameters used in the get sun image request.

Constraints

This command can be issued from any SSB Mode but the image will ONLY be downloaded when the SSB is in Standby Mode. This command does the following:

1. Writes Sun Sensor image capture setup parameters to the correct SSB FPGA registers. It is the operators responsibility to assure that the setup parameter values are correct.

2. Writes Sun Sensor image capture information to the SSB Data SRAM that is used by the SSB Interrupt and Task Manager to download the Sun Sensor image. It is the operators responsibility to assure that the image capture information are correct.

3. Writes a value to a FPGA register to start a Sun Sensor image capture.

4. Echoes the command by writing the command to the SSB Data Queue.

The command is echoed so that the Ground Support Software can decode the image as it is downloaded. Note that the image is actually downloaded by the SSB Interrupt and Task Manager. The SSB Interrupt and Task Manger times calls to the SSB data dump command so that there are no overflows in the data transfer queues.

Command Target

sofie

Format

	opcode	subfield(s)															
	0xdd86	fpa_x1	fpa_x2	fpa_y1	fpa_y2	fpa_step_size	fpa_int_time	fpa_rst_band	fpa_rst_time	fpa_row_tim
bit	0 15	16 31	32 47	48 63	64 79	80 95	96 111	112 127	128 143	144 15

Command size = 192 bits = 24 bytes.

Subfield(s)

fpa_x1: Sun Sensor X1 Block Coordinate

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

fpa_x2: Sun Sensor X2 Block Coordinate

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

fpa_y1: Sun Sensor Y1 Block Coordinate

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

fpa_y2: Sun Sensor Y2 Block Coordinate

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

fpa_step_size: Sun Sensor pixel return step size. X and Y bytes.

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

fpa_int_time: Pixel integration time; integer multiple of fpa_row_time.

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

fpa_rst_band: Anti-blooming. Number of pixel rows to reset on each side of the row to be retur

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

fpa_rst_time: Count represents the time required to reset rows given fps_rst_band

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

fpa_row_time: Count represents the time required to read one complete row.

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

fpa_mem_offset: Memory offset for location to return image sensor data.

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

image_length: Number of data words of making up the sun image.

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

Safety Level

SAFE

Telemetry Verification

B.30 get sofie sys_message

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Send system data messages

Discussion

Request immediate transmission of System Data Packet. This command calls the csc08EngineeringDataHandler function and the csc08SystemDataHandler function to update the System Data Packet. It then calls the dat_hdlr function with a flag to force the 1553 data handler to send the System Data Packet.

Command Target

sofie

Format

	opcode
	0xbb88
bit	0 15

Command size = 16 bits = 2 bytes.

Subfield(s)

Safety Level
SAFE

Telemetry Verification

B.31 get sofie sys_messageT

Packet Target Application Identifier
sofie, 0x181, (385)

Description
Send system data messages (Timed execution)

Command Target
sofie

Format

	opcode	subfield(s)	
	0xbb88	Time	Command size = 48 bits = 6 bytes.
bit	0 15	16 47	

Subfield(s)

Time: Time of command execution

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer				default	

Safety Level
SAFE

Telemetry Verification

B.32 inform sofie acs_state

Packet Target Application Identifier
sofie, 0x180, (384)

Description
Spacecraft ACS status update command.

Discussion
noop for SOFIE

Command Target

sofie software

Format

	opcode	subfield(s)													
	0xfe00	filler_2		seconds		subseconds		sc_to_sun_u_x		sc_to_sun_u_y		sc_to_sun_u_z		filler_3	
bit	0 15	16	79	80	111	112	143	144	207	208	271	272	335	336	447

Command size = 448 bits = 56 bytes.

Subfield(s)

filler_2: Filler data to match OSC command structure.

bits	type	eng units	min (dn)	max (dn)	state	value
64	fill	any	0	0	default	0

seconds: Seconds field of timestamp.

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer	any	0	4294967295	default	0

subseconds: Fractional part of timestamp.

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer	any	0	4294967295	default	0

sc_to_sun_u_x: Spacecraft to sun unit vector, spacecraft body frame, cartesian x coordinate.

bits	type	eng units	min (dn)	max (dn)	state	value
64	float	any	0	0	default	0

sc_to_sun_u_y: Spacecraft to sun unit vector, spacecraft body frame, cartesian y coordinate.

bits	type	eng units	min (dn)	max (dn)	state	value
64	float	any	0	0	default	0

sc_to_sun_u_z: Spacecraft to sun unit vector, spacecraft body frame, cartesian z coordinate.

bits	type	eng units	min (dn)	max (dn)	state	value
64	float	any	0	0	default	0

filler_3: Filler data to match OSC command structure.

bits	type	eng units	min (dn)	max (dn)	state	value
112	fill	any	0	0	default	0

Safety Level

SAFE

Telemetry Verification

B.33 inform sofie pwrdown

Packet Target Application Identifier

sofie, 0x180, (384)

Description

SOFIE powerdown warning

Command Target

software

Format

	opcode
	0xbb40

Command size = 16 bits = 2 bytes.

bit 0 15

Subfield(s)

Safety Level

SAFE

Telemetry Verification

B.34 inform sofie sc_clock

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Notify FSW of spacecraft time at next time sync.

Discussion

Notify FSW of the spacecraft clock time at the next sync mode code upon the 1553 bus.

Constraints

By itself, this command will not set the instrument propogated spacecraft clock. To set the clock, this command must be followed by a MIL-STD-1553 SYNC mode code within TBD seconds.

An incorrect value of spacecraft clock can seriously degrade instrument command sequencing and the resulting collection of science data.

Command Target

software

Format

	opcode	subfield(s)	
	0xfc00	seconds	subseconds

Command size = 80 bits = 10 bytes.

bit 0 15 16 47 48 79

Subfield(s)

seconds: Integral seconds portion of spacecraft clock.

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer	dn	0	4294967295	default	0

subseconds: Integral subseconds portion of spacecraft clock.

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer	dn	0	4294967295	default	0

subseconds discussion:

Each bit represents 2 to the -32 seconds.

Safety Level
SAFE

Telemetry Verification

B.35 issue sofie command

Packet Target Application Identifier
sofie, 0x180, (384)

Description
SOFIE command

Discussion
noop for SOFIE

Command Target
sofie software

Format

	opcode
	0x0000
bit	0 15

Command size = 16 bits = 2 bytes.

Subfield(s)

Safety Level
SAFE

Telemetry Verification

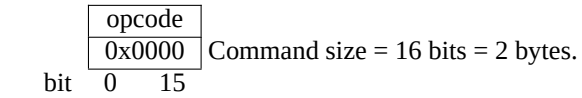
B.36 issue sofie reserved_1

Packet Target Application Identifier
sofie, 0x181, (385)

Description
SOFIE reserved command 1

Discussion
noop for SOFIE

Command Target
sofie software

Format


Subfield(s)

Safety Level
SAFE

Telemetry Verification

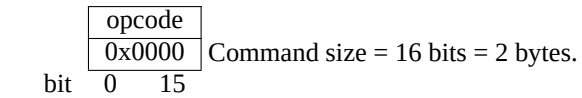
B.37 issue sofie reserved_2

Packet Target Application Identifier
sofie, 0x182, (386)

Description
SOFIE reserved command 2

Discussion
noop for SOFIE

Command Target
sofie software

Format


Subfield(s)

Safety Level
SAFE

Telemetry Verification

B.38 issue sofie reserved_3

Packet Target Application Identifier
sofie, 0x183, (387)

Description
SOFIE reserved command 3

Discussion
noop for SOFIE

Command Target
sofie software

Format

	opcode
	0x0000
bit	0 15

Command size = 16 bits = 2 bytes.

Subfield(s)

Safety Level
SAFE

Telemetry Verification

B.39 noop sofie

Packet Target Application Identifier
sofie, 0x180, (384)

Description
No operation, or do nothing command.

Discussion
noop for SOFIE

Command Target
sofie software

Format

	opcode
	0x0000
bit	0 15

Command size = 16 bits = 2 bytes.

Subfield(s)

Safety Level

SAFE

Telemetry Verification

B.40 pass sofie codeload1

Packet Target Application Identifier

sofie, 0x180, (384)

Description

SSB Transfer Code

Discussion

Transfer the SSB code image from CDH to SSB.

Constraints

This command is a SOFIE internal command and is not intended to be issued from the ground. It is used by the C&DH board to transfer a code image from EEPROM to the SSB board.

Command Target

sofie

Format

	opcode	subfield(s)			
	0xdd00	start_address	length	status	checksum

Command size = 80 bits = 10 bytes.

bit	0	15	16	31	32	47	48	63	64	79

Subfield(s)

start_address: Destination address of the code transfer.

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	any	0	65535	default	0

length: Length of code transfer in words.

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	any	0	65535	default	0

status: Status of completed code transfer.

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	any	0	65535	default	0

checksum: Checksum of code transfer.

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	any	0	65535	default	0

Safety Level

SAFE

Telemetry Verification

B.41 pass sofie codeload2

Packet Target Application Identifier

sofie, 0x182, (386)

Description

Reprogram EEPROM Image

Discussion

Code upload to reprogram the EEPROM image.

Constraints

Each packet is limited to 64 words of code image.

Valid OD address: min OD address = 0x8, max OD address = 0xF.

An invalid size or OD address will generate an error and the code will not be loaded.

Command Target

sofie

Format

	opcode	subfield(s)				
	0xbb01	OD_address	start_address	length	checksum	data
bit	0 15	16 31	32 47	48 63	64 95	96 1983

Command size = 1984 bits = 248 bytes.

Subfield(s)

OD_address: bank select OD bits for code upload

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

start_address: start address of the code upload destination

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

length: length of code upload

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

checksum: checksum of data to be loaded

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer	dn	0	4294967295	default	0

data: data to be loaded

bits	type	eng units	min (dn)	max (dn)	state	value
1888	fill	dn	0	65535	default	0

Safety Level

SAFE

Telemetry Verification

B.42 pass sofie codeload3

Packet Target Application Identifier

sofie, 0x182, (386)

Description

Reprogram C&DH SRAM Image

Discussion

Code upload to reprogram the C&DH SRAM image.

Constraints

Each packet is limited to 64 words of code image. Since code is written to instruction SRAM the value of the OD address does not matter. An invalid size will generate an error and the code will not be loaded

Command Target

sofie

Format

	opcode	subfield(s)				
	0xbb02	OD_address	start_address	length	checksum	data
bit	0 15	16 31	32 47	48 63	64 95	96 1983

Command size = 1984 bits = 248 bytes.

Subfield(s)

OD_address: bank select OD bits for code upload

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

start_address: start address of the code upload destination

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

length: length of code upload

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

checksum: checksum of data to be loaded

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer	dn	0	4294967295	default	0

data: data to be loaded

bits	type	eng units	min (dn)	max (dn)	state	value
1888	fill	dn	0	65535	default	0

Safety Level

SAFE

Telemetry Verification

B.43 pass sofie codeload4

Packet Target Application Identifier

sofie, 0x182, (386)

Description

Reprogram SS&SM SRAM Image

Discussion

Code upload to reprogram the SSB SRAM image.

Constraints

Each packet is limited to 64 words of code image.Since code is written to instruction SRAM the value of the OD address does not matter. An invalid size will generate an error and the code will not be loaded.

Command Target

sofie

Format

	opcode	subfield(s)				
	0xbb03	OD_address	start_address	length	checksum	data
bit	0 15	16 31	32 47	48 63	64 95	96 1983

Command size = 1984 bits = 248 bytes.

Subfield(s)

OD_address: bank select OD bits for code upload

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

start_address: start address of the code upload destination

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

length: length of code upload

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

checksum: checksum of data to be loaded

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer	dn	0	4294967295	default	0

data: data to be loaded

bits	type	eng units	min (dn)	max (dn)	state	value
1888	fill	dn	0	65535	default	0

Safety Level

SAFE

Telemetry Verification

B.44 pass sofie ss_aztable

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Upload Sun Sensor Azimuth Table

Discussion

Transmit the sun sensor azimuth table from the C&DH board to the sun sensor board. This opcode can be used in two distinct ways. Either as a direct real-time command or autonomously as part of the science event processor. Normally the sun sensor azimuth table should be transferrred by the science event processor as part of event processing. This ensures that the checksum for the event table (which includes the azimuth table) is checked before the azimuth table is transferred.

Constraints

This command enables the C&DH EEPROMs and then calls the blockCopyIO2S function to transmit a Sun Sensor AZ table from the C&DH EEPROM to the Sun Sensor Board. It then disables the C&DH EEPROMs. If this opcode is used as part of the normal event processing then the following errors may be generated: If the requested event command table number is outside of the allowable range (1 to 63) then an X4D_STATE_1_EVENT_TABLE_NUMBER_OUTSIDE_RANGE error is generated. The errant event table number is returned in the additional error information word. If the table cannot be read from EEPROM then an X4D_UNABLE_TO_READ_EVT_AZ_ENTRIES error will be generated. The status from the read_eeprom function is returned in the additional error information word. If the RS422 buffer (used to transmit the table to the sun sensor board) is full two retries will be used to send the azimuth table. If it can't be transmitted after three tries an X4D_UNABLE_TO_SEND_AZ_TABLE_Q_FULL error is generated with the table number returned in the additional error info. If some other comm. error occurs an X4D_UNABLE_TO_SEND_AZ_TABLE error is generated with the table number in the additional error info.

Command Target

sofie

Format

	opcode	subfield(s)			
	0xbb84	OD_address	start_address	length	data
bit	0 15	16 31	32 47	48 63	64 1983

Command size = 1984 bits = 248 bytes.

Subfield(s)

OD_address: bank select OD bits for memory address

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

start_address: the memory address

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

length: number of words in table

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

data: table data

bits	type	eng units	min (dn)	max (dn)	state	value
1920	fill				default	

Safety Level

SAFE

Telemetry Verification

B.45 pass sofie ss_eltable

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Upload Sun Sensor Elevation Table

Discussion

Transmit the sun sensor elevation table from the C&DH board to the sun sensor board. This opcode can be used in two distinct ways. Either as a direct real-time command or autonomously as part of the science event processor. Normally the sun sensor elevation table should be transferrred by the science event processor as part of event processing. This ensures that the checksum for the event table (which includes the elevation table) is checked before the elevation table is transferred.

Constraints

This command enables the C&DH EEPROMs and then calls the blockCopyIO2S function to transmit a Sun Sensor EL table from the C&DH EEPROM to the Sun Sensor Board. It then disables the C&DH EEPROMs. If this opcode is used as part of the normal event processing then the following errors may be generated: If the requested event command table number is outside of the allowable range (1 to 63) then an X4D_STATE_2_EVENT_TABLE_NUMBER_OUTSIDE_RANGE error is generated. The errant event table number is returned in the additional error information word. If the table cannot be read from EEPROM then an X4D_UNABLE_TO_READ_EVT_EL_ENTRIES error will be generated. The status from the read_eeprom function is returned in the additional error information word. If the RS422 buffer (used to transmit the table to the sun sensor board) is full two retries will be used to send the elevation table. If it can't be transmitted after three tries an X4D_UNABLE_TO_SEND_EL_TABLE_Q_FULL error is generated with the table number returned in the additional error info. If some other comm. error occurs an X4D_UNABLE_TO_SEND_EL_TABLE error is generated with the table number in the additional error info.

Command Target

sofie

Format

	opcode	subfield(s)			
	0xbb85	OD_address	start_address	length	data
bit	0 15	16 31	32 47	48 63	64 1983

Command size = 1984 bits = 248 bytes.

Subfield(s)

OD_address: bank select OD bits for memory address

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

start_address: the memory address

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

length: number of words in table

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

data: table data

bits	type	eng units	min (dn)	max (dn)	state	value
1920	fill				default	

Safety Level

SAFE

Telemetry Verification

B.46 pass sofie ssainit_tbl

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Pass Sun Sensor Tracking Algorithm Initialization Table

Discussion

Transmit table of initialization parameters from C&DH EEPROM to the SSB state & event table.M-J The primary table is found on EEPROM Bank 7 (starting at 0x80) and a backup table is kept on EEPROM Bank 8.M-J This table of parameters is used for initialization of the sun sensor tracking algorithm.M-J This table is sent automatically at system startup.M-J However, this command may be used to retransmit the table, as needed.

Command Target

sofie

Format

	opcode
	0xbb62

Command size = 16 bits = 2 bytes.

bit 0 15

Subfield(s)

Safety Level

SAFE

Telemetry Verification

B.47 perform sofie balance

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Balance strong and weak band detector signals

Discussion

detector_number values are 0-15 target_counts values are either 0=32764 detector counts or 0-4095 attenuator value balance_switch values are 0-5 0 = Apply target count value now, 1 = replace target count value in eeprom, 2 = apply and replace target count in eeprom, 3 = apply new attenuator value, 4 = replace attenuator value in eeprom, 5 = apply and replace attenuator value in eeprom.

Constraints

Valid Attenuator numbers are 1 - 16. Any other attenuator number will generate an Invalid Attenuator Number error and the command will be ignored. Valid execution options are 0 - 5. Any other execution option will generate a Invalid Parameter error and the command will be ignored. It is the operators responsibility to assure that the target counts or the attenuator value are correct.

Command Target

sofie

Format

opcode	subfield(s)			
0xbb86	detector_number	target_counts	balance_switch	event_type
bit 0 15	16 31	32 47	48 63	64 79

Command size = 80 bits = 10 bytes.

Subfield(s)

detector_number: Detector set to balance

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

target_counts: Balance target counts

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

balance_switch: Balance selection, 0 = Apply now, 1 = replace default, 2 = both

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

event_type: Event type 0=sunrise, 1=sunset

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

Safety Level

SAFE

Telemetry Verification

B.48 perform sofie balanceT

Packet Target Application Identifier

sofie, 0x181, (385)

Description

Balance strong and weak band detector signals (Timed execution)

Discussion

detector_number values are 0-15 target_counts values are either 0=32764 detector counts or 0-4095 attenuator value balance_switch values are 0-5

0 = Apply target count value now,

1 = replace target count value in eeprom,

2 = apply and replace target count in eeprom,

3 = apply new attenuator value,

4 = replace attenuator value in eeprom,

5 = apply and replace attenuator value in eeprom.

Command Target

sofie

Format

	opcode	subfield(s)					
	0xbb86	Time	detector_number	target_counts	balance_switch	event_type	Command size = 112
bit	0 15	16 47	48 63	64 79	80 95	96 111	

bits = 14 bytes.

Subfield(s)

Time: time of command execution

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer	dn	0	4294967295	default	0

detector_number: Detector set to balance

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

target_counts: Balance target counts

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

balance_switch: Balance selection, 0 = Apply now, 1 = replace default, 2 = both

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

event_type: Event type 0=sunrise, 1=sunset

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

Safety Level

SAFE

Telemetry Verification

B.49 release sofie cover_rl

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Fire Dust Cover Release

Discussion

Fires the aperture dust cover release mechanism. Valid parameters are:

1 = pinpuller 1A,

2 = pinpuller 1B,

3 = pinpuller 2A,

4 = pinpuller 2B

Constraints

Dust cover commands can only be executed in Safe Mode. If the C&DH is not in Safe Mode an Invalid Mode error will be generated and the command will be ignored. In order for the dust cover to be released it has to be armed. If the dust cover is not armed a Dust Cover Not Armed error message will be issued and the dust cover will not be released. If the dust cover is not released within 10 seconds of being armed, a dust cover timeout error message will be issued and the dust cover arm and release will be reset. If this timeout occurs the dust cover arm and release sequence will need to be restarted.

Command Target

sofie

Format

	opcode	subfield(s)
	0xbb45	pinpuller
bit	0 15	16 31

Command size = 32 bits = 4 bytes.

Subfield(s)

pinpuller: 0x01 = pin puller 1A, 0x02 = pin puller 1B, 0x03 = pin puller 2A, 0x04 = pin pul

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

Safety Level

SAFE

Telemetry Verification

B.50 reset sofie all

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Reset C&DH and Sun Sensoe Processors

Discussion

Returns the C&DH and SSB processors to their 'power on' condition. Performs a 'warm boot'.

Constraints

This command does the following:

1. Sends reset_ssb command to SSB board.

2. Writes a pattern to a FPGA register which places the C&DH in PROM mode.

The next instruction executed will then be the instruction at address 0 of the C&DH PROM.

Command Target

sofie

Format

opcode
0xbb42

Command size = 16 bits = 2 bytes.

bit 0 15

Subfield(s)

Safety Level

SAFE

Telemetry Verification

B.51 reset sofie cdh

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Reset C&DH Processor

Discussion

Returns the C&DH processor to its 'power on' condition. Performs a 'warm boot'.

Constraints

This command writes a pattern to a FPGA register which places the C&DH in PROM mode. The next instruction executed will then be the instruction at address 0 of the C&DH PROM

Command Target

sofie

Format

opcode
0xbb43

Command size = 16 bits = 2 bytes.

bit 0 15

Subfield(s)

Safety Level

SAFE

Telemetry Verification

B.52 reset sofie code_chksm

Packet Target Application Identifier

sofie, 0x180, (384)

Description

SSB Reset Transfer Code Checksum

Constraints

This command is a SOFIE internal command and is not intended to be issued from the ground. It is used by the C&DH board to reset a running checksum being calculated on the SSB board. The SSB board calculates and uses the running checksum to validate a code image transferred from the C&DH board.

Command Target

sofie

Format

	opcode
	0xdd01

Command size = 16 bits = 2 bytes.

bit 0 15

Subfield(s)

Safety Level

SAFE

Telemetry Verification

B.53 reset sofie cover_rls

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Reset Dust Cover Release

Discussion

Resets the aperture dust cover arming circuitry. This should be done after the cover is released. This should also be done if the cover is not released for some reason.

Constraints

Dust cover commands can only be executed in Safe Mode. If the C&DH is not in Safe Mode an Invalid Mode error will be generated and the command will be ignored. This command will reset the dust cover arm and release. After this command is issued the dust cover arm and release sequence will need to be restarted.

Command Target

sofie

Format

opcode
0xbb46

Command size = 16 bits = 2 bytes.

bit 0 15

Subfield(s)

Safety Level

SAFE

Telemetry Verification

B.54 reset sofie error_map

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Clear error map

Discussion

Clears all stored errors in C&DH error map. This command calls the csc04ClearCNDHErrorMap function to clear the C&DH error map.

Command Target

sofie

Format

opcode
0xbb87

Command size = 16 bits = 2 bytes.

bit 0 15

Subfield(s)

Safety Level

SAFE

Telemetry Verification

B.55 reset sofie error_mapT

Packet Target Application Identifier

sofie, 0x181, (385)

Description

Clear error map (Timed execution)

Command Target

sofie

Format

	opcode	subfield(s)
	0xbb87	Time

Command size = 48 bits = 6 bytes.

bit 0 15 16 47

Subfield(s)

Time: Time of command execution

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer				default	

Safety Level

SAFE

Telemetry Verification

B.56 reset sofie s30_timer

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Restart 30 second timer

Discussion

This command may be used to extend the time before the C&DH transmits the SSB code image to the SSB. Its intention is to provide additional time to upload new code images if desired.

Constraints

This command is used to reset the C&DH boot loader 30 sec. timer. It can only be executed while in the C&DH Boot Loader CSCI Polling Sequence. If it is executed in any other mode or sequence an invalid sequence error is returned.

Command Target

sofie

Format

	opcode
	0xbb00

Command size = 16 bits = 2 bytes.

bit 0 15

Subfield(s)

Safety Level
SAFE

Telemetry Verification

B.57 reset sofie ssb

Packet Target Application Identifier
sofie, 0x180, (384)

Description
Reset Sun Sensor and Steering Mirror Processor

Discussion
Returns the SSB processor to its 'power on' condition. Performs a 'warm boot'.

Constraints
This command writes a pattern to a FPGA register which places the SSB in PROM mode. The next instruction executed will then be the instruction at address 0 of the SSB PROM.

Command Target
sofie

Format

	opcode
	0xdd41

Command size = 16 bits = 2 bytes.

bit 0 15

Subfield(s)

Safety Level
SAFE

Telemetry Verification

B.58 reset sofie ssb_error

Packet Target Application Identifier
sofie, 0x180, (384)

Description
Clear SSB error map

Discussion

Clears all stored errors in SSB error map. This command calls the csc12ClearSSErrorMap function to clear the SSB error map.

Command Target

sofie

Format

	opcode
	0xdd8e

Command size = 16 bits = 2 bytes.

bit 0 15

Subfield(s)

Safety Level

SAFE

Telemetry Verification

B.59 reset sofie ssb_errorT

Packet Target Application Identifier

sofie, 0x181, (385)

Description

Clear SSB error map

Command Target

sofie

Format

	opcode	subfield(s)
	0xdd8e	Time

Command size = 48 bits = 6 bytes.

bit 0 15 16 47

Subfield(s)

Time: Time of command execution

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer				default	

Safety Level

SAFE

Telemetry Verification

B.60 reset sofie ssb_timer

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Reset SSB Relative Timer

Discussion

This command sets a bit in the FPGA so that the relative timer is reset on the next 20 Hz pulse.

Command Target

sofie

Format

	opcode
	0xdd45
bit	0 15

Command size = 16 bits = 2 bytes.

Subfield(s)

Safety Level

SAFE

Telemetry Verification

B.61 reset sofie ssg

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Reset SSG hardware to power-on state

Discussion

Returns SSG hardware to its initialized power-on state. All flas and registers, including the gain registers, are returned to their default values. The servo loop is opened, deactivating the servos.

Command Target

sofie

Format

	opcode
	0xcc03
bit	0 15

Command size = 16 bits = 2 bytes.

Subfield(s)

Safety Level
SAFE

Telemetry Verification

B.62 reset sofie ssgT

Packet Target Application Identifier
sofie, 0x181, (385)

Description
Reset SSG hardware to power-on state (Timed Execution)

Discussion
See reset_ssg.

Command Target
sofie

Format

	opcode	subfield(s)
	0xcc03	Time

Command size = 48 bits = 6 bytes.

bit 0 15 16 47

Subfield(s)
Time: Time of command execution

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer				default	

Safety Level
SAFE

Telemetry Verification

B.63 reset sofie tc_entry

Packet Target Application Identifier
sofie, 0x180, (384)

Description
Delete a Timed Command Entry by Opcode

Discussion

Remove a selected Timed Command entry from the timed command table (based on absolute time in whole seconds and opcode). If the requested deletion is successful, the delete timed command entry opcode, absolute command time (in whole seconds) and requested command opcode are returned in the free format section of the system data packet.

Constraints

If the requested command cannot be found, for deletion, an X4C_COMMAND_REQUESTED_FOR_DELETION_NOT_FOUND (0x4C01) error is generated with the opcode of the requested command as the data word.

Command Target

sofie

Format

	opcode	subfield(s)		
	0xbb4b	time	Opcode	Command size = 64 bits = 8 bytes.
bit	0 15	16 47	48 63	

Subfield(s)

time: Time of the command to delete

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer				default	

Opcode: Opcode of the command to delete

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

Safety Level

SAFE

Telemetry Verification

B.64 reset sofie tc_range

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Delete a Timed Command Entrys by Time Range

Discussion

Remove all timed commands over a range of absolute times. This command is used to support the science event processor. The return status from this command is provided in the free format area of the system data packet. The returned opcode is the same as the command opcode. However, the number of deleted commands is appended after the absolute start and stop times.

Constraints

It is up to ground operations to ensure that the requested start and end times are valid.

Command Target

sofie

Format

	opcode	subfield(s)		
	0xbb4c	start_time	end_time	Command size = 80 bits = 10 bytes.
bit	0 15	16 47	48 79	

Subfield(s)

start_time: Start time of the time range for commands to delete

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer				default	

end_time: End time of the time range for commands to delete

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer				default	

Safety Level

SAFE

Telemetry Verification

B.65 reset sofie tc_table

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Reset (Flush) the Timed Command Table

Discussion

Resets the in-use entries of the timed command table and resets the number of entries in use to zero.

Command Target

sofie

Format

	opcode	
	0xbb4a	Command size = 16 bits = 2 bytes.
bit	0 15	

Subfield(s)

Safety Level

SAFE

Telemetry Verification

B.66 safe sofie

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Place the sofie instrument in a safe state.

Discussion

Any current sofie instrument activity is halted, and the instrument is configured to a safe state via the default instrument shut down sequence. The sofie instrument may be left in the safe configuration indefinitely.

Constraints

None. This command can be received at any time.

Command Target

sofie software

Format

	opcode
	0xfd00
bit	0 15

Command size = 16 bits = 2 bytes.

Subfield(s)

Safety Level

SAFE

Telemetry Verification

sofie mode (**??**)

Related Commands

command	*description*
wake sofie (149)	Remove sofie safing constraints, allowing transition out of safe hold.

B.67 select sofie safe

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Transition to Safe Mode

Discussion

This command immediately places the C&DH board in Safe Mode.

Command Target

sofie

Format

opcode
0xbb48

Command size = 16 bits = 2 bytes.

bit 0 15

Subfield(s)

Safety Level

SAFE

Telemetry Verification

B.68 select sofie science

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Transition to Science Mode

Constraints

The C&DH board can not transition from Safe Mode to Science Mode. If the C&DH board is in Safe mode an Invalid Mode error will be generated and the command will be ignored. If the C&DH is not in Safe Mode this command immediately places the C&DH board in Science Mode.

Command Target

sofie

Format

opcode
0xbb49

Command size = 16 bits = 2 bytes.

bit 0 15

Subfield(s)

Safety Level

SAFE

Telemetry Verification

B.69 select sofie science_S

Packet Target Application Identifier
sofie, 0x180, (384)

Description
SSB Transition to Science mode

Discussion
This command immediately places the SSB board in Science Mode

Command Target
sofie

Format

	opcode
	0xdd47

Command size = 16 bits = 2 bytes.

bit 0 15

Subfield(s)

Safety Level
SAFE

Telemetry Verification

B.70 select sofie ssb_quiet

Packet Target Application Identifier
sofie, 0x180, (384)

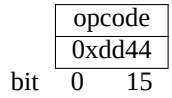
Description
SSB Quiet Mode

Discussion
This command is used to synchronize the C&DH and SSB Free Running Timers. It places the SSB into a high speed polling mode which empties the SSB command queues and allows the SSB to respond as quickly as possible to a time synchronization message.

Constraints
This command is a SOFIE internal command and is not intended to be issued from the ground.

Command Target
sofie

Format



Command size = 16 bits = 2 bytes.

Subfield(s)

Safety Level

SAFE

Telemetry Verification

B.71 select sofie standby

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Transition to Standby Mode

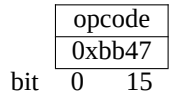
Discussion

This command immediately places the C&DH board in Standby Mode.

Command Target

sofie

Format



Command size = 16 bits = 2 bytes.

Subfield(s)

Safety Level

SAFE

Telemetry Verification

B.72 select sofie standby_S

Packet Target Application Identifier

sofie, 0x180, (384)

Description

SSB Transition to Standby mode

Discussion

This command immediately places the SSB board in Standby Mode

Command Target

sofie

Format

	opcode
	0xdd46

Command size = 16 bits = 2 bytes.

bit 0 15

Subfield(s)

Safety Level

SAFE

Telemetry Verification

B.73 set sofie autrep_rate

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Set Automation Reporting Rate

Constraints

This command is a remnant from the descoped autonomy functions. It remains as a placeholder should the autonomy functions be added in the future.

Command Target

sofie

Format

	opcode	subfield(s)
	0xbb2b	autom_rept_rate

Command size = 32 bits = 4 bytes.

bit 0 15 16 31

Subfield(s)

autom_rept_rate: automation reporting rate

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

Safety Level

SAFE

Telemetry Verification

B.74 set sofie autrep_rateT

Packet Target Application Identifier

sofie, 0x181, (385)

Description

Set Automation Reporting Rate (Timed execution)

Constraints

This command is a remnant from the descoped autonomy functions. It remains as a placeholder should the autonomy functions be added in the future.

Command Target

sofie

Format

	opcode	subfield(s)	
	0xbb2b	Time	autom_rept_rate

Command size = 64 bits = 8 bytes.

bit	0	15	16	47	48	63

Subfield(s)

Time: time of command execution

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer	dn	0	4294967295	default	0

autom_rept_rate: automation reporting rate

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

Safety Level

SAFE

Telemetry Verification

B.75 set sofie bore_freq

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Set Frequency of Boresight Calibrations

Constraints

This command is a remnant from the descoped autonomy functions. It remains as a placeholder should the autonomy functions be added in the future.

Command Target

sofie

Format

	opcode	subfield(s)
	0xbb27	boresight_freq

Command size = 32 bits = 4 bytes.

bit	0	15	16	31

Subfield(s)

boresight_freq: frequency of boresight calibrations

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

Safety Level

SAFE

Telemetry Verification

B.76 set sofie bore_freqT

Packet Target Application Identifier

sofie, 0x181, (385)

Description

Set Frequency of Boresight Calibrations (Timed execution)

Constraints

This command is a remnant from the descoped autonomy functions. It remains as a placeholder should the autonomy functions be added in the future.

Command Target

sofie

Format

	opcode	subfield(s)	
	0xbb27	Time	boresight_freq

Command size = 64 bits = 8 bytes.

bit	0	15	16	47	48	63

Subfield(s)

Time: time of command execution

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer	dn	0	4294967295	default	0

boresight_freq: frequency of boresight calibrations

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

Safety Level

SAFE

Telemetry Verification

B.77 set sofie bore_table

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Set Default Boresight Calibration Table

Constraints

This command is a remnant from the descoped autonomy functions. It remains as a placeholder should the autonomy functions be added in the future.

Command Target

sofie

Format

	opcode	subfield(s)	
	0xbb25	OD_address	Address
bit	0 15	16 31	32 47

Command size = 48 bits = 6 bytes.

Subfield(s)

OD_address: bank select OD bits for memory address

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

Address: the memory address

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

Safety Level

SAFE

Telemetry Verification

B.78 set sofie bore_tableT

Packet Target Application Identifier

sofie, 0x181, (385)

Description

Set Default Boresight Calibration Table (Timed execution)

Constraints

This command is a remnant from the descoped autonomy functions. It remains as a placeholder should the autonomy functions be added in the future.

Command Target

sofie

Format

	opcode	subfield(s)		
	0xbb25	Time	OD_address	Address

Command size = 80 bits = 10 bytes.

bit	0	15	16	47	48	63	64	79

Subfield(s)

Time: time of command execution

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer	dn	0	4294967295	default	0

OD_address: bank select OD bits for memory address

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

Address: the memory address

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

Safety Level

SAFE

Telemetry Verification

B.79 set sofie cdh_echo

Packet Target Application Identifier

sofie, 0x180, (384)

Description

C&DH Processor Echo

Discussion

Echos the command opcode to the system data packet. The command is echoed by writing the command to the C&DH Message Queue

Command Target

sofie

Format

	opcode
	0xbb80

Command size = 16 bits = 2 bytes.

bit 0 15

Subfield(s)

Safety Level

SAFE

Telemetry Verification

B.80 set sofie cdh_echoT

Packet Target Application Identifier

sofie, 0x181, (385)

Description

C&DH Processor Echo (Timed execution)

Discussion

Echos the command opcode to the system data packet. The command is echoed by writing the command to the C&DH Message Queue

Command Target

sofie

Format

	opcode	subfield(s)
	0xbb80	Time

Command size = 48 bits = 6 bytes.

bit 0 15 16 47

Subfield(s)

Time: time of command execution

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer	dn	0	4294967295	default	0

Safety Level

SAFE

Telemetry Verification

B.81 set sofie cdh_reg

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Set C&DH FPGA Register Value

Discussion

Loads a selected C&DH FPGA register.

Constraints

Valid OD_address parameters are:

4 = ARP FPGA,

6 = DAQ FPGA.

Any other value will result in an invalid FPGA bank error. Allows operator to select any register address and register value. It is the operators responsibility to assure valid values are selected.

Command Target

sofie

Format

	opcode	subfield(s)			
	0xbb83	OD_address	address	value	Command size = 64 bits = 8 bytes.
bit	0 15	16 31	32 47	48 63	

Subfield(s)

OD_address: bank select OD bits for register address.

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	any	0	65535	default	0

address: the register address.

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	any	0	65535	default	0

value: the value to place in the register.

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	any	0	65535	default	0

Safety Level

SAFE

Telemetry Verification

B.82 set sofie cdh_regT

Packet Target Application Identifier

sofie, 0x181, (385)

Description

Set C&DH FPGA Register Value (Timed execution)

Discussion

Loads a selected C&DH FPGA register.

Command Target

sofie

Format

	opcode	subfield(s)								
	0xbb83	Time		OD_address		address		value		Command size = 96 bits = 12 bytes.
bit	0 15	16	47	48	63	64	79	80	95	

Subfield(s)

Time: time of command execution

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer	dn	0	4294967295	default	0

OD_address: bank select OD bits for register address

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

address: the register address

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

value: the value

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

Safety Level

SAFE

Telemetry Verification

B.83 set sofie cdh_sram

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Set value in C&DH data SRAM

Discussion

Loads selected C&DH data SRAM address.

Constraints

This command writes a one word data value to the requested C&DH data SRAM address. It is the operators responsibility to assure that the data address and data value are correct.

Command Target

sofie

Format

	opcode	subfield(s)		
	0xbb89	address	value	Command size = 48 bits = 6 bytes.
bit	0 15	16 31	32 47	

Subfield(s)

address: Address of data word to set

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

value: Value

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

Safety Level

SAFE

Telemetry Verification

B.84 set sofie cdh_sramT

Packet Target Application Identifier

sofie, 0x181, (385)

Description

Set value in C&DH data SRAM

Discussion

Loads selected C&DH data SRAM address.

Command Target

sofie

Format

	opcode	subfield(s)					
	0xbb89	time		address		value	
bit	0 15	16	47	48	63	64	79

Command size = 80 bits = 10 bytes.

Subfield(s)

time: Time of command execution

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer				default	

address: Address of data word to set

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

value: Value

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

Safety Level

SAFE

Telemetry Verification

B.85 set sofie endata_rate

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Set Engineering Data Transmission Rate

Discussion

Sets the rate (in seconds) at which engineering data is transmitted.

Command Target

sofie

Format

	opcode	subfield(s)
	0xbb29	eng_data_rate
bit	0 15	16 31

Command size = 32 bits = 4 bytes.

Subfield(s)

eng_data_rate: engineering data transmission rate

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

Safety Level

SAFE

Telemetry Verification

B.86 set sofie endata_rateT

Packet Target Application Identifier

sofie, 0x181, (385)

Description

Set Engineering Data Transmission Rate (Timed execution)

Discussion

Sets the rate (in seconds) at which engineering data is transmitted.

Command Target

sofie

Format

	opcode	subfield(s)	
	0xbb29	Time	eng_data_rate

Command size = 64 bits = 8 bytes.

bit	0	15	16	47	48	63

Subfield(s)

Time: time of command execution

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer	dn	0	4294967295	default	0

eng_data_rate: engineering data transmission rate

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

Safety Level

SAFE

Telemetry Verification

B.87 set sofie event_pred

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Activate/Deactivate Science Event Prediction

Constraints

This command is a remnant from the descoped autonomy functions. It remains as a placeholder should the autonomy functions be added in the future.

Command Target

sofie

Format

	opcode	subfield(s)
	0xbb2c	predict_switch

Command size = 32 bits = 4 bytes.

bit 0 15 16 31

Subfield(s)

predict_switch: Boolean enable or disable science event prediction

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

Safety Level

SAFE

Telemetry Verification

B.88 set sofie event_predT

Packet Target Application Identifier

sofie, 0x181, (385)

Description

Activate/Deactivate Science Event Prediction (Timed execution)

Constraints

This command is a remnant from the descoped autonomy functions. It remains as a placeholder should the autonomy functions be added in the future.

Command Target

sofie

Format

	opcode	subfield(s)	
	0xbb2c	Time	predict_switch
bit	0 15	16 47	48 63

Command size = 64 bits = 8 bytes.

Subfield(s)

Time: time of command execution

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer	dn	0	4294967295	default	0

predict_switch: Boolean enable or disable science event prediction

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

Safety Level

SAFE

Telemetry Verification

B.89 set sofie faultovercd

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Set On-Board Fault Response Override for C&DH

Constraints

Valid parameters 0 = reset, 1 = set.

Any other value will result in an invalid fault response override parameter error.

Command Target

sofie

Format

	opcode	subfield(s)
	0xbb2e	CDH_fault_over
bit	0 15	16 31

Command size = 32 bits = 4 bytes.

Subfield(s)

CDH_fault_over: Boolean set on-board fault response overide for C&DH

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

Safety Level

SAFE

Telemetry Verification

B.90 set sofie faultovercdT

Packet Target Application Identifier

sofie, 0x181, (385)

Description

Set On-Board Fault Response Override for C&DH (Timed execution)

Constraints

Valid parameters 0 = reset, 1 = set.

Any other value will result in an invalid fault response override parameter error.

Command Target

sofie

Format

	opcode	subfield(s)				
	0xbb2e	Time		CDH_fault_over		Command size = 64 bits = 8 bytes.
bit	0 15	16	47	48	63	

Subfield(s)

Time: time of command execution

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer	dn	0	4294967295	default	0

CDH_fault_over: Boolean set on-board fault response overide for C&DH

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

Safety Level

SAFE

Telemetry Verification

B.91 set sofie faultoverss

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Set On-Board Fault Response Override for SS&SM

Constraints

Valid parameters 0 = reset, 1 = set.

Any other value will result in an invalid fault response override parameter error.

Command Target

sofie

Format

	opcode	subfield(s)
	0xdd20	SSM_fault_over

Command size = 32 bits = 4 bytes.

bit 0 15 16 31

Subfield(s)

SSM_fault_over: Boolean set on-board fault response overide for SS&SM

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

Safety Level

SAFE

Telemetry Verification

B.92 set sofie faultoverssT

Packet Target Application Identifier

sofie, 0x181, (385)

Description

Set On-Board Fault Response Override for SS&SM (Timed execution)

Constraints

Valid parameters 0 = reset, 1 = set.

Any other value will result in an invalid fault response override parameter error.

Command Target

sofie

Format

	opcode	subfield(s)	
	0xdd20	Time	SSM_fault_over

Command size = 64 bits = 8 bytes.

bit 0 15 16 47 48 63

Subfield(s)

Time: time of command execution

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer	dn	0	4294967295	default	0

SSM_fault_over: Boolean set on-board fault response overide for SS&SM

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

Safety Level

SAFE

Telemetry Verification

B.93 set sofie gain_freq

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Set Frequency of Gain Calibrations

Constraints

This command is a remnant from the descoped autonomy functions. It remains as a placeholder should the autonomy functions be added in the future.

Command Target

sofie

Format

	opcode	subfield(s)
	0xbb28	gain_freq
bit	0 15	16 31

Command size = 32 bits = 4 bytes.

Subfield(s)

gain_freq: frequency of gain calibrations

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

Safety Level

SAFE

Telemetry Verification

B.94 set sofie gain_freqT

Packet Target Application Identifier

sofie, 0x181, (385)

Description

Set Frequency of Gain Calibrations (Timed execution)

Constraints

This command is a remnant from the descoped autonomy functions. It remains as a placeholder should the autonomy functions be added in the future.

Command Target

sofie

Format

	opcode	subfield(s)	
	0xbb28	Time	gain_freq
bit	0 15	16 47	48 63

Command size = 64 bits = 8 bytes.

Subfield(s)

Time: time of command execution

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer	dn	0	4294967295	default	0

gain_freq: frequency of gain calibrations

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

Safety Level

SAFE

Telemetry Verification

B.95 set sofie gain_table

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Set Default Gain Calibration Table

Constraints

This command is a remnant from the descoped autonomy functions. It remains as a placeholder should the autonomy functions be added in the future.

Command Target

sofie

Format

	opcode	subfield(s)	
	0xbb26	OD_address	Address
bit	0 15	16 31	32 47

Command size = 48 bits = 6 bytes.

Subfield(s)

OD_address: bank select OD bits for memory address

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

Address: the memory address

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

Safety Level

SAFE

Telemetry Verification

B.96 set sofie gain_tableT

Packet Target Application Identifier

sofie, 0x181, (385)

Description

Set Default Gain Calibration Table (Timed execution)

Constraints

This command is a remnant from the descoped autonomy functions. It remains as a placeholder should the autonomy functions be added in the future.

Command Target

sofie

Format

	opcode	subfield(s)		
	0xbb26	Time	OD_address	Address
bit	0 15	16 47	48 63	64 79

Command size = 80 bits = 10 bytes.

Subfield(s)

Time: time of command execution

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer	dn	0	4294967295	default	0

OD_address: bank select OD bits for memory address

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

Address: the memory address

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

Safety Level

SAFE

Telemetry Verification

B.97 set sofie m1553_chksm

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Set 1553 Checksum Verification

Discussion

Turn on or off the 1553 checksum verification.

Constraints

Valid parameters are 0 = reset, 1 = set.

Any other value will result in an invalid set 1553 checksum parameter error.

Command Target

sofie

Format

	opcode	subfield(s)
	0xbb20	checksum_switch

Command size = 32 bits = 4 bytes.

bit	0	15	16	31

Subfield(s)

checksum_switch: Boolean enable or disable checksum verification

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

Safety Level

SAFE

Telemetry Verification

B.98 set sofie m1553_chksmT

Packet Target Application Identifier

sofie, 0x181, (385)

Description

Set 1553 Checksum Verification (Timed execution)

Discussion

Turn on or off the 1553 checksum verification.

Constraints

Valid parameters are 0 = reset, 1 = set.

Any other value will result in an invalid set 1553 checksum parameter error.

Command Target

sofie

Format

	opcode	subfield(s)	
	0xbb20	Time	checksum_switch

Command size = 64 bits = 8 bytes.

bit	0	15	16	47	48	63

Subfield(s)

Time: time of command execution

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer	dn	0	4294967295	default	0

checksum_switch: Boolean enable or disable checksum verification

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

Safety Level

SAFE

Telemetry Verification

B.99 set sofie mcurr_limit

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Set Steering Mirror Current Limit

Constraints

This command writes the mirror current limit to the C&DH State and Event Shared Memory Table. Note: it does NOT set any SSG board values.

Command Target

sofie

Format

	opcode	subfield(s)
	0xbb2d	mirr_curr_limit

Command size = 32 bits = 4 bytes.

bit 0 15 16 31

Subfield(s)

mirr_curr_limit: steering mirror current limit

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

Safety Level

SAFE

Telemetry Verification

B.100 set sofie mcurr_limitT

Packet Target Application Identifier

sofie, 0x181, (385)

Description

Set Steering Mirror Current Limit (Timed execution)

Constraints

This command writes the mirror current limit to the C&DH State and Event Shared Memory Table. Note: it does NOT set any SSG board values.

Command Target

sofie

Format

	opcode	subfield(s)	
	0xbb2d	Time	mirr_curr_limit

Command size = 64 bits = 8 bytes.

bit 0 15 16 47 48 63

Subfield(s)

Time: time of command execution

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer	dn	0	4294967295	default	0

mirr_curr_limit: steering mirror current limit

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

Safety Level

SAFE

Telemetry Verification

B.101 set sofie orb_period

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Set Orbit Period

Constraints

This command is a remnant from the descoped autonomy functions. It remains as a placeholder should the autonomy functions be added in the future.

Command Target

sofie

Format

	opcode	subfield(s)
	0xbb23	orbitTime

Command size = 48 bits = 6 bytes.

bit 0 15 16 47

Subfield(s)

orbitTime: time of orbit period

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer	dn	0	4294967295	default	0

Safety Level

SAFE

Telemetry Verification

B.102 set sofie orb_periodT

Packet Target Application Identifier

sofie, 0x181, (385)

Description

Set Orbit Period (Timed execution)

Constraints

This command is a remnant from the descoped autonomy functions. It remains as a placeholder should the autonomy functions be added in the future.

Command Target

sofie

Format

	opcode	subfield(s)	
	0xbb23	Time	orbitTime
bit	0 15	16 47	48 79

Command size = 80 bits = 10 bytes.

Subfield(s)

Time: time of command execution

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer	dn	0	4294967295	default	0

orbitTime: time of orbit period

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer	dn	0	4294967295	default	0

Safety Level

SAFE

Telemetry Verification

B.103 set sofie pix_tm

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Pixel telemetry mode.

Command Target

software

Format

	opcode	subfield(s)
	0xdd88	mode
bit	0 15	16 31

Command size = 32 bits = 4 bytes.

Subfield(s)

mode: Pixel telemetry mode, 0=sums, 1=pixels

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

Safety Level

SAFE

Telemetry Verification

B.104 set sofie plelem

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Pointing low elevation edge mode.

Command Target

software

Format

	opcode	subfield(s)
	0xdd87	low_edge

Command size = 32 bits = 4 bytes.

bit 0 15 16 31

Subfield(s)

low_edge: Edge mode, 0 =high elevation edge, 1=low elevation edge

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

Safety Level

SAFE

Telemetry Verification

B.105 set sofie sci_evt_tbl

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Setup Science Event Table

Discussion

Initialize the science event table with 256 event entries. The first event number in the table is determined by the supplied parameter. Upon completion of this command, the command opcode and start event number are returned in the free format section of the system data packet.

Constraints

This command calls the csc07SEPSetupScienceEventTable function with the operator supplied event number. If this command is not used before the first set_sunset_event or set_sunris_event command then the table is initialized using the event number from the set_sunset_event or set_sunris_event command. The start event number is any unsigned sixteen bit integer.

Command Target

sofie

Format

	opcode	subfield(s)
	0xbb2f	event_number

Command size = 32 bits = 4 bytes.

bit 0 15 16 31

Subfield(s)

event_number: Event number

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

Safety Level

SAFE

Telemetry Verification

B.106 set sofie sci_table

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Set Default Science Table

Constraints

This command is a remnant from the descoped autonomy functions. It remains as a placeholder should the autonomy functions be added in the future.

Command Target

sofie

Format

	opcode	subfield(s)	
	0xbb24	OD_address	Address
bit	0 15	16 31	32 47

Command size = 48 bits = 6 bytes.

Subfield(s)

OD_address: bank select OD bits for memory address

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

Address: the memory address

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

Safety Level

SAFE

Telemetry Verification

B.107 set sofie sci_tableT

Packet Target Application Identifier

sofie, 0x181, (385)

Description

Set Default Science Table (Timed execution)

Constraints

This command is a remnant from the descoped autonomy functions. It remains as a placeholder should the autonomy functions be added in the future.

Command Target

sofie

Format

	opcode	subfield(s)		
	0xbb24	Time	OD_address	Address
bit	0 15	16 47	48 63	64 79

Command size = 80 bits = 10 bytes.

Subfield(s)

Time: time of command execution

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer	dn	0	4294967295	default	0

OD_address: bank select OD bits for memory address

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

Address: the memory address

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

Safety Level

SAFE

Telemetry Verification

B.108 set sofie ssb_echo

Packet Target Application Identifier

sofie, 0x180, (384)

Description

SSB Processor Echo

Discussion

Echos the command opcode to the system data packet. The command is echoed by writing the command to the SSB Data Queue

Command Target

sofie

Format

opcode
0xdd80

Command size = 16 bits = 2 bytes.

bit 0 15

Subfield(s)

Safety Level

SAFE

Telemetry Verification

B.109 set sofie ssb_echoT

Packet Target Application Identifier

sofie, 0x181, (385)

Description

SSB Processor Echo (Timed execution)

Discussion

Echos the command opcode to the system data packet. The command is echoed by writing the command to the SSB Data Queue

Command Target

sofie

Format

	opcode	subfield(s)
	0xdd80	Time

Command size = 48 bits = 6 bytes.

bit 0 15 16 47

Subfield(s)

Time: time of command execution

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer	dn	0	4294967295	default	0

Safety Level

SAFE

Telemetry Verification

B.110 set sofie ssb_reg

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Set SSB FPGA Register Value

Discussion

Loads a selected SSB FPGA register.

Constraints

Valid OD_address parameter is 4 = FPGA.

Any other value will result in an invalid FPGA bank error. Allows operator to select any register address and register value. It is the operators responsibility to assure valid values are selected.

Command Target

sofie

Format

	opcode	subfield(s)		
	0xdd82	OD_address	address	value

Command size = 64 bits = 8 bytes.

bit 0 15 16 31 32 47 48 63

Subfield(s)

OD_address: bank select OD bits for register address.

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	any	0	65535	default	0

address: the register address.

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	any	0	65535	default	0

value: the value to place in the register.

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	any	0	65535	default	0

Safety Level

SAFE

Telemetry Verification

B.111 set sofie ssb_regT

Packet Target Application Identifier

sofie, 0x181, (385)

Description

Set SSB FPGA Register Value (Timed execution)

Discussion

Loads a selected SSB FPGA register.

Command Target

sofie

Format

	opcode	subfield(s)			
	0xdd82	Time	OD_address	address	value

Command size = 96 bits = 12 bytes.

bit	0	15	16	47	48	63	64	79	80	95

Subfield(s)

Time: time of command execution

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer	dn	0	4294967295	default	0

OD_address: bank select OD bits for register address

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

address: the register address

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

value: the value

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

Safety Level

SAFE

Telemetry Verification

B.112 set sofie ssb_sram

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Set value in SSB data SRAM

Discussion

Loads selected SSB data SRAM address.

Constraints

This command writes a one word data value to the requested SSB data SRAM address. It is the operators responsibility to assure that the data address and data value are correct.

Command Target

sofie

Format

	opcode	subfield(s)		
	0xdd8f	address	value	Command size = 48 bits = 6 bytes.
bit	0 15	16 31	32 47	

Subfield(s)

address: Address of data word to set

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

value: Value

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

Safety Level

SAFE

Telemetry Verification

B.113 set sofie ssb_sramT

Packet Target Application Identifier

sofie, 0x181, (385)

Description

Set value in SSB data SRAM

Discussion

Loads selected SSB data SRAM address.

Command Target

sofie

Format

	opcode	subfield(s)							
	0xdd8f	time		address		value		Command size = 80 bits = 10 bytes.	
bit	0	15	16	47	48	63	64	79	

Subfield(s)

time: Time of command execution

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer				default	

address: Address of data word to set

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

value: Value

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

Safety Level

SAFE

Telemetry Verification

B.114 set sofie ssbp_echo

Packet Target Application Identifier

sofie, 0x180, (384)

Description

SSB Processor Priority Echo

Discussion

Echos the command opcode to the system data packet. The command is echoed by writing the command to the SSB High Priority Reply Queue

Command Target

sofie

Format

	opcode
	0xdd81
bit	0 15

Command size = 16 bits = 2 bytes.

Subfield(s)

Safety Level

SAFE

Telemetry Verification

B.115 set sofie ssbp_echoT

Packet Target Application Identifier

sofie, 0x181, (385)

Description

SSB Priority Processor Echo (Timed execution)

Discussion

Echos the command opcode to the system data packet. The command is echoed by writing the command to the SSB High Priority Reply Queue

Command Target

sofie

Format

	opcode	subfield(s)	
	0xdd81	Time	
bit	0 15	16	47

Command size = 48 bits = 6 bytes.

Subfield(s)

Time: time of command execution

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer	dn	0	4294967295	default	0

Safety Level

SAFE

Telemetry Verification

B.116 set sofie ssg_PIDreg

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Load SSG PID registers

Discussion

This command sets the PID registers to the values transmitted. The SSG hardware responds by generating a message that contains all 8 PID register values, as they were written.

Command Target

sofie

Format

opcode	subfield(s)							
0xcc21	PID_azP	PID_azI	PID_azD	PID_azFF	PID_elP	PID_elI	PID_elD	PID_elFF
bit 0 15	16 31	32 47	48 63	64 79	80 95	96 111	112 127	128 143

Command size = 144 bits = 18 bytes.

Subfield(s)

PID_azP: Azimuth proportional gain value

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

PID_azI: Azimuth integral gain value

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

PID_azD: Azimuth derivative gain value

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

PID_azFF: Azimuth feed forward gain value

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

PID_elP: Elevation proportional gain value

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

PID_elI: Elevation integral gain value

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

PID_elD: Elevation derivative gain value

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

PID_elFF: Elevation feed forward gain value

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

Safety Level

SAFE

Telemetry Verification

B.117 set sofie ssg_az_el

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Position SSG mirror

Discussion

This commands the mirror to a position relative to its home position. Parameter 'flag' indicates if 'azimuth' or 'elevation' or both are to be changed.

Constraints

Valid parameters are:

0x0000 = change neither.

0x0001 = change elevation only.

0x0100 = change azimuth only.

0x0101 change azimuth and elevation.

Command Target

sofie

Format

	opcode	subfield(s)		
	0xcc20	position_flag	azimuth	elevation
bit	0 15	16 31	32 47	48 63

Command size = 64 bits = 8 bytes.

Subfield(s)

position_flag: 0x0000-Change neither, 0x0001-Change elevation only, 0x0100-Change azimuth only,

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

azimuth: Azimuth

bits	type	eng units	min (dn)	max (dn)	state	value
16	signed integer				default	

elevation: Elevation

bits	type	eng units	min (dn)	max (dn)	state	value
16	signed integer				default	

Safety Level

SAFE

Telemetry Verification

B.118 set sofie ssg_az_elT

Packet Target Application Identifier

sofie, 0x181, (385)

Description

Position SSG mirror (Timed Execution)

Discussion

See set_ssg_az_el.

Command Target

sofie

Format

	opcode	subfield(s)			
	0xcc20	Time	position_flag	azimuth	elevation
bit	0 15	16 47	48 63	64 79	80 95

Command size = 96 bits = 12 bytes.

Subfield(s)

Time: Time of command execution

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer				default	

position_flag: 0x0000-Change neither, 0x0001-Change elevation only, 0x0100-Change azimuth only,

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

azimuth: Azimuth

bits	type	eng units	min (dn)	max (dn)	state	value
16	signed integer				default	

elevation: Elevation

bits	type	eng units	min (dn)	max (dn)	state	value
16	signed integer				default	

Safety Level

SAFE

Telemetry Verification

B.119 set sofie ssg_echo1

Packet Target Application Identifier

sofie, 0x180, (384)

Description

SSG Echo one word

Discussion

This command is used to test the communication link. Upon receipt of the Echo command, SSG hardware responds with an identical packet. Only the response opcode and checksum will be different. The maximum number of data words is 1.

Constraints

Allowable parameter values are:

1 = echo one word,

2 = echo two words,

3 = echo three words.

Command Target

sofie

Format

	opcode	subfield(s)
	0xcc00	data1

Command size = 32 bits = 4 bytes.

bit 0 15 16 31

Subfield(s)

data1: word #1

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

Safety Level

SAFE

Telemetry Verification

B.120 set sofie ssg_echo1T

Packet Target Application Identifier

sofie, 0x181, (385)

Description

SSG Echo one word (Timed Execution)

Discussion

See set_ssg_echo1.

Command Target

sofie

Format

	opcode	subfield(s)		
	0xcc00	Time	data1	Command size = 64 bits = 8 bytes.
bit	0 15	16 47	48 63	

Subfield(s)

Time: Time of command execution

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer				default	

data1: word #1

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

Safety Level

SAFE

Telemetry Verification

B.121 set sofie ssg_echo2

Packet Target Application Identifier

sofie, 0x180, (384)

Description

SSG Echo two words

Discussion

This command is used to test the communication link. Upon receipt of the Echo command, SSG hardware responds with an identical packet. Only the response opcode and checksum will be different. The maximum number of data words is 2.

Constraints

Allowable parameter values are:

1 = echo one word,

2 = echo two words,

3 = echo three words.

Command Target

sofie

Format

	opcode	subfield(s)	
	0xcc00	data1	data2
bit	0 15	16 31	32 47

Command size = 48 bits = 6 bytes.

Subfield(s)

data1: word #1

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

data2: word #2

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

Safety Level

SAFE

Telemetry Verification

B.122 set sofie ssg_echo2T

Packet Target Application Identifier

sofie, 0x181, (385)

Description

SSG Echo two words (Timed Execution)

Discussion

See set_ssg_echo2.

Command Target

sofie

Format

	opcode	subfield(s)							
	0xcc00	Time		data1		data2		Command size = 80 bits = 10 bytes.	
bit	0	15	16	47	48	63	64	79	

Subfield(s)

Time: Time of command execution

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer				default	

data1: word #1

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

data2: word #2

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

Safety Level

SAFE

Telemetry Verification

B.123 set sofie ssg_echo3

Packet Target Application Identifier

sofie, 0x180, (384)

Description

SSG Echo three words

Discussion

This command is used to test the communication link. Upon receipt of the Echo command, SSG hardware responds with an identical packet. Only the response opcode and checksum will be different. The maximum number of data words is 3.

Constraints

Allowable parameter values are:

1 = echo one word,

2 = echo two words,

3 = echo three words.

Command Target

sofie

Format

	opcode	subfield(s)					
	0xcc00	data1		data2		data3	
bit	0 15	16	31	32	47	48	63

Command size = 64 bits = 8 bytes.

Subfield(s)

data1: word #1

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

data2: word #2

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

data3: word #3

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

Safety Level

SAFE

Telemetry Verification

B.124 set sofie ssg_echo3T

Packet Target Application Identifier

sofie, 0x181, (385)

Description

SSG Echo three words (Timed Execution)

Discussion

See set_ssg_echo3.

Command Target

sofie

Format

	opcode	subfield(s)							
	0xcc00	Time		data1		data2		data3	
bit	0 15	16	47	48	63	64	79	80	95

Command size = 96 bits = 12 bytes.

Subfield(s)

Time: Time of command execution

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer				default	

data1: word #1

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

data2: word #2

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

data3: word #3

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

Safety Level

SAFE

Telemetry Verification

B.125 set sofie ssg_poke

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Load SSG memory register

Discussion

This command loads any available register in memory. The desired register is specified by 'address'. The SSG hardware responds by generating a message that echoes the 'address', provides the register's previous value and its new value.

Command Target

sofie

Format

	opcode	subfield(s)			
	0xccf1	address		value	
bit	0 15	16	31	32	47

Command size = 48 bits = 6 bytes.

Subfield(s)

address: address of register to load

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

value: load value

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

Safety Level

SAFE

Telemetry Verification

B.126 set sofie ssg_pokeT

Packet Target Application Identifier

sofie, 0x181, (385)

Description

Load SSG memory register (Timed Execution)

Discussion

See set_ssg_poke.

Command Target

sofie

Format

	opcode	subfield(s)							
	0xccf1	Time		address		value			Command size = 80 bits = 10 bytes.
bit	0	15	16	47	48	63	64	79	

Subfield(s)

Time: Time of command execution

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer				default	

address: address of register to load

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

value: load value

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

Safety Level

SAFE

Telemetry Verification

B.127 set sofie sunris_event

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Set Sunrise Event

Discussion

Set the absolute start time and event command table number for the requested event number. If the science event table has not previously been initialized then this function will call csc07SEPSetupScienceEventTable to initialize the table. The requested event number for this command will be used as the starting event number in the table. The functions used for this command are identical to those used for Set Sunset Event. If this command successfully updates the event start time and table number it returns the set_sunris_event opcode, event number, event start time and event command table number in the system data packet.

Constraints

If the science event table has not been initialized before this command is executed then an X4D_WARNING_EVENT_TABLE_NOT_PREV warning will be generated. The requested event number is returned in the additional error information word. If the event number parameter is less than the range currently held in the event table then an X4D_EVENT_NUMBER_OUTSIDE_CURRENT_R error is generated. The requested event number is returned in the additional error information word. If the requested event number is greater than the range currently held in the event table then an X4D_EVENT_NUMBER_OUTSIDE_CURRENT_RANGE error is generated. The requested event number is returned in the additional error information word. If the requested event command table number is less than the allowed range (1 to 63) then an X4D_EVENT_TABLE_NUMBER_OUTSIDE_RANGE_LOW error is generated. The errant event table number is returned in the additional error information word. If the requested event command table number is greater than the allowed range (1 to 63) then an X4D_EVENT_TABLE_NUMBER_OUTSIDE_RANGE_H is generated. The errant event table number is returned in the additional error information word.

Command Target

sofie

Format

	opcode	subfield(s)						
	0xbb61	eventNo		eventTime		table		Command size = 80 bits = 10 bytes.
bit	0 15	16	31	32	63	64	79	

Subfield(s)

eventNo: event number

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

eventTime: time of sunrise event

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer	dn	0	4294967295	default	0

table: event table

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

Safety Level

SAFE

Telemetry Verification

B.128 set sofie sunris_time

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Set Time of Sunrise Event

Constraints

This command is a remnant from the descoped autonomy functions. It remains as a placeholder should the autonomy functions be added in the future.

Command Target

sofie

Format

opcode	subfield(s)
0xbb21	eventTime

Command size = 48 bits = 6 bytes.

bit 0 15 16 47

Subfield(s)

eventTime: time of sunrise event

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer	dn	0	4294967295	default	0

Safety Level

SAFE

Telemetry Verification

B.129 set sofie sunris_timeT

Packet Target Application Identifier

sofie, 0x181, (385)

Description

Set Time of Sunrise Event (Timed execution)

Constraints

This command is a remnant from the descoped autonomy functions. It remains as a placeholder should the autonomy functions be added in the future.

Command Target

sofie

Format

	opcode	subfield(s)			
	0xbb21	Time		eventTime	Command size = 80 bits = 10 bytes.
bit	0 15	16	47	48 79	

Subfield(s)

Time: time of command execution

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer	dn	0	4294967295	default	0

eventTime: time of sunrise event

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer	dn	0	4294967295	default	0

Safety Level

SAFE

Telemetry Verification

B.130 set sofie sunset_event

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Set Sunset Event

Discussion

Set the absolute start time and event command table number for the requested event number. If the science event table has not previously been initialized then this function will call csc07SEPSetupScienceEventTable to initialize the table. The requested event number for this command will be used as the starting event number in the table. The functions

used for this command are identical to those used for Set Sunrise Event. If this command successfully updates the event start time and table number it returns the set_sunset_event opcode, event number, event start time and event command table number in the system data packet.

Constraints

If the science event table has not been initialized before this command is executed then an X4D_WARNING_EVENT_TABLE_NOT_PREV warning will be generated. The requested event number is returned in the additional error information word. If the event number parameter is less than the range currently held in the event table then an X4D_EVENT_NUMBER_OUTSIDE_CURRENT_R error is generated. The requested event number is returned in the additional error information word. If the requested event number is greater than the range currently held in the event table then an X4D_EVENT_NUMBER_OUTSIDE_CURRENT_RANGE error is generated. The requested event number is returned in the additional error information word. If the requested event command table number is less than the allowed range (1 to 63) then an X4D_EVENT_TABLE_NUMBER_OUTSIDE_RANGE_LOW error is generated. The errant event table number is returned in the additional error information word. If the requested event command table number is greater than the allowed range (1 to 63) then an X4D_EVENT_TABLE_NUMBER_OUTSIDE_RANGE_H is generated. The errant event table number is returned in the additional error information word.

Command Target

sofie

Format

	opcode	subfield(s)					
	0xbb60	eventNo		eventTime		table	
bit	0 15	16	31	32	63	64	79

Command size = 80 bits = 10 bytes.

Subfield(s)

eventNo: event number

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

eventTime: time of sunset event

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer	dn	0	4294967295	default	0

table: event table

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

Safety Level

SAFE

Telemetry Verification

B.131 set sofie sunset_time

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Set Time of Sunset Event

Constraints

This command is a remnant from the descoped autonomy functions. It remains as a placeholder should the autonomy functions be added in the future.

Command Target

sofie

Format

	opcode	subfield(s)
	0xbb22	eventTime

Command size = 48 bits = 6 bytes.

bit	0	15	16	47

Subfield(s)

eventTime: time of sunset event

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer	dn	0	4294967295	default	0

Safety Level

SAFE

Telemetry Verification

B.132 set sofie sunset_timeT

Packet Target Application Identifier

sofie, 0x181, (385)

Description

Set Time of Sunset Event (Timed execution)

Constraints

This command is a remnant from the descoped autonomy functions. It remains as a placeholder should the autonomy functions be added in the future.

Command Target

sofie

Format

	opcode	subfield(s)	
	0xbb22	Time	eventTime

Command size = 80 bits = 10 bytes.

bit	0	15	16	47	48	79

Subfield(s)

Time: time of command execution

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer	dn	0	4294967295	default	0

eventTime: time of sunset event

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer	dn	0	4294967295	default	0

Safety Level

SAFE

Telemetry Verification

B.133 set sofie track_abort

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Sun Sensor Track Abort

Discussion

(0 = normal, 1 = abort observation)

Constraints

This command will set or reset the Sun Sensor Track Abort bit in the SSB State and Event Shared Memory Table. If the Abort bit is set then the Sun Sensor Track Acquire bit will be reset.

Valid parameters 0 = reset, 1 = set.

Any other value will result in an invalid track parameter error.

Command Target

sofie

Format

	opcode	subfield(s)
	0xdd8b	sstrack_abort

Command size = 32 bits = 4 bytes.

bit 0 15 16 31

Subfield(s)

sstrack_abort: Boolean Sun Sensor Track Abort 0 = normal, 1 = abort observation

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

Safety Level

SAFE

Telemetry Verification

B.134 set sofie track_abortT

Packet Target Application Identifier

sofie, 0x181, (385)

Description

Sun Sensor Track Abort (Timed execution)

Discussion

(0 = normal, 1 = abort observation)

Command Target

sofie

Format

	opcode	subfield(s)	
	0xdd8b	Time	sstrack_abort

Command size = 64 bits = 8 bytes.

bit	0	15	16	47	48	63

Subfield(s)

Time: time of command execution

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer	dn	0	4294967295	default	0

sstrack_abort: Boolean Sun Sensor Track Abort 0 = normal, 1 = abort observation

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

Safety Level

SAFE

Telemetry Verification

B.135 set sofie track_acqui

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Sun Sensor Track Acquire

Discussion

(0 = normal, 1 = acquire and track sun)

Constraints

This command will set or reset the Sun Sensor Track Acquire bit in the SSB State and Event Shared Memory Table.

Valid parameters 0 = reset, 1 = set.

Any other value will result in an invalid track parameter error.

Command Target

sofie

Format

	opcode	subfield(s)	
	0xdd8c	sstrack_acquire	Command size = 32 bits = 4 bytes.
bit	0 15	16 31	

Subfield(s)

sstrack_acquire: Boolean Sun Sensor Track Acquire 0 = normal, 1 = acquire and track

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

Safety Level

SAFE

Telemetry Verification

B.136 set sofie track_acquiT

Packet Target Application Identifier

sofie, 0x181, (385)

Description

Sun Sensor Track Acquire (Timed execution)

Discussion

(0 = normal, 1 = acquire and track sun)

Command Target

sofie

Format

	opcode	subfield(s)		
	0xdd8c	Time	sstrack_acquire	Command size = 64 bits = 8 bytes.
bit	0 15	16 47	48 63	

Subfield(s)

Time: time of command execution

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer	dn	0	4294967295	default	0

sstrack_acquire: Boolean Sun Sensor Track Acquire 0 = normal, 1 = acquire and track

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

Safety Level

SAFE

Telemetry Verification

B.137 set sofie track_data

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Sun Sensor Track Data

Discussion

(0 = normal, 1 = acquire, track sun, and transmit data)

Constraints

This command will set or reset the Sun Sensor Track Data bit in the SSB State and Event Shared Memory Table.

Valid parameters 0 = reset, 1 = set.

Any other value will result in an invalid track parameter error.

Command Target

sofie

Format

	opcode	subfield(s)
	0xdd8d	sstrack_data_dl

Command size = 32 bits = 4 bytes.

bit 0 15 16 31

Subfield(s)

sstrack_data_dl: Boolean Sun Sensor Track Data 0 = normal, 1 = acquire, track, and transmit dat

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

Safety Level

SAFE

Telemetry Verification

B.138 set sofie track_dataT

Packet Target Application Identifier

sofie, 0x181, (385)

Description

Sun Sensor Track Data (Timed execution)

Discussion

(0 = normal, 1 = acquire, track sun, and transmit data)

Command Target

sofie

Format

	opcode	subfield(s)	
	0xdd8d	Time	sstrack_data_dl

Command size = 64 bits = 8 bytes.

bit	0	15	16	47	48	63

Subfield(s)

Time: time of command execution

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer	dn	0	4294967295	default	0

sstrack_data_dl: Boolean Sun Sensor Track Data 0 = normal, 1 = acquire, track, and transmit dat

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

Safety Level

SAFE

Telemetry Verification

B.139 set sofie track_param

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Set Sun Tracking Algorithm Parameter

Discussion

This command writes a Sun Tracking Algorithm value to the SSB State and Event Shared Memory Table.

Command Target

sofie

Format

	opcode	subfield(s)	
	0xdd85	suntrk_parameter	suntrk_value
bit	0 15	16 31	32 47

Command size = 48 bits = 6 bytes.

Subfield(s)

suntrk_parameter: Sun Tracking Algorithm Parameter

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

suntrk_value: Sun Tracking Algorithm Parameter value

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

Safety Level

SAFE

Telemetry Verification

B.140 set sofie track_paramT

Packet Target Application Identifier

sofie, 0x181, (385)

Description

Set Sun Tracking Algorithm Parameter (Timed execution)

Discussion

This command writes a Sun Tracking Algorithm value to the SSB State and Event Shared Memory Table.

Command Target

sofie

Format

	opcode	subfield(s)		
	0xdd85	Time	suntrk_parameter	suntrk_value
bit	0 15	16 47	48 63	64 79

Command size = 80 bits = 10 bytes.

Subfield(s)

Time: time of command execution

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer	dn	0	4294967295	default	0

suntrk_parameter: Sun Tracking Algorithm Parameter

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

suntrk_value: Sun Tracking Algorithm Parameter value

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

Safety Level

SAFE

Telemetry Verification

B.141 set sofie track_stby

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Sun Sensor Track Standby

Discussion

(0 = not in standby mode, 1 = in standby mode)

Constraints

This command will set or reset the Sun Sensor Track Standby bit in the SSB State and Event Shared Memory Table.

Valid parameters 0 = reset, 1 = set.

Any other value will result in an invalid track parameter error.

Command Target

sofie

Format

	opcode	subfield(s)
	0xdd8a	sstrack_switch

Command size = 32 bits = 4 bytes.

bit 0 15 16 31

Subfield(s)

sstrack_switch: Boolean Sun Sensor Track Standby 0 = not standby, 1 = standby

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

Safety Level

SAFE

Telemetry Verification

B.142 set sofie track_stbyT

Packet Target Application Identifier

sofie, 0x181, (385)

Description

Sun Sensor Track Standby (Timed execution)

Discussion

(0 = not in standby mode, 1 = in standby mode)

Command Target

sofie

Format

	opcode	subfield(s)		
	0xdd8a	Time	sstrack_switch	Command size = 64 bits = 8 bytes.
bit	0 15	16 47	48 63	

Subfield(s)

Time: time of command execution

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer	dn	0	4294967295	default	0

sstrack_switch: Boolean Sun Sensor Track Standby 0 = not standby, 1 = standby

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

Safety Level

SAFE

Telemetry Verification

B.143 test sofie cdh_chksum

Packet Target Application Identifier

sofie, 0x183, (387)

Description

Checksum of image running in instruction SRAM

Discussion

Performs a commanded checksum test of the C&DH SRAM code image. This command does the following:

1. Calculates the checksum of the code image currently running in C&DH instruction SRAM.

2. Compares the calculated checksum with the checksum stored in memory.

3. If the calculated checksum does not match the stored checksum a bad image checksum error message is generated.

Command Target

sofie

Format

	opcode
	0xbba9

Command size = 16 bits = 2 bytes.

bit 0 15

Subfield(s)

Safety Level

SAFE

Telemetry Verification

B.144 test sofie cdh_sram1

Packet Target Application Identifier

sofie, 0x183, (387)

Description

C&DH Data (Operand) SRAM Pattern Test

Discussion

Diagnostic write/read test for C&DH Data SRAM. Intended to search for bad memory locations.

Constraints

This command writes a specified test pattern to the specified locations in C&DH Data SRAM. It is the operators responsibility to assure that the Start address and Length are valid. Before writing the test pattern the original value is saved into a register. After the test pattern is written and tested the original value is written back to the memory location being tested. This allows the Data SRAM to be tested without destroying the original value. This command generates a single word response = error count. The addresses of up to the first 0x400 memory locations that generated an error will be saved at address B780h and can be downloaded using the dump_cdh_sram1 command. No error code is placed in the error map.

Command Target

sofie

Format

	opcode	subfield(s)					
	0xbba4	address		length		pattern	

Command size = 64 bits = 8 bytes.

bit 0 15 16 31 32 47 48 63

Subfield(s)

address: address for Data (Operand) SRAM Pattern Test C&DH

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

length: number of address locations to test

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

pattern: test pattern

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

Safety Level

SAFE

Telemetry Verification

B.145 test sofie cdh_sram2

Packet Target Application Identifier

sofie, 0x183, (387)

Description

C&DH Instruction SRAM Pattern Test

Discussion

Diagnostic write/read test for C&DH Instruction SRAM. Intended to search for bad memory locations.

Constraints

This command writes a specified test pattern to the specified locations in C&DH Instruction SRAM. IT IS THE OPERATORS RESPONSIBILITY TO ASSURE THAT THE START ADDRESS AND LENGTH ARE VALID AND THAT NO CODE SEGMENT THAT IS CURRENTLY BEING EXECUTED BY THE CPU IS TESTED WITH THIS COMMAND! Before writing the test pattern the original value is saved into a register. After the test pattern is written and tested the original value is written back to the memory location being tested. This allows the instruction SRAM to be tested without destroying the original value. If the operator selects an instruction SRAM segment that does not interfere with code execution causing the watchdog timer to reset the CPU this command will generate a single word response = error count. The addresses of up to the first 0x400 memory locations that generated an error will be saved at address B780h and can be downloaded using the dump_cdh_sram1 command. No error code is placed in the error map.

Command Target

sofie

Format

	opcode	subfield(s)					
	0xbba5	address		length		pattern	
bit	0 15	16	47	48	63	64	79

Command size = 80 bits = 10 bytes.

Subfield(s)

address: address for Instruction SRAM Pattern Test C&DH

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer	dn	0	4294967295	default	0

length: number of address locations to test

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

pattern: test pattern

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

Safety Level

SAFE

Telemetry Verification

B.146 test sofie ee_chksum

Packet Target Application Identifier

sofie, 0x183, (387)

Description

Code Image Checksum Test

Discussion

Performs a commanded checksum test of the EEPROM.

Constraints

This command performs a checksum on a specified code image in EEPROM. It is the operators responsibility to assure that the OD address and address point to the beginning of a valid code image. This command generates a two word response: word 1 = Checksum read from memory, word 2 = calculated checksum.

Command Target

sofie

Format

	opcode	subfield(s)		
	0xbba2	OD_address	address	Command size = 48 bits = 6 bytes.
bit	0 15	16 31	32 47	

Subfield(s)

OD_address: bank select OD bits for memory address

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

address: address of code image

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

Safety Level

SAFE

Telemetry Verification

B.147 test sofie ssb_chksum

Packet Target Application Identifier

sofie, 0x183, (387)

Description

Checksum of image running in instruction SRAM

Discussion

Performs a commanded checksum test of the SSB SRAM code image. This command does the following:

1. Calculates the checksum of the code image currently running in SSB instruction SRAM.

2. Compares the calculated checksum with the checksum stored in memory.

3. If the calculated checksum does not match the stored checksum a bad image checksum error message is generated.

Command Target

sofie

Format

	opcode
	0xdda6
bit	0 15

Command size = 16 bits = 2 bytes.

Subfield(s)

Safety Level

SAFE

Telemetry Verification

B.148 test sofie ssb_sram1

Packet Target Application Identifier

sofie, 0x183, (387)

Description

SS&SM Data (Operand) SRAM Pattern Test

Discussion

Diagnostic write/read test for SSB Data SRAM. Intended to search for bad memory locations.

Constraints

This command writes a specified test pattern to the specified locations in SSB Data SRAM. It is the operators responsibility to assure that the Start address and Length are valid. Before writing the test pattern the original value is saved into a register. After the test pattern is written and tested the original value is written back to the memory location being tested. This allows the Data SRAM to be tested without destroying the original value. This command generates a single word response = error count. The addresses of up to the first 0x400 memory locations that generated an error will be saved at address 4380h and can be downloaded using the dump_ssb_sram1 command. No error code is placed in the error map.

Command Target

sofie

Format

	opcode	subfield(s)					
	0xdda1	address		length		pattern	
bit	0 15	16 31		32 47		48 63	

Command size = 64 bits = 8 bytes.

Subfield(s)

address: address for Data (Operand) SRAM Pattern Test SS&SM

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

length: number of address locations to test

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

pattern: test pattern

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

Safety Level

SAFE

Telemetry Verification

B.149 test sofie ssb_sram2

Packet Target Application Identifier

sofie, 0x183, (387)

Description

SS&SM Instruction SRAM Pattern Test

Discussion

Diagnostic write/read test for SSB Instruction SRAM. Intended to search for bad memory locations.

Constraints

This command writes a specified test pattern to the specified locations in SSB Instruction SRAM. IT IS THE OPERATORS RESPONSIBILITY TO ASSURE THAT THE START ADDRESS AND LENGTH ARE VALID AND THAT NO CODE SEGMENT THAT IS CURRENTLY BEING EXECUTED BY THE CPU IS TESTED WITH THIS COMMAND! Before writing the test pattern the original value is saved into a register. After the test pattern is written and tested the original value is written back to the memory location being tested. This allows the instruction SRAM to be tested without destroying the original value. If the operator selects an instruction SRAM segment that does not interfere with code execution causing the watchdog timer to reset the CPU this command will generate a single word response = error count. The addresses of up to the first 0x400 memory locations that generated an error will be saved at address 4380h and can be downloaded using the dump_ssb_sram1 command. No error code is placed in the error map.

Command Target

sofie

Format

	opcode	subfield(s)					
	0xdda2	address		length		pattern	
bit	0 15	16	47	48	63	64	79

Command size = 80 bits = 10 bytes.

Subfield(s)

address: address for Instruction SRAM Pattern Test SS&SM

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer	dn	0	4294967295	default	0

length: number of address locations to test

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

pattern: test pattern

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer	dn	0	65535	default	0

Safety Level

SAFE

Telemetry Verification

B.150 test sofie timesync

Packet Target Application Identifier

sofie, 0x183, (387)

Description

Time Synchronization Test

Discussion

This command is used to synchronize the C&DH, SSB, and SSG relative timers. The result of the synchronization is recorded in the Software Status Register. If the command is successful bit 20 in the CDH software status register and the SSB software status registers will be set. Time messages will be sent to the free format area of the system data packet as follows. CDH ee04 1st word = hi order seconds, 2nd word = low order seconds, 3rd word = hi order subseconds, 4th word low order subseconds.

Command Target

sofie

Format

	opcode
	0xbba1

Command size = 16 bits = 2 bytes.

bit 0 15

Subfield(s)

Safety Level

SAFE

Telemetry Verification

B.151 turn off sofie all

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Shutdown C&DH and Sun Sensor

Discussion

Prepare SOFIE for power shutdown.

Constraints

This command does the following:

1. Sends turn_off_ssb command to SSB board.
2. Turns off TEC channels.
3. Places the C&DH in Safe Mode.

Note: It does NOT shutdown the C&DH power.

Command Target

sofie

Format

opcode
0xbb40

Command size = 16 bits = 2 bytes.

bit 0 15

Subfield(s)

Safety Level

SAFE

Telemetry Verification

B.152 turn off sofie cdh

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Shutdown C&DH

Discussion

Prepare CDH for power shutdown.

Constraints

This command does the following:

1. Turns off TEC channels.

2. Places the C&DH in Safe Mode.

Note: It does NOT shutdown the C&DH power.

Command Target

sofie

Format

opcode
0xbb41

Command size = 16 bits = 2 bytes.

bit 0 15

Subfield(s)

Safety Level

SAFE

Telemetry Verification

B.153 turn off sofie ssb

Packet Target Application Identifier
sofie, 0x180, (384)

Description
Shutdown Sun Sensor

Discussion
Prepare SSB for power shutdown.

Constraints
This command does the following:

1. Sends command to SSG board to move the mirror to 0,0.
2. Sends reset command to SSG board to turn off the servos.
3. Places the SSB board in Standby Mode.

Note: It does NOT shutdown the SSB power.

Command Target
sofie

Format

	opcode
	0xdd40

Command size = 16 bits = 2 bytes.

bit 0 15

Subfield(s)

Safety Level
SAFE

Telemetry Verification

B.154 use sofie balance

Packet Target Application Identifier
sofie, 0x180, (384)

Description
Select balance table to use

Command Target

software

Format

	opcode	subfield(s)
	0xbb8a	event_type

Command size = 32 bits = 4 bytes.

bit 0 15 16 31

Subfield(s)

event_type: Event type 0=sunrise, 1=sunset

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

Safety Level

SAFE

Telemetry Verification

B.155 use sofie balanceT

Packet Target Application Identifier

sofie, 0x181, (385)

Description

Select balance table to use (timed execution)

Command Target

software

Format

	opcode	subfield(s)	
	0xbb8a	Time	event_type

Command size = 64 bits = 8 bytes.

bit 0 15 16 47 48 63

Subfield(s)

Time: time of command execution

bits	type	eng units	min (dn)	max (dn)	state	value
32	unsigned integer				default	

event_type: Event type 0=sunrise, 1=sunset

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

Safety Level

SAFE

Telemetry Verification

B.156 use sofie cdh_image

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Specify C&DH code image to load

Discussion

Select which copy of CDH code image to use. One of several code images may be selected by address.

Constraints

Allows user to select any OD address and start address. It is the operators responsibility to assure these values point to a valid code image.

Command Target

sofie

Format

	opcode	subfield(s)	
	0xbb05	OD_address	start_address

Command size = 48 bits = 6 bytes.

bit	0	15	16	31	32	47

Subfield(s)

OD_address: Bank select OD bits for memory address

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

start_address: start address of code image

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

Safety Level

SAFE

Telemetry Verification

B.157 use sofie ssb_image

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Specify SSB code image to load

Discussion

Select which copy of SSB code image to use. One of several code images may be selected by address.

Constraints

Allows user to select any OD address and start address. It is the operators responsibility to assure these values point to a valid code image.

Command Target

sofie

Format

	opcode	subfield(s)	
	0xbb06	OD_address	start_address

Command size = 48 bits = 6 bytes.

bit	0	15	16	31	32	47

Subfield(s)

OD_address: Bank select OD bits for memory address

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

start_address: start address of code image

bits	type	eng units	min (dn)	max (dn)	state	value
16	unsigned integer				default	

Safety Level

SAFE

Telemetry Verification

B.158 wake sofie

Packet Target Application Identifier

sofie, 0x180, (384)

Description

Remove sofie safing constraints, allowing transition out of safe hold.

Constraints

This command is only valid as a real-time command (cannot be executed in a sequence).

Command Target

sofie software

Format

opcode
0xfb00

Command size = 16 bits = 2 bytes.

bit 0 15

Subfield(s)

Safety Level

SAFE

Telemetry Verification

sofie cmd_succ_ct (??)

Related Commands

command	*description*
safe sofie (79)	Place the sofie instrument in a safe state.

C

Command Opcode Summary

Command Opcode Summary

cmd ref.	apid ref.	apid (hex)	opcode (hex)	command
1	1	0x15d	0xfc	**inform inst sc_clock** (28)
2	1	0x15e	0xfe	**inform inst acs_state** (27)
3	1	0x181	0x0000	**issue sofie reserved_1** (55)
4	1	0x180	0x0000	**noop sofie** (57)
5	1	0x183	0x0000	**issue sofie reserved_3** (57)
6	1	0x182	0x0000	**issue sofie reserved_2** (56)
7	1	0x180	0x0000	**issue sofie command** (55)
8	2	0x180	0xbb00	**reset sofie s30_timer** (72)
9	1	0x182	0xbb01	**pass sofie codeload2** (59)
10	2	0x182	0xbb02	**pass sofie codeload3** (60)
11	3	0x182	0xbb03	**pass sofie codeload4** (61)
12	1	0x180	0xbb05	**use sofie cdh_image** (148)
13	2	0x180	0xbb06	**use sofie ssb_image** (148)
14	3	0x180	0xbb20	**set sofie m1553_chksm** (101)
15	1	0x181	0xbb20	**set sofie m1553_chksmT** (102)
16	1	0x180	0xbb21	**set sofie sunris_time** (126)
17	1	0x181	0xbb21	**set sofie sunris_timeT** (127)
18	2	0x181	0xbb22	**set sofie sunset_timeT** (129)
19	1	0x180	0xbb22	**set sofie sunset_time** (128)
20	1	0x181	0xbb23	**set sofie orb_periodT** (104)
21	1	0x180	0xbb23	**set sofie orb_period** (104)
22	1	0x181	0xbb24	**set sofie sci_tableT** (108)
23	1	0x180	0xbb24	**set sofie sci_table** (107)
24	1	0x181	0xbb25	**set sofie bore_tableT** (87)
25	1	0x180	0xbb25	**set sofie bore_table** (86)
26	2	0x180	0xbb26	**set sofie gain_table** (99)
27	1	0x181	0xbb26	**set sofie gain_tableT** (100)
28	2	0x181	0xbb27	**set sofie bore_freqT** (85)
29	1	0x180	0xbb27	**set sofie bore_freq** (84)

Command Opcode Summary, cont'd

cmd ref.	apid ref.	apid (hex)	opcode (hex)	command
30	1	0x181	0xbb28	**set sofie gain_freqT** (98)
31	1	0x180	0xbb28	**set sofie gain_freq** (98)
32	2	0x180	0xbb29	**set sofie endata_rate** (92)
33	1	0x181	0xbb29	**set sofie endata_rateT** (93)
34	2	0x181	0xbb2b	**set sofie autrep_rateT** (84)
35	1	0x180	0xbb2b	**set sofie autrep_rate** (83)
36	2	0x180	0xbb2c	**set sofie event_pred** (94)
37	1	0x181	0xbb2c	**set sofie event_predT** (94)
38	1	0x180	0xbb2d	**set sofie mcurr_limit** (102)
39	1	0x181	0xbb2d	**set sofie mcurr_limitT** (103)
40	1	0x180	0xbb2e	**set sofie faultovercd** (95)
41	1	0x181	0xbb2e	**set sofie faultovercdT** (96)
42	1	0x180	0xbb2f	**set sofie sci_evt_tbl** (106)
43	2	0x180	0xbb40	**inform sofie pwrdown** (53)
44	3	0x180	0xbb40	**turn off sofie all** (144)
45	4	0x180	0xbb41	**turn off sofie cdh** (145)
46	5	0x180	0xbb42	**reset sofie all** (68)
47	6	0x180	0xbb43	**reset sofie cdh** (69)
48	7	0x180	0xbb44	**arm sofie cover_rls** (29)
49	8	0x180	0xbb45	**release sofie cover_rl** (67)
50	9	0x180	0xbb46	**reset sofie cover_rls** (70)
51	10	0x180	0xbb47	**select sofie standby** (82)
52	11	0x180	0xbb48	**select sofie safe** (79)
53	12	0x180	0xbb49	**select sofie science** (80)
54	13	0x180	0xbb4a	**reset sofie tc_table** (78)
55	14	0x180	0xbb4b	**reset sofie tc_entry** (76)
56	15	0x180	0xbb4c	**reset sofie tc_range** (77)
57	16	0x180	0xbb4d	**get sofie event_info** (38)
58	17	0x180	0xbb4e	**get sofie next_event** (39)
59	18	0x180	0xbb60	**set sofie sunset_event** (127)
60	19	0x180	0xbb61	**set sofie sunris_event** (125)
61	20	0x180	0xbb62	**pass sofie ssainit_tbl** (64)
62	1	0x181	0xbb80	**set sofie cdh_echoT** (88)
63	1	0x180	0xbb80	**set sofie cdh_echo** (87)
64	1	0x181	0xbb83	**set sofie cdh_regT** (90)
65	1	0x180	0xbb83	**set sofie cdh_reg** (89)
66	2	0x180	0xbb84	**pass sofie ss_aztable** (62)
67	3	0x180	0xbb85	**pass sofie ss_eltable** (63)
68	4	0x180	0xbb86	**perform sofie balance** (65)
69	1	0x181	0xbb86	**perform sofie balanceT** (66)
70	1	0x180	0xbb87	**reset sofie error_map** (71)
71	1	0x181	0xbb87	**reset sofie error_mapT** (71)
72	2	0x181	0xbb88	**get sofie sys_messageT** (52)
73	1	0x180	0xbb88	**get sofie sys_message** (51)
74	2	0x180	0xbb89	**set sofie cdh_sram** (90)

Command Opcode Summary, cont'd

cmd ref.	apid ref.	apid (hex)	opcode (hex)	command
75	1	0x181	0xbb89	**set sofie cdh_sramT** (91)
76	1	0x180	0xbb8a	**use sofie balance** (146)
77	1	0x181	0xbb8a	**use sofie balanceT** (147)
78	1	0x183	0xbba0	**get sofie cdh_reg** (36)
79	2	0x183	0xbba1	**test sofie timesync** (144)
80	3	0x183	0xbba2	**test sofie ee_chksum** (140)
81	4	0x183	0xbba4	**test sofie cdh_sram1** (138)
82	5	0x183	0xbba5	**test sofie cdh_sram2** (139)
83	6	0x183	0xbba6	**dump sofie eeprom** (32)
84	7	0x183	0xbba7	**dump sofie cdh_sram1** (30)
85	8	0x183	0xbba8	**dump sofie cdh_sram2** (31)
86	9	0x183	0xbba9	**test sofie cdh_chksum** (137)
87	10	0x183	0xbbaa	**get sofie cdh_sram** (37)
88	1	0x181	0xcc00	**set sofie ssg_echo3T** (122)
89	2	0x181	0xcc00	**set sofie ssg_echo2T** (120)
90	3	0x181	0xcc00	**set sofie ssg_echo1T** (119)
91	1	0x180	0xcc00	**set sofie ssg_echo2** (120)
92	2	0x180	0xcc00	**set sofie ssg_echo1** (118)
93	3	0x180	0xcc00	**set sofie ssg_echo3** (121)
94	1	0x181	0xcc01	**enable sofie servosT** (36)
95	1	0x180	0xcc01	**enable sofie servos** (35)
96	2	0x180	0xcc03	**reset sofie ssg** (75)
97	1	0x181	0xcc03	**reset sofie ssgT** (76)
98	1	0x180	0xcc10	**get sofie ssg_status** (48)
99	1	0x181	0xcc10	**get sofie ssg_statusT** (49)
100	1	0x180	0xcc11	**get sofie ssg_state** (46)
101	1	0x181	0xcc11	**get sofie ssg_stateT** (47)
102	2	0x181	0xcc13	**get sofie ssg_positT** (46)
103	1	0x180	0xcc13	**get sofie ssg_posit** (45)
104	2	0x180	0xcc14	**get sofie ssg_PIDreg** (42)
105	1	0x181	0xcc14	**get sofie ssg_PIDregT** (43)
106	2	0x181	0xcc20	**set sofie ssg_az_elT** (117)
107	1	0x180	0xcc20	**set sofie ssg_az_el** (116)
108	2	0x180	0xcc21	**set sofie ssg_PIDreg** (115)
109	3	0x180	0xccf0	**get sofie ssg_peek** (44)
110	1	0x181	0xccf0	**get sofie ssg_peekT** (44)
111	2	0x181	0xccf1	**set sofie ssg_pokeT** (124)
112	1	0x180	0xccf1	**set sofie ssg_poke** (123)
113	2	0x180	0xdd00	**pass sofie codeload1** (58)
114	3	0x180	0xdd01	**reset sofie code_chksm** (70)
115	4	0x180	0xdd20	**set sofie faultoverss** (96)
116	1	0x181	0xdd20	**set sofie faultoverssT** (97)
117	1	0x180	0xdd40	**turn off sofie ssb** (146)
118	2	0x180	0xdd41	**reset sofie ssb** (73)
119	3	0x180	0xdd42	**get sofie ssb_status** (42)

Command Opcode Summary, cont'd

cmd ref.	apid ref.	apid (hex)	opcode (hex)	command
120	4	0x180	0xdd43	**get sofie ssb_oper** (40)
121	5	0x180	0xdd44	**select sofie ssb_quiet** (81)
122	6	0x180	0xdd45	**reset sofie ssb_timer** (75)
123	7	0x180	0xdd46	**select sofie standby_S** (82)
124	8	0x180	0xdd47	**select sofie science_S** (81)
125	9	0x180	0xdd80	**set sofie ssb_echo** (109)
126	1	0x181	0xdd80	**set sofie ssb_echoT** (109)
127	1	0x180	0xdd81	**set sofie ssbp_echo** (113)
128	1	0x181	0xdd81	**set sofie ssbp_echoT** (114)
129	2	0x181	0xdd82	**set sofie ssb_regT** (111)
130	1	0x180	0xdd82	**set sofie ssb_reg** (110)
131	2	0x180	0xdd85	**set sofie track_param** (134)
132	1	0x181	0xdd85	**set sofie track_paramT** (135)
133	1	0x180	0xdd86	**get sofie sunimage1** (49)
134	2	0x180	0xdd87	**set sofie plelem** (106)
135	3	0x180	0xdd88	**set sofie pix_tm** (105)
136	4	0x180	0xdd8a	**set sofie track_stby** (136)
137	1	0x181	0xdd8a	**set sofie track_stbyT** (137)
138	2	0x181	0xdd8b	**set sofie track_abortT** (131)
139	1	0x180	0xdd8b	**set sofie track_abort** (130)
140	2	0x180	0xdd8c	**set sofie track_acqui** (131)
141	1	0x181	0xdd8c	**set sofie track_acquiT** (132)
142	1	0x180	0xdd8d	**set sofie track_data** (133)
143	1	0x181	0xdd8d	**set sofie track_dataT** (134)
144	1	0x180	0xdd8e	**reset sofie ssb_error** (73)
145	1	0x181	0xdd8e	**reset sofie ssb_errorT** (74)
146	1	0x180	0xdd8f	**set sofie ssb_sram** (112)
147	1	0x181	0xdd8f	**set sofie ssb_sramT** (113)
148	1	0x183	0xdda0	**get sofie ssb_reg** (40)
149	2	0x183	0xdda1	**test sofie ssb_sram1** (141)
150	3	0x183	0xdda2	**test sofie ssb_sram2** (142)
151	4	0x183	0xdda3	**dump sofie ssb_sram1** (33)
152	5	0x183	0xdda4	**dump sofie ssb_sram2** (34)
153	6	0x183	0xdda6	**test sofie ssb_chksum** (141)
154	7	0x183	0xdda7	**get sofie ssb_sram** (41)
155	1	0x180	0xfb00	**wake sofie** (149)
156	2	0x180	0xfc00	**inform sofie sc_clock** (54)
157	3	0x180	0xfd00	**safe sofie** (79)
158	4	0x180	0xfe00	**inform sofie acs_state** (52)

D

Command Packet Summary

Command Packet Summary

pkt no.	apid (hex)	packet
1	0x15d	**inst**
2	0x15e	**inst**
3	0x180	**sofie**
4	0x181	**sofie**
5	0x182	**sofie**
6	0x183	**sofie**

E

Telemetry Measurement List

OASIS-CC/FSW database version TBD, Tue Jul 11 10:08:52 2006.

E.1 sofie A_Det_V01

Description

Band 1 (O3 strong), Observation #1

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.2 sofie A_Det_V02

Description

Band 5 (H2O weak), Observation #1

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.3 sofie A_Det_V03

Description

Band 9 (particle B strong), Observation #1

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.4 sofie A_Det_V04

Description

Band 13 (CO2 B strong), Observation #1

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.5 sofie A_Det_V05

Description

Difference 1-2 (O3), Observation #1

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.6 sofie A_Det_V06

Description

Difference 5-6 (H2O), Observation #1

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.7 sofie A_Det_V07

Description

Difference 9-10 (particle B), Observation #1

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.8 sofie A_Det_V08

Description

Difference 13-14 (CO2 B), Observation #1

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.9 sofie A_Det_V09

Description

Band 2 (O3 weak), Observation #1

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.10 sofie A_Det_V10

Description

Band 6 (H2O strong), Observation #1

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.11 sofie A_Det_V11

Description

Band 10 (particle B weak), Observation #1

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.12 sofie A_Det_V12

Description

Band 14 (CO2 B weak), Observation #1

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.13 sofie A_Det_V13

Description

Band 3 (particle A strong), Observation #1

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.14 sofie A_Det_V14

Description

Band 7 (CO2 A strong), Observation #1

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.15 sofie A_Det_V15

Description

Band 11 (CH4 strong), Observation #1

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.16 sofie A_Det_V16

Description

Band 15 (NO weak), Observation #1

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.17 sofie A_Det_V17

Description

Difference 3-4 (particle A), Observation #1

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.18 sofie A_Det_V18

Description

Difference 7-8 (CO2 A), Observation #1

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.19 sofie A_Det_V19

Description

Difference 11-12 (CH4), Observation #1

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.20 sofie A_Det_V20

Description

Difference 15-16 (NO), Observation #1

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.21 sofie A_Det_V21

Description

Band 4 (particle A weak), Observation #1

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.22 sofie A_Det_V22

Description

Band 8 (CO2 A weak), Observation #1

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.23 sofie A_Det_V23

Description

Band 12 (CH4 weak), Observation #1

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.24 sofie A_Det_V24

Description

Band 16 (NO strong), Observation #1

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.25 sofie A_PnS_DMA

Description

Control Mirror Azimuth, Observation #1

Data Type

16 bits, signed integer, engineering units = dn.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	1
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.26 sofie A_PnS_DME

Description

Control Mirror Elevation, Observation #1

Data Type

16 bits, signed integer, engineering units = dn.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	1
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.27 sofie A_SMA_AMA

Description

Actual Mirror Azimuth, Observation #1

Data Type

16 bits, signed integer, engineering units = dn.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	1
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.28 sofie A_SMA_AME

Description

Actual Mirror Elevation, Observation #1

Data Type

16 bits, signed integer, engineering units = dn.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	1
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.29 sofie A_Sum_C01

Description
Center Sum 1, Observation #1

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.30 sofie A_Sum_C02

Description
Center Sum 2, Observation #1

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.31 sofie A_Sum_C03

Description
Center Sum 3, Observation #1

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.32 sofie A_Sum_C04

Description
Center Sum 4, Observation #1

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.33 sofie A_Sum_C05

Description
Center Sum 5, Observation #1

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.34 sofie A_Sum_C06

Description
Center Sum 6, Observation #1

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.35 sofie A_Sum_C07

Description
Center Sum 7, Observation #1

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.36 sofie A_Sum_HX01

Description
High X Sum 1, Observation #1

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.37 sofie A_Sum_HX02

Description
High X Sum 2, Observation #1

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.38 sofie A_Sum_HX03

Description
High X Sum 3, Observation #1

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.39 sofie A_Sum_HX04

Description
High X Sum 4, Observation #1

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.40 sofie A_Sum_HX05

Description
High X Sum 5, Observation #1

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.41 sofie A_Sum_HX06

Description
High X Sum 6, Observation #1

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.42 sofie A_Sum_HX07

Description
High X Sum 7, Observation #1

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.43 sofie A_Sum_HY01

Description
High Y Sum 1, Observation #1

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.44 sofie A_Sum_HY02

Description
High Y Sum 2, Observation #1

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.45 sofie A_Sum_HY03

Description
High Y Sum 3, Observation #1

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.46 sofie A_Sum_HY04

Description
High Y Sum 4, Observation #1

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.47 sofie A_Sum_HY05

Description
High Y Sum 5, Observation #1

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.48 sofie A_Sum_LX01

Description
Low X Sum 1, Observation #1

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.49 sofie A_Sum_LX02

Description
Low X Sum 2, Observation #1

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.50 sofie A_Sum_LX03

Description
Low X Sum 3, Observation #1

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.51 sofie A_Sum_LX04

Description
Low X Sum 4, Observation #1

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.52 sofie A_Sum_LX05

Description
Low X Sum 5, Observation #1

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.53 sofie A_Sum_LX06

Description
Low X Sum 6, Observation #1

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.54 sofie A_Sum_LX07

Description
Low X Sum 7, Observation #1

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.55 sofie A_Sum_LY01

Description
Low Y Sum 1, Observation #1

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.56 sofie A_Sum_LY02

Description
Low Y Sum 2, Observation #1

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.57 sofie A_Sum_LY03

Description
Low Y Sum 3, Observation #1

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.58 sofie A_Sum_LY04

Description
Low Y Sum 4, Observation #1

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.59 sofie A_Sum_LY05

Description
Low Y Sum 5, Observation #1

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.60 sofie A_TIME_Det

Description
Timestamp, Detector data, Observation #1

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.61 sofie A_TIME_Pix

Description
Timestamp, Pixels, Observation #1

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.62 sofie A_TIME_PnS

Description
Time stamp, Pointing and Stabilization, Observation #1

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.63 sofie A_TIME_TkA

Description
Timestamp, Tracking, Observation #1

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.64 sofie A_TkA_HiX

Description
High X FPA Coordinates, Observation #1

Data Type
16 bits, signed integer, engineering units = any.

Measurement Source
sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	0.03125
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.65 sofie A_TkA_HiY

Description

High Y FPA Coordinates, Observation #1

Data Type

16 bits, signed integer, engineering units = any.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	0.03125
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.66 sofie A_TkA_LwX

Description

Low X FPA Coordinates, Observation #1

Data Type

16 bits, signed integer, engineering units = any.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	0.03125
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.67 sofie A_TkA_LwY

Description

Low Y FPA Coordinates, Observation #1

Data Type

16 bits, signed integer, engineering units = any.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	0.03125
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.68 sofie B_Det_V01

Description

Band 1 (O3 strong), Observation #2

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.1552727099042 4e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.69 sofie B_Det_V02

Description

Band 5 (H2O weak), Observation #2

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.70 sofie B_Det_V03

Description

Band 9 (particle B strong), Observation #2

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.71 sofie B_Det_V04

Description

Band 13 (CO2 B strong), Observation #2

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.72 sofie B_Det_V05

Description

Difference 1-2 (O3), Observation #2

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.73 sofie B_Det_V06

Description

Difference 5-6 (H2O), Observation #2

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.74 sofie B_Det_V07

Description

Difference 9-10 (particle B), Observation #2

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.75 sofie B_Det_V08

Description

Difference 13-14 (CO2 B), Observation #2

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.76 sofie B_Det_V09

Description

Band 2 (O3 weak), Observation #2

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.77 sofie B_Det_V10

Description

Band 6 (H2O strong), Observation #2

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.78 sofie B_Det_V11

Description

Band 10 (particle B weak), Observation #2

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.79 sofie B_Det_V12

Description

Band 14 (CO2 B weak), Observation #2

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.80 sofie B_Det_V13

Description

Band 3 (particle A strong), Observation #2

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.81 sofie B_Det_V14

Description

Band 7 (CO2 A strong), Observation #2

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.82 sofie B_Det_V15

Description

Band 11 (CH4 strong), Observation #2

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.83 sofie B_Det_V16

Description

Band 15 (NO weak), Observation #2

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.84 sofie B_Det_V17

Description

Difference 3-4 (particle A), Observation #2

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.85 sofie B_Det_V18

Description

Difference 7-8 (CO2 A), Observation #2

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.86 sofie B_Det_V19

Description

Difference 11-12 (CH4), Observation #2

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.87 sofie B_Det_V20

Description

Difference 15-16 (NO), Observation #2

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.88 sofie B_Det_V21

Description

Band 4 (particle A weak), Observation #2

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.89 sofie B_Det_V22

Description

Band 8 (CO2 A weak), Observation #2

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.90 sofie B_Det_V23

Description

Band 12 (CH4 weak), Observation #2

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.91 sofie B_Det_V24

Description

Band 16 (NO strong), Observation #2

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.92 sofie B_PnS_DMA

Description

Control Mirror Azimuth, Observation #2

Data Type

16 bits, signed integer, engineering units = any.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	0.03125
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.93 sofie B_PnS_DME

Description

Control Mirror Elevation, Observation #2

Data Type

16 bits, signed integer, engineering units = any.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	0.03125
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.94 sofie B_SMA_AMA

Description

Actual Mirror Azimuth, Observation #2

Data Type

16 bits, signed integer, engineering units = dn.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	1
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.95 sofie B_SMA_AME

Description

Actual Mirror Elevation, Observation #2

Data Type

16 bits, signed integer, engineering units = dn.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	1
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.96 sofie B_Sum_C01

Description
Center Sum 1, Observation #2

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.97 sofie B_Sum_C02

Description
Center Sum 2, Observation #2

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.98 sofie B_Sum_C03

Description
Center Sum 3, Observation #2

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.99 sofie B_Sum_C04

Description
Center Sum 4, Observation #2

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.100 sofie B_Sum_C05

Description
Center Sum 5, Observation #2

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.101 sofie B_Sum_C06

Description
Center Sum 6, Observation #2

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.102 sofie B_Sum_C07

Description
Center Sum 7, Observation #2

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.103 sofie B_Sum_HX01

Description
High X Sum 1, Observation #2

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.104 sofie B_Sum_HX02

Description
High X Sum 2, Observation #2

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.105 sofie B_Sum_HX03

Description
High X Sum 3, Observation #2

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.106 sofie B_Sum_HX04

Description
High X Sum 4, Observation #2

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.107 sofie B_Sum_HX05

Description
High X Sum 5, Observation #2

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.108 sofie B_Sum_HX06

Description
High X Sum 6, Observation #2

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.109 sofie B_Sum_HX07

Description
High X Sum 7, Observation #2

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.110 sofie B_Sum_HY01

Description
High Y Sum 1, Observation #2

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.111 sofie B_Sum_HY02

Description
High Y Sum 2, Observation #2

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.112 sofie B_Sum_HY03

Description
High Y Sum 3, Observation #2

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.113 sofie B_Sum_HY04

Description
High Y Sum 4, Observation #2

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.114 sofie B_Sum_HY05

Description
High Y Sum 5, Observation #2

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.115 sofie B_Sum_LX01

Description
Low X Sum 1, Observation #2

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.116 sofie B_Sum_LX02

Description
Low X Sum 2, Observation #2

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.117 sofie B_Sum_LX03

Description
Low X Sum 3, Observation #2

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.118 sofie B_Sum_LX04

Description
Low X Sum 4, Observation #2

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.119 sofie B_Sum_LX05

Description
Low X Sum 5, Observation #2

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.120 sofie B_Sum_LX06

Description
Low X Sum 6, Observation #2

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.121 sofie B_Sum_LX07

Description
Low X Sum 7, Observation #2

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.122 sofie B_Sum_LY01

Description
Low Y Sum 1, Observation #2

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.123 sofie B_Sum_LY02

Description
Low Y Sum 2, Observation #2

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.124 sofie B_Sum_LY03

Description
Low Y Sum 3, Observation #2

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.125 sofie B_Sum_LY04

Description
Low Y Sum 4, Observation #2

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.126 sofie B_Sum_LY05

Description
Low Y Sum 5, Observation #2

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.127 sofie B_TIME_Det

Description
Timestamp, Detector data, Observation #2

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.128 sofie B_TIME_Pix

Description
Timestamp, Pixels, Observation #2

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.129 sofie B_TIME_PnS

Description
Time stamp, Pointing and Stabilization, Observation #2

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.130 sofie B_TIME_TkA

Description
Timestamp, Tracking, Observation #2

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.131 sofie B_TkA_HiX

Description
High X FPA Coordinates, Observation #2

Data Type
16 bits, signed integer, engineering units = any.

Measurement Source
sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	0.03125
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.132 sofie B_TkA_HiY

Description

High Y FPA Coordinates, Observation #2

Data Type

16 bits, signed integer, engineering units = any.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	0.03125
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.133 sofie B_TkA_LwX

Description

Low X FPA Coordinates, Observation #2

Data Type

16 bits, signed integer, engineering units = any.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	0.03125
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.134 sofie B_TkA_LwY

Description

Low Y FPA Coordinates, Observation #2

Data Type

16 bits, signed integer, engineering units = any.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	0.03125
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.135 sofie C_Det_V01

Description

Band 1 (O3 strong), Observation #3

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.136 sofie C_Det_V02

Description

Band 5 (H2O weak), Observation #3

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.137 sofie C_Det_V03

Description

Band 9 (particle B strong), Observation #3

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.138 sofie C_Det_V04

Description

Band 13 (CO2 B strong), Observation #3

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.139 sofie C_Det_V05

Description

Difference 1-2 (O3), Observation #3

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.140 sofie C_Det_V06

Description

Difference 5-6 (H2O), Observation #3

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.141 sofie C_Det_V07

Description

Difference 9-10 (particle B), Observation #3

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.142 sofie C_Det_V08

Description

Difference 13-14 (CO2 B), Observation #3

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.143 sofie C_Det_V09

Description

Band 2 (O3 weak), Observation #3

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.144 sofie C_Det_V10

Description

Band 6 (H2O strong), Observation #3

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.145 sofie C_Det_V11

Description

Band 10 (particle B weak), Observation #3

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.146 sofie C_Det_V12

Description

Band 14 (CO2 B weak), Observation #3

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.147 sofie C_Det_V13

Description

Band 3 (particle A strong), Observation #3

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.148 sofie C_Det_V14

Description

Band 7 (CO2 A strong), Observation #3

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.149 sofie C_Det_V15

Description

Band 11 (CH4 strong), Observation #3

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.150 sofie C_Det_V16

Description

Band 15 (NO weak), Observation #3

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.151 sofie C_Det_V17

Description

Difference 3-4 (particle A), Observation #3

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.152 sofie C_Det_V18

Description

Difference 7-8 (CO2 A), Observation #3

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.153 sofie C_Det_V19

Description

Difference 11-12 (CH4), Observation #3

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.154 sofie C_Det_V20

Description

Difference 15-16 (NO), Observation #3

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.155 sofie C_Det_V21

Description

Band 4 (particle A weak), Observation #3

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.156 sofie C_Det_V22

Description

Band 8 (CO2 A weak), Observation #3

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.157 sofie C_Det_V23

Description

Band 12 (CH4 weak), Observation #3

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.158 sofie C_Det_V24

Description

Band 16 (NO strong), Observation #3

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.159 sofie C_PnS_DMA

Description

Control Mirror Azimuth, Observation #3

Data Type

16 bits, signed integer, engineering units = dn.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	1
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.160 sofie C_PnS_DME

Description

Control Mirror Elevation, Observation #3

Data Type

16 bits, signed integer, engineering units = dn.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	1
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.161 sofie C_SMA_AMA

Description

Actual Mirror Azimuth, Observation #3

Data Type

16 bits, signed integer, engineering units = dn.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	1
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.162 sofie C_SMA_AME

Description

Actual Mirror Elevation, Observation #3

Data Type

16 bits, signed integer, engineering units = dn.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	1
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.163 sofie C_Sum_C01

Description
Center Sum 1, Observation #3

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.164 sofie C_Sum_C02

Description
Center Sum 2, Observation #3

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.165 sofie C_Sum_C03

Description
Center Sum 3, Observation #3

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.166 sofie C_Sum_C04

Description
Center Sum 4, Observation #3

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.167 sofie C_Sum_C05

Description
Center Sum 5, Observation #3

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.168 sofie C_Sum_C06

Description
Center Sum 6, Observation #3

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.169 sofie C_Sum_C07

Description
Center Sum 7, Observation #3

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.170 sofie C_Sum_HX01

Description
High X Sum 1, Observation #3

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.171 sofie C_Sum_HX02

Description
High X Sum 2, Observation #3

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.172 sofie C_Sum_HX03

Description
High X Sum 3, Observation #3

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.173 sofie C_Sum_HX04

Description
High X Sum 4, Observation #3

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.174 sofie C_Sum_HX05

Description
High X Sum 5, Observation #3

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.175 sofie C_Sum_HX06

Description
High X Sum 6, Observation #3

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.176 sofie C_Sum_HX07

Description
High X Sum 7, Observation #3

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.177 sofie C_Sum_HY01

Description
High Y Sum 1, Observation #3

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.178 sofie C_Sum_HY02

Description
High Y Sum 2, Observation #3

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.179 sofie C_Sum_HY03

Description
High Y Sum 3, Observation #3

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.180 sofie C_Sum_HY04

Description
High Y Sum 4, Observation #3

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.181 sofie C_Sum_HY05

Description
High Y Sum 5, Observation #3

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.182 sofie C_Sum_LX01

Description
Low X Sum 1, Observation #3

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.183 sofie C_Sum_LX02

Description
Low X Sum 2, Observation #3

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.184 sofie C_Sum_LX03

Description
Low X Sum 3, Observation #3

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.185 sofie C_Sum_LX04

Description
Low X Sum 4, Observation #3

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.186 sofie C_Sum_LX05

Description
Low X Sum 5, Observation #3

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.187 sofie C_Sum_LX06

Description
Low X Sum 6, Observation #3

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.188 sofie C_Sum_LX07

Description
Low X Sum 7, Observation #3

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.189 sofie C_Sum_LY01

Description
Low Y Sum 1, Observation #3

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.190 sofie C_Sum_LY02

Description
Low Y Sum 2, Observation #3

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.191 sofie C_Sum_LY03

Description
Low Y Sum 3, Observation #3

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.192 sofie C_Sum_LY04

Description
Low Y Sum 4, Observation #3

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.193 sofie C_Sum_LY05

Description
Low Y Sum 5, Observation #3

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.194 sofie C_TIME_Det

Description
Timestamp, Detector data, Observation #3

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.195 sofie C_TIME_Pix

Description
Timestamp, Pixels, Observation #3

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.196 sofie C_TIME_PnS

Description

Time stamp, Pointing and Stabilization, Observation #3

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Telemetry Source Packets

sofie sci (545)

E.197 sofie C_TIME_TkA

Description

Timestamp, Tracking, Observation #3

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	1
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.198 sofie C_TkA_HiX

Description

High X FPA Coordinates, Observation #3

Data Type

16 bits, signed integer, engineering units = any.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	0.03125
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.199 sofie C_TkA_HiY

Description

High Y FPA Coordinates, Observation #3

Data Type

16 bits, signed integer, engineering units = any.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	0.03125
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.200 sofie C_TkA_LwX

Description

Low X FPA Coordinates, Observation #3

Data Type

16 bits, signed integer, engineering units = any.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	0.03125
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.201 sofie C_TkA_LwY

Description

Low Y FPA Coordinates, Observation #3

Data Type

16 bits, signed integer, engineering units = any.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	0.03125
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.202 sofie D_Det_V01

Description

Band 1 (O3 strong), Observation #4

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.203 sofie D_Det_V02

Description

Band 5 (H2O weak), Observation #4

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.204 sofie D_Det_V03

Description

Band 9 (particle B strong), Observation #4

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.205 sofie D_Det_V04

Description

Band 13 (CO2 B strong), Observation #4

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.206 sofie D_Det_V05

Description

Difference 1-2 (O3), Observation #4

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.207 sofie D_Det_V06

Description

Difference 5-6 (H2O), Observation #4

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.208 sofie D_Det_V07

Description

Difference 9-10 (particle B), Observation #4

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.209 sofie D_Det_V08

Description

Difference 13-14 (CO2 B), Observation #4

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.210 sofie D_Det_V09

Description

Band 2 (O3 weak), Observation #4

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.211 sofie D_Det_V10

Description

Band 6 (H2O strong), Observation #4

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.212 sofie D_Det_V11

Description

Band 10 (particle B weak), Observation #4

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.213 sofie D_Det_V12

Description

Band 14 (CO2 B weak), Observation #4

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.214 sofie D_Det_V13

Description

Band 3 (particle A strong), Observation #4

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.215 sofie D_Det_V14

Description

Band 7 (CO2 A strong), Observation #4

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.216 sofie D_Det_V15

Description

Band 11 (CH4 strong), Observation #4

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.217 sofie D_Det_V16

Description

Band 15 (NO weak), Observation #4

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.218 sofie D_Det_V17

Description

Difference 3-4 (particle A), Observation #4

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.219 sofie D_Det_V18

Description

Difference 7-8 (CO2 A), Observation #4

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.220 sofie D_Det_V19

Description

Difference 11-12 (CH4), Observation #4

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.221 sofie D_Det_V20

Description

Difference 15-16 (NO), Observation #4

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.222 sofie D_Det_V21

Description

Band 4 (particle A weak), Observation #4

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.223 sofie D_Det_V22

Description

Band 8 (CO2 A weak), Observation #4

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.224 sofie D_Det_V23

Description

Band 12 (CH4 weak), Observation #4

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.225 sofie D_Det_V24

Description

Band 16 (NO strong), Observation #4

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.226 sofie D_PnS_DMA

Description

Control Mirror Azimuth, Observation #4

Data Type

16 bits, signed integer, engineering units = dn.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	1
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.227 sofie D_PnS_DME

Description

Control Mirror Elevation, Observation #4

Data Type

16 bits, signed integer, engineering units = dn.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	1
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.228 sofie D_SMA_AMA

Description

Actual Mirror Azimuth, Observation #4

Data Type

16 bits, signed integer, engineering units = dn.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	1
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.229 sofie D_SMA_AME

Description

Actual Mirror Elevation, Observation #4

Data Type

16 bits, signed integer, engineering units = any.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	0.03125
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.230 sofie D_Sum_C01

Description

Center Sum 1, Observation #4

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Telemetry Source Packets

sofie sci (545)

E.231 sofie D_Sum_C02

Description

Center Sum 2, Observation #4

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Telemetry Source Packets

sofie sci (545)

E.232 sofie D_Sum_C03

Description
Center Sum 3, Observation #4

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.233 sofie D_Sum_C04

Description
Center Sum 4, Observation #4

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.234 sofie D_Sum_C05

Description
Center Sum 5, Observation #4

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.235 sofie D_Sum_C06

Description
Center Sum 6, Observation #4

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.236 sofie D_Sum_C07

Description
Center Sum 7, Observation #4

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.237 sofie D_Sum_HX01

Description
High X Sum 1, Observation #4

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.238 sofie D_Sum_HX02

Description
High X Sum 2, Observation #4

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.239 sofie D_Sum_HX03

Description
High X Sum 3, Observation #4

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.240 sofie D_Sum_HX04

Description
High X Sum 4, Observation #4

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.241 sofie D_Sum_HX05

Description
High X Sum 5, Observation #4

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.242 sofie D_Sum_HX06

Description
High X Sum 6, Observation #4

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.243 sofie D_Sum_HX07

Description
High X Sum 7, Observation #4

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.244 sofie D_Sum_HY01

Description
High Y Sum 1, Observation #4

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.245 sofie D_Sum_HY02

Description
High Y Sum 2, Observation #4

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.246 sofie D_Sum_HY03

Description
High Y Sum 3, Observation #4

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.247 sofie D_Sum_HY04

Description
High Y Sum 4, Observation #4

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.248 sofie D_Sum_HY05

Description
High Y Sum 5, Observation #4

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.249 sofie D_Sum_LX01

Description
Low X Sum 1, Observation #4

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.250 sofie D_Sum_LX02

Description
Low X Sum 2, Observation #4

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.251 sofie D_Sum_LX03

Description
Low X Sum 3, Observation #4

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.252 sofie D_Sum_LX04

Description
Low X Sum 4, Observation #4

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.253 sofie D_Sum_LX05

Description
Low X Sum 5, Observation #4

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.254 sofie D_Sum_LX06

Description
Low X Sum 6, Observation #4

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.255 sofie D_Sum_LX07

Description
Low X Sum 7, Observation #4

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.256 sofie D_Sum_LY01

Description
Low Y Sum 1, Observation #4

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.257 sofie D_Sum_LY02

Description
Low Y Sum 2, Observation #4

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.258 sofie D_Sum_LY03

Description
Low Y Sum 3, Observation #4

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.259 sofie D_Sum_LY04

Description
Low Y Sum 4, Observation #4

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.260 sofie D_Sum_LY05

Description
Low Y Sum 5, Observation #4

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.261 sofie D_TIME_Det

Description
Timestamp, Detector data, Observation #4

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.262 sofie D_TIME_Pix

Description
Timestamp, Pixels, Observation #4

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.263 sofie D_TIME_PnS

Description
Time stamp, Pointing and Stabilization, Observation #4

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.264 sofie D_TIME_TkA

Description
Timestamp, Tracking, Observation #4

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.265 sofie D_TkA_HiX

Description

High X FPA Coordinates, Observation #4

Data Type

16 bits, signed integer, engineering units = any.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	0.03125
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.266 sofie D_TkA_HiY

Description

High Y FPA Coordinates, Observation #4

Data Type

16 bits, signed integer, engineering units = any.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	0.03125
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.267 sofie D_TkA_LwX

Description

Low X FPA Coordinates, Observation #4

Data Type

16 bits, signed integer, engineering units = any.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	0.03125
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.268 sofie D_TkA_LwY

Description

Low Y FPA Coordinates, Observation #4

Data Type

16 bits, signed integer, engineering units = any.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	0.03125
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.269 sofie E_Det_V01

Description

Band 1 (O3 strong), Observation #5

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.270 sofie E_Det_V02

Description

Band 5 (H2O weak), Observation #5

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.271 sofie E_Det_V03

Description

Band 9 (particle B strong), Observation #5

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.272 sofie E_Det_V04

Description

Band 13 (CO2 B strong), Observation #5

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.273 sofie E_Det_V05

Description

Difference 1-2 (O3), Observation #5

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.274 sofie E_Det_V06

Description

Difference 5-6 (H2O), Observation #5

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.275 sofie E_Det_V07

Description

Difference 9-10 (particle B), Observation #5

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.276 sofie E_Det_V08

Description

Difference 13-14 (CO2 B), Observation #5

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.277 sofie E_Det_V09

Description

Band 2 (O3 weak), Observation #5

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.278 sofie E_Det_V10

Description

Band 6 (H2O strong), Observation #5

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.279 sofie E_Det_V11

Description

Band 10 (particle B weak), Observation #5

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.280 sofie E_Det_V12

Description

Band 14 (CO2 B weak), Observation #5

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.281 sofie E_Det_V13

Description

Band 3 (particle A strong), Observation #5

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.282 sofie E_Det_V14

Description

Band 7 (CO2 A strong), Observation #5

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.283 sofie E_Det_V15

Description

Band 11 (CH4 strong), Observation #5

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.284 sofie E_Det_V16

Description

Band 15 (NO weak), Observation #5

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.285 sofie E_Det_V17

Description

Difference 3-4 (particle A), Observation #5

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.286 sofie E_Det_V18

Description

Difference 7-8 (CO2 A), Observation #5

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.287 sofie E_Det_V19

Description

Difference 11-12 (CH4), Observation #5

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.288 sofie E_Det_V20

Description

Difference 15-16 (NO), Observation #5

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.289 sofie E_Det_V21

Description

Band 4 (particle A weak), Observation #5

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.290 sofie E_Det_V22

Description

Band 8 (CO2 A weak), Observation #5

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.291 sofie E_Det_V23

Description

Band 12 (CH4 weak), Observation #5

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.292 sofie E_Det_V24

Description

Band 16 (NO strong), Observation #5

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.293 sofie E_PnS_DMA

Description

Control Mirror Azimuth, Observation #5

Data Type

16 bits, signed integer, engineering units = dn.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	1
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.294 sofie E_PnS_DME

Description

Control Mirror Elevation, Observation #5

Data Type

16 bits, signed integer, engineering units = dn.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	1
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.295 sofie E_SMA_AMA

Description

Actual Mirror Azimuth, Observation #5

Data Type

16 bits, signed integer, engineering units = dn.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	1
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.296 sofie E_SMA_AME

Description

Actual Mirror Elevation, Observation #5

Data Type

16 bits, signed integer, engineering units = dn.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	1
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.297 sofie E_Sum_C01

Description

Center Sum 1, Observation #5

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Telemetry Source Packets

sofie sci (545)

E.298 sofie E_Sum_C02

Description

Center Sum 2, Observation #5

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Telemetry Source Packets

sofie sci (545)

E.299 sofie E_Sum_C03

Description
Center Sum 3, Observation #5

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.300 sofie E_Sum_C04

Description
Center Sum 4, Observation #5

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.301 sofie E_Sum_C05

Description
Center Sum 5, Observation #5

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.302 sofie E_Sum_C06

Description
Center Sum 6, Observation #5

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.303 sofie E_Sum_C07

Description
Center Sum 7, Observation #5

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.304 sofie E_Sum_HX01

Description
High X Sum 1, Observation #5

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.305 sofie E_Sum_HX02

Description
High X Sum 2, Observation #5

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.306 sofie E_Sum_HX03

Description
High X Sum 3, Observation #5

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.307 sofie E_Sum_HX04

Description
High X Sum 4, Observation #5

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.308 sofie E_Sum_HX05

Description
High X Sum 5, Observation #5

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.309 sofie E_Sum_HX06

Description
High X Sum 6, Observation #5

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.310 sofie E_Sum_HX07

Description
High X Sum 7, Observation #5

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.311 sofie E_Sum_HY01

Description
High Y Sum 1, Observation #5

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.312 sofie E_Sum_HY02

Description
High Y Sum 2, Observation #5

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.313 sofie E_Sum_HY03

Description
High Y Sum 3, Observation #5

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.314 sofie E_Sum_HY04

Description
High Y Sum 4, Observation #5

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.315 sofie E_Sum_HY05

Description
High Y Sum 5, Observation #5

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.316 sofie E_Sum_LX01

Description
Low X Sum 1, Observation #5

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.317 sofie E_Sum_LX02

Description
Low X Sum 2, Observation #5

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.318 sofie E_Sum_LX03

Description
Low X Sum 3, Observation #5

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.319 sofie E_Sum_LX04

Description
Low X Sum 4, Observation #5

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.320 sofie E_Sum_LX05

Description
Low X Sum 5, Observation #5

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.321 sofie E_Sum_LX06

Description
Low X Sum 6, Observation #5

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.322 sofie E_Sum_LX07

Description
Low X Sum 7, Observation #5

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.323 sofie E_Sum_LY01

Description
Low Y Sum 1, Observation #5

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.324 sofie E_Sum_LY02

Description
Low Y Sum 2, Observation #5

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.325 sofie E_Sum_LY03

Description
Low Y Sum 3, Observation #5

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.326 sofie E_Sum_LY04

Description
Low Y Sum 4, Observation #5

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.327 sofie E_Sum_LY05

Description
Low Y Sum 5, Observation #5

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.328 sofie E_TIME_Det

Description
Timestamp, Detector data, Observation #5

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.329 sofie E_TIME_Pix

Description
Timestamp, Pixels, Observation #5

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.330 sofie E_TIME_PnS

Description
Time stamp, Pointing and Stabilization, Observation #5

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.331 sofie E_TIME_TkA

Description
Timestamp, Tracking, Observation #5

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.332 sofie E_TkA_HiX

Description

High X FPA Coordinates, Observation #5

Data Type

16 bits, signed integer, engineering units = any.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	0.03125
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.333 sofie E_TkA_HiY

Description

High Y FPA Coordinates, Observation #5

Data Type

16 bits, signed integer, engineering units = any.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	0.03125
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.334 sofie E_TkA_LwX

Description

Low X FPA Coordinates, Observation #5

Data Type

16 bits, signed integer, engineering units = any.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	0.03125
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.335 sofie E_TkA_LwY

Description

Low Y FPA Coordinates, Observation #5

Data Type

16 bits, signed integer, engineering units = any.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	0.03125
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.336 sofie F_Det_V01

Description

Band 1 (O3 strong), Observation #6

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.337 sofie F_Det_V02

Description

Band 5 (H2O weak), Observation #6

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.338 sofie F_Det_V03

Description

Band 9 (particle B strong), Observation #6

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.339 sofie F_Det_V04

Description

Band 13 (CO2 B strong), Observation #6

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.340 sofie F_Det_V05

Description

Difference 1-2 (O3), Observation #6

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.341 sofie F_Det_V06

Description

Difference 5-6 (H2O), Observation #6

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.342 sofie F_Det_V07

Description

Difference 9-10 (particle B), Observation #6

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.343 sofie F_Det_V08

Description

Difference 13-14 (CO2 B), Observation #6

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.344 sofie F_Det_V09

Description

Band 2 (O3 weak), Observation #6

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.345 sofie F_Det_V10

Description

Band 6 (H2O strong), Observation #6

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.346 sofie F_Det_V11

Description

Band 10 (particle B weak), Observation #6

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.347 sofie F_Det_V12

Description

Band 14 (CO2 B weak), Observation #6

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.348 sofie F_Det_V13

Description

Band 3 (particle A strong), Observation #6

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.349 sofie F_Det_V14

Description

Band 7 (CO2 A strong), Observation #6

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.350 sofie F_Det_V15

Description

Band 11 (CH4 strong), Observation #6

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.351 sofie F_Det_V16

Description

Band 15 (NO weak), Observation #6

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.352 sofie F_Det_V17

Description

Difference 3-4 (particle A), Observation #6

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.353 sofie F_Det_V18

Description

Difference 7-8 (CO2 A), Observation #6

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.354 sofie F_Det_V19

Description

Difference 11-12 (CH4), Observation #6

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.355 sofie F_Det_V20

Description

Difference 15-16 (NO), Observation #6

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.356 sofie F_Det_V21

Description

Band 4 (particle A weak), Observation #6

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.357 sofie F_Det_V22

Description

Band 8 (CO2 A weak), Observation #6

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.358 sofie F_Det_V23

Description

Band 12 (CH4 weak), Observation #6

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.359 sofie F_Det_V24

Description

Band 16 (NO strong), Observation #6

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.360 sofie F_PnS_DMA

Description

Control Mirror Azimuth, Observation #6

Data Type

16 bits, signed integer, engineering units = dn.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	1
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.361 sofie F_PnS_DME

Description

Control Mirror Elevation, Observation #6

Data Type

16 bits, signed integer, engineering units = dn.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	1
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.362 sofie F_SMA_AMA

Description

Actual Mirror Azimuth, Observation #6

Data Type

16 bits, signed integer, engineering units = dn.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	1
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.363 sofie F_SMA_AME

Description

Actual Mirror Elevation, Observation #6

Data Type

16 bits, signed integer, engineering units = dn.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	1
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.364 sofie F_Sum_C01

Description

Center Sum 1, Observation #6

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Telemetry Source Packets

sofie sci (545)

E.365 sofie F_Sum_C02

Description

Center Sum 2, Observation #6

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Telemetry Source Packets

sofie sci (545)

E.366 sofie F_Sum_C03

Description
Center Sum 3, Observation #6

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.367 sofie F_Sum_C04

Description
Center Sum 4, Observation #6

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.368 sofie F_Sum_C05

Description
Center Sum 5, Observation #6

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.369 sofie F_Sum_C06

Description
Center Sum 6, Observation #6

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.370 sofie F_Sum_C07

Description
Center Sum 7, Observation #6

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.371 sofie F_Sum_HX01

Description
High X Sum 1, Observation #6

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.372 sofie F_Sum_HX02

Description
High X Sum 2, Observation #6

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.373 sofie F_Sum_HX03

Description
High X Sum 3, Observation #6

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.374 sofie F_Sum_HX04

Description
High X Sum 4, Observation #6

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.375 sofie F_Sum_HX05

Description
High X Sum 5, Observation #6

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.376 sofie F_Sum_HX06

Description
High X Sum 6, Observation #6

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.377 sofie F_Sum_HX07

Description
High X Sum 7, Observation #6

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.378 sofie F_Sum_HY01

Description
High Y Sum 1, Observation #6

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.379 sofie F_Sum_HY02

Description
High Y Sum 2, Observation #6

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.380 sofie F_Sum_HY03

Description
High Y Sum 3, Observation #6

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.381 sofie F_Sum_HY04

Description
High Y Sum 4, Observation #6

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.382 sofie F_Sum_HY05

Description
High Y Sum 5, Observation #6

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.383 sofie F_Sum_LX01

Description
Low X Sum 1, Observation #6

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.384 sofie F_Sum_LX02

Description
Low X Sum 2, Observation #6

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.385 sofie F_Sum_LX03

Description
Low X Sum 3, Observation #6

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.386 sofie F_Sum_LX04

Description
Low X Sum 4, Observation #6

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.387 sofie F_Sum_LX05

Description
Low X Sum 5, Observation #6

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.388 sofie F_Sum_LX06

Description
Low X Sum 6, Observation #6

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.389 sofie F_Sum_LX07

Description
Low X Sum 7, Observation #6

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.390 sofie F_Sum_LY01

Description
Low Y Sum 1, Observation #6

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.391 sofie F_Sum_LY02

Description
Low Y Sum 2, Observation #6

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.392 sofie F_Sum_LY03

Description
Low Y Sum 3, Observation #6

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.393 sofie F_Sum_LY04

Description
Low Y Sum 4, Observation #6

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.394 sofie F_Sum_LY05

Description
Low Y Sum 5, Observation #6

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.395 sofie F_TIME_Det

Description
Timestamp, Detector data, Observation #6

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.396 sofie F_TIME_Pix

Description
Timestamp, Pixels, Observation #6

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.397 sofie F_TIME_PnS

Description
Time stamp, Pointing and Stabilization, Observation #6

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.398 sofie F_TIME_TkA

Description
Timestamp, Tracking, Observation #6

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.399 sofie F_TkA_HiX

Description

High X FPA Coordinates, Observation #6

Data Type

16 bits, signed integer, engineering units = any.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	0.03125
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.400 sofie F_TkA_HiY

Description

High Y FPA Coordinates, Observation #6

Data Type

16 bits, signed integer, engineering units = any.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	0.03125
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.401 sofie F_TkA_LwX

Description

Low X FPA Coordinates, Observation #6

Data Type

16 bits, signed integer, engineering units = any.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	0.03125
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.402 sofie F_TkA_LwY

Description

Low Y FPA Coordinates, Observation #6

Data Type

16 bits, signed integer, engineering units = any.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	0.03125
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.403 sofie G_Det_V01

Description

Band 1 (O3 strong), Observation #7

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.404 sofie G_Det_V02

Description

Band 5 (H2O weak), Observation #7

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.405 sofie G_Det_V03

Description

Band 9 (particle B strong), Observation #7

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.406 sofie G_Det_V04

Description

Band 13 (CO2 B strong), Observation #7

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.407 sofie G_Det_V05

Description

Difference 1-2 (O3), Observation #7

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.408 sofie G_Det_V06

Description

Difference 5-6 (H2O), Observation #7

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.409 sofie G_Det_V07

Description

Difference 9-10 (particle B), Observation #7

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.410 sofie G_Det_V08

Description

Difference 13-14 (CO2 B), Observation #7

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.411 sofie G_Det_V09

Description

Band 2 (O3 weak), Observation #7

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.412 sofie G_Det_V10

Description

Band 6 (H2O strong), Observation #7

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.413 sofie G_Det_V11

Description

Band 10 (particle B weak), Observation #7

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.414 sofie G_Det_V12

Description

Band 14 (CO2 B weak), Observation #7

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.415 sofie G_Det_V13

Description

Band 3 (particle A strong), Observation #7

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.416 sofie G_Det_V14

Description

Band 7 (CO2 A strong), Observation #7

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.417 sofie G_Det_V15

Description

Band 11 (CH4 strong), Observation #7

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.418 sofie G_Det_V16

Description

Band 15 (NO weak), Observation #7

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.419 sofie G_Det_V17

Description

Difference 3-4 (particle A), Observation #7

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.420 sofie G_Det_V18

Description

Difference 7-8 (CO2 A), Observation #7

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.421 sofie G_Det_V19

Description

Difference 11-12 (CH4), Observation #7

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.422 sofie G_Det_V20

Description

Difference 15-16 (NO), Observation #7

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.423 sofie G_Det_V21

Description

Band 4 (particle A weak), Observation #7

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.424 sofie G_Det_V22

Description

Band 8 (CO2 A weak), Observation #7

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.425 sofie G_Det_V23

Description

Band 12 (CH4 weak), Observation #7

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.426 sofie G_Det_V24

Description

Band 16 (NO strong), Observation #7

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	9.15527270990424e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.427 sofie G_PnS_DMA

Description

Control Mirror Azimuth, Observation #7

Data Type

16 bits, signed integer, engineering units = dn.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	1
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.428 sofie G_PnS_DME

Description

Control Mirror Elevation, Observation #7

Data Type

16 bits, signed integer, engineering units = dn.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	1
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.429 sofie G_SMA_AMA

Description

Actual Mirror Azimuth, Observation #7

Data Type

16 bits, signed integer, engineering units = dn.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	1
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.430 sofie G_SMA_AME

Description

Actual Mirror Elevation, Observation #7

Data Type

16 bits, signed integer, engineering units = dn.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	1
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.431 sofie G_Sum_C01

Description

Center Sum 1, Observation #7

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Telemetry Source Packets

sofie sci (545)

E.432 sofie G_Sum_C02

Description

Center Sum 2, Observation #7

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Telemetry Source Packets

sofie sci (545)

E.433 sofie G_Sum_C03

Description
Center Sum 3, Observation #7

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.434 sofie G_Sum_C04

Description
Center Sum 4, Observation #7

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.435 sofie G_Sum_C05

Description
Center Sum 5, Observation #7

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.436 sofie G_Sum_C06

Description
Center Sum 6, Observation #7

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.437 sofie G_Sum_C07

Description
Center Sum 7, Observation #7

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.438 sofie G_Sum_HX01

Description
High X Sum 1, Observation #7

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.439 sofie G_Sum_HX02

Description
High X Sum 2, Observation #7

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.440 sofie G_Sum_HX03

Description
High X Sum 3, Observation #7

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.441 sofie G_Sum_HX04

Description
High X Sum 4, Observation #7

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.442 sofie G_Sum_HX05

Description
High X Sum 5, Observation #7

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.443 sofie G_Sum_HX06

Description
High X Sum 6, Observation #7

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.444 sofie G_Sum_HX07

Description
High X Sum 7, Observation #7

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.445 sofie G_Sum_HY01

Description
High Y Sum 1, Observation #7

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.446 sofie G_Sum_HY02

Description
High Y Sum 2, Observation #7

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.447 sofie G_Sum_HY03

Description
High Y Sum 3, Observation #7

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.448 sofie G_Sum_HY04

Description
High Y Sum 4, Observation #7

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.449 sofie G_Sum_HY05

Description
High Y Sum 5, Observation #7

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.450 sofie G_Sum_LX01

Description
Low X Sum 1, Observation #7

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.451 sofie G_Sum_LX02

Description
Low X Sum 2, Observation #7

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.452 sofie G_Sum_LX03

Description
Low X Sum 3, Observation #7

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.453 sofie G_Sum_LX04

Description
Low X Sum 4, Observation #7

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.454 sofie G_Sum_LX05

Description
Low X Sum 5, Observation #7

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.455 sofie G_Sum_LX06

Description
Low X Sum 6, Observation #7

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.456 sofie G_Sum_LX07

Description
Low X Sum 7, Observation #7

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.457 sofie G_Sum_LY01

Description
Low Y Sum 1, Observation #7

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.458 sofie G_Sum_LY02

Description
Low Y Sum 2, Observation #7

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.459 sofie G_Sum_LY03

Description
Low Y Sum 3, Observation #7

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.460 sofie G_Sum_LY04

Description
Low Y Sum 4, Observation #7

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.461 sofie G_Sum_LY05

Description
Low Y Sum 5, Observation #7

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.462 sofie G_TIME_Det

Description
Timestamp, Detector data, Observation #7

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.463 sofie G_TIME_Pix

Description
Timestamp, Pixels, Observation #7

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.464 sofie G_TIME_PnS

Description
Time stamp, Pointing and Stabilization, Observation #7

Data Type
16 bits, signed integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.465 sofie G_TIME_TkA

Description
Timestamp, Tracking, Observation #7

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.466 sofie G_TkA_HiX

Description

High X FPA Coordinates, Observation #7

Data Type

16 bits, signed integer, engineering units = any.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	0.03125
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.467 sofie G_TkA_HiY

Description

High Y FPA Coordinates, Observation #7

Data Type

16 bits, signed integer, engineering units = any.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	0.03125
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.468 sofie G_TkA_LwX

Description

Low X FPA Coordinates, Observation #7

Data Type

16 bits, signed integer, engineering units = any.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	0.03125
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.469 sofie G_TkA_LwY

Description

Low Y FPA Coordinates, Observation #7

Data Type

16 bits, signed integer, engineering units = any.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	0
c1	0.03125
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie sci (545)

E.470 sofie OD_address

Description

bank select OD bits for memory address

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Telemetry Source Packets

sofie test_dump (560)

E.471 sofie atten_setting_1

Description

Attenuator setting #1

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	65535
yellow high	3413
yellow low	3411
red low	-65535
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.472 sofie atten_setting_10

Description

Attenuator setting #10

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	65535
yellow high	40277
yellow low	40275
red low	-65535
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.473 sofie atten_setting_11

Description

Attenuator setting #11

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	65535
yellow high	52565
yellow low	52563
red low	-65535
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.474 sofie atten_setting_12

Description

Attenuator setting #12

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	65535
yellow high	56661
yellow low	56659
red low	-65535
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.475 sofie atten_setting_13

Description

Attenuator setting #13

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	65535
yellow high	44373
yellow low	44371
red low	-65535
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.476 sofie atten_setting_14

Description

Attenuator setting #14

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	65535
yellow high	48469
yellow low	48467
red low	-65535
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.477 sofie atten_setting_15

Description

Attenuator setting #15

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	65535
yellow high	60757
yellow low	60755
red low	-65535
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.478 sofie atten_setting_16

Description

Attenuator setting #16

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	65535
yellow high	64853
yellow low	64851
red low	-65535
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.479 sofie atten_setting_2

Description

Attenuator setting #2

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	65535
yellow high	7509
yellow low	7507
red low	-65535
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.480 sofie atten_setting_3

Description

Attenuator setting #3

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	65535
yellow high	19797
yellow low	19795
red low	-65535
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.481 sofie atten_setting_4

Description

Attenuator setting #4

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	65535
yellow high	23893
yellow low	23891
red low	-65535
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.482 sofie atten_setting_5

Description

Attenuator setting #5

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	65535
yellow high	11605
yellow low	11603
red low	-65535
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.483 sofie atten_setting_6

Description

Attenuator setting #6

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	65535
yellow high	15701
yellow low	15699
red low	-65535
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.484 sofie atten_setting_7

Description

Attenuator setting #7

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	65535
yellow high	27989
yellow low	27987
red low	-65535
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.485 sofie atten_setting_8

Description

Attenuator setting #8

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	65535
yellow high	32085
yellow low	32083
red low	-65535
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.486 sofie atten_setting_9

Description

Attenuator setting #9

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	65535
yellow high	36181
yellow low	36179
red low	-65535
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.487 sofie automat_proc_err

Description

Automation Processor errors (0x4D)

Data Type

32 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	1
yellow high	1
yellow low	-1
red low	-1
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.488 sofie cdh_EH_FR_err

Description

&DH Error Handler& Fault Response errors (0x46)

Data Type

32 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	1
yellow high	1
yellow low	-1
red low	-1
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.489 sofie cdh_I_T_err

Description

&DH Init and Task Manager errors (0x41)

Data Type

32 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	1
yellow high	1
yellow low	-1
red low	-1
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.490 sofie cdh_ST_Diag_err

Description

&DH Self-Test and Diagnostics errors (0x44)

Data Type

32 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	1
yellow high	1
yellow low	-1
red low	-1
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.491 sofie cdh_cmndexec_err

Description

&DH Command Executor errors (0x48)

Data Type

32 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	1
yellow high	1
yellow low	-1
red low	-1
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.492 sofie cdh_comm_err

Description

&DH Board Comm Handler errors (0x82)

Data Type

32 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	1
yellow high	1
yellow low	-1
red low	-1
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.493 sofie cdh_critical_err

Description

&DH critical errors (0x40)

Data Type

32 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	1
yellow high	1
yellow low	-1
red low	-1
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.494 sofie cdh_data_acq_err

Description

&DH Data Acquisition Handler errors (0x4E)

Data Type

32 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	1
yellow high	1
yellow low	-1
red low	-1
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.495 sofie cdh_queue_err

Description

&DH Queue Function errors (0x52)

Data Type

32 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	1
yellow high	1
yellow low	-1
red low	-1
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.496 sofie cdh_taskm_stat_1

Description

Interrupt count, CDH task manager status

Data Type

6 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Telemetry Source Packets

sofie system_data (556)

E.497 sofie cdh_taskm_stat_2

Description

Mode, CDH task manager status

Data Type

4 bits, discrete state, engineering units = dn.

Measurement Source

sofie

State Conversions

state	value	desirability
SAFE	1	GOOD
STANDBY	2	GOOD
SCIENCE	4	GOOD
SCIENCE_DATA	12	GOOD

Telemetry Source Packets

sofie system_data (556)

E.498 sofie cdh_taskm_stat_3

Description

Sequence, CDH task manager status

Data Type

4 bits, discrete state, engineering units = dn.

Measurement Source

sofie

State Conversions

state	value	desirability
INIT	0	GOOD
POLLING	1	GOOD
LOAD	2	GOOD
TEST1	4	GOOD
TEST2	8	GOOD

Telemetry Source Packets

sofie system_data (556)

E.499 sofie cdh_taskm_stat_4

Description

20 Hz& 1 Hz interrupt, CDH task manager status

Data Type

2 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Telemetry Source Packets

sofie system_data (556)

E.500 sofie cdh_taskm_stat_5

Description

Error, CDH task manager status

Data Type

4 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Telemetry Source Packets

sofie system_data (556)

E.501 sofie cdh_taskm_stat_6

Description

Timer, CDH task manager status

Data Type

4 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Telemetry Source Packets

sofie system_data (556)

E.502 sofie cdh_taskm_stat_7

Description

Quiet_100Hz, CDH task manager status

Data Type

4 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Telemetry Source Packets

sofie system_data (556)

E.503 sofie cdh_taskm_stat_8

Description
SSB, CDH task manager status

Data Type
2 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie system_data (556)

E.504 sofie cdh_taskm_stat_9

Description
Int_5_0, CDH task manager status

Data Type
2 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie system_data (556)

E.505 sofie checksum

Description
Science packet checksum

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.506 sofie chop_ctrl_err

Description

Chopper Control errors (0x4B)

Data Type

32 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	1
yellow high	1
yellow low	-1
red low	-1
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.507 sofie chop_health_left

Description

Chopper health left channel (ts61)

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	0
c1	4.57763671875e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	65535
yellow high	0.5
yellow low	0.200000002980232
red low	-65535
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.508 sofie chop_health_rt

Description

Chopper health right channel (ts29)

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	0
c1	4.57763671875e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	65535
yellow high	0.00999999977648258
yellow low	9.99999974737875e-05
red low	-65535
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.509 sofie cmnd_opcode

Description
Opcode of the most recent command with a single word response

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie system_data (556)

E.510 sofie cmnd_preproc_err

Description
Command Pre-Processor errors (0x43)

Data Type
32 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Limits

alarm	limit
red high	1
yellow high	1
yellow low	-1
red low	-1
delta	*none*

Telemetry Source Packets
sofie system_data (556)

E.511 sofie cmnd_response

Description
Response from the latest single word response command

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie system_data (556)

E.512 sofie cmnds_accepted

Description
&DH Commands accepted

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie system_data (556)

E.513 sofie cmnds_rejected

Description
&DH Commands rejected

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie system_data (556)

E.514 sofie codeupdate_err

Description
Code Updater errors (0x45)

Data Type
32 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Limits

alarm	limit
red high	1
yellow high	1
yellow low	-1
red low	-1
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.515 sofie curr_m12v_inst

Description

PS Current Monitor -12V_I (ps4)

Data Type

16 bits, signed integer, engineering units = a.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-0.0201991219073534
c1	8.75608384376392e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	2
yellow high	1.60000002384186
yellow low	0.150000005960464
red low	0.00999999977648258
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.516 sofie curr_m12v_sm

Description

PS Current Monitor -12V_SM (ps12)

Data Type

16 bits, signed integer, engineering units = a.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-0.00199762871488929
c1	8.40755456010811e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	3
yellow high	2
yellow low	-0.200000002980232
red low	-0.300000011920929
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.517 sofie curr_p12v_inst

Description

PS Current Monitor +12V_I (ps3)

Data Type

16 bits, signed integer, engineering units = a.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	0.0547322258353233
c1	8.7648855696898e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	2
yellow high	1.60000002384186
yellow low	0.200000002980232
red low	0.00999999977648258
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.518 sofie curr_p12v_sm

Description

PS Current Monitor +12V_SM (ps11)

Data Type

16 bits, signed integer, engineering units = a.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-0.264408826828003
c1	8.80678053363226e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	3
yellow high	2.29999995231628
yellow low	-0.200000002980232
red low	-0.300000011920929
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.519 sofie curr_p2_5v_fpga

Description

PS Current Monitor +2.5V FPGA (ps16)

Data Type

16 bits, signed integer, engineering units = a.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-0.00287073175422847
c1	1.11649678729009e-05
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	0.400000005960464
yellow high	0.300000011920929
yellow low	0.0500000007450581
red low	0.00999999977648258
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.520 sofie curr_p3_3v_tec

Description

PS Current Monitor +3.3V TEC (ps8)

Data Type

16 bits, signed integer, engineering units = a.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-0.0201891679316759
c1	0.000219782828935422
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	6
yellow high	5
yellow low	-0.300000011920929
red low	-0.400000005960464
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.521 sofie curr_p3_3v_tec2

Description

PS Current Monitor +3.3V TEC V2 (ps15)

Data Type

16 bits, signed integer, engineering units = a.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	0.124094091355801
c1	0.000220433706999756
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	6
yellow high	5
yellow low	-0.300000011920929
red low	-0.400000005960464
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.522 sofie curr_p5v

Description

PS Current Monitor +5V (ps7)

Data Type

16 bits, signed integer, engineering units = a.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	0.0566778220236301
c1	0.000220433706999756
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	3
yellow high	2.29999995231628
yellow low	0.5
red low	0.00999999977648258
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.523 sofie data_space

Description

space for data to be dumped

Data Type

7504 bits, fill, engineering units = dn.

Measurement Source

sofie

Telemetry Source Packets

sofie test_dump (560)

E.524 sofie det_ctrl_err

Description

Detector Channel Control errors (0x4A)

Data Type

32 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	1
yellow high	1
yellow low	-1
red low	-1
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.525 sofie detector_temp_1

Description

Detector 1 Temperature (dt1)

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	30.8576354980469
c1	-0.00627892790362239
c2	2.13014956784718e-07
c3	-3.79525534263681e-12
c4	3.65373352800757e-17
c5	-1.91917501523053e-22
c6	5.17010452818661e-28
c7	-5.58394209033898e-34

Limits

alarm	limit
red high	50
yellow high	45
yellow low	-46
red low	-50
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.526 sofie detector_temp_10

Description

Detector 10 Temperature (dt10)

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	30.8576354980469
c1	-0.00627892790362239
c2	2.13014956784718e-07
c3	-3.79525534263681e-12
c4	3.65373352800757e-17
c5	-1.91917501523053e-22
c6	5.17010452818661e-28
c7	-5.58394209033898e-34

Limits

alarm	limit
red high	50
yellow high	45
yellow low	-46
red low	-50
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.527 sofie detector_temp_11

Description

Detector 11 Temperature (dt11)

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	30.8576354980469
c1	-0.00627892790362239
c2	2.13014956784718e-07
c3	-3.79525534263681e-12
c4	3.65373352800757e-17
c5	-1.91917501523053e-22
c6	5.17010452818661e-28
c7	-5.58394209033898e-34

Limits

alarm	limit
red high	50
yellow high	45
yellow low	-46
red low	-50
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.528 sofie detector_temp_12

Description

Detector 12 Temperature (dt12)

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	30.8576354980469
c1	-0.00627892790362239
c2	2.13014956784718e-07
c3	-3.79525534263681e-12
c4	3.65373352800757e-17
c5	-1.91917501523053e-22
c6	5.17010452818661e-28
c7	-5.58394209033898e-34

Limits

alarm	limit
red high	50
yellow high	45
yellow low	-46
red low	-50
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.529 sofie detector_temp_13

Description

Detector 13 Temperature (dt13)

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	30.8576354980469
c1	-0.0217878799885511
c2	2.56489192906884e-06
c3	-1.58573071340484e-10
c4	5.29730254751398e-15
c5	-9.65521529370664e-20
c6	9.02560216351421e-25
c7	-3.38257320358722e-30

Limits

alarm	limit
red high	50
yellow high	45
yellow low	-71
red low	-75
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.530 sofie detector_temp_14

Description

Detector 14 Temperature (dt14)

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	30.8576354980469
c1	-0.0217878799885511
c2	2.56489192906884e-06
c3	-1.58573071340484e-10
c4	5.29730254751398e-15
c5	-9.65521529370664e-20
c6	9.02560216351421e-25
c7	-3.38257320358722e-30

Limits

alarm	limit
red high	50
yellow high	45
yellow low	-71
red low	-75
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.531 sofie detector_temp_15

Description

Detector 15 Temperature (dt15)

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	30.8576354980469
c1	-0.0217878799885511
c2	2.56489192906884e-06
c3	-1.58573071340484e-10
c4	5.29730254751398e-15
c5	-9.65521529370664e-20
c6	9.02560216351421e-25
c7	-3.38257320358722e-30

Limits

alarm	limit
red high	50
yellow high	45
yellow low	-71
red low	-75
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.532 sofie detector_temp_16

Description

Detector 16 Temperature (dt16)

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	30.8576354980469
c1	-0.0217878799885511
c2	2.56489192906884e-06
c3	-1.58573071340484e-10
c4	5.29730254751398e-15
c5	-9.65521529370664e-20
c6	9.02560216351421e-25
c7	-3.38257320358722e-30

Limits

alarm	limit
red high	50
yellow high	45
yellow low	-71
red low	-75
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.533 sofie detector_temp_2

Description

Detector 2 Temperature (dt2)

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	30.8576354980469
c1	-0.00627892790362239
c2	2.13014956784718e-07
c3	-3.79525534263681e-12
c4	3.65373352800757e-17
c5	-1.91917501523053e-22
c6	5.17010452818661e-28
c7	-5.58394209033898e-34

Limits

alarm	limit
red high	50
yellow high	45
yellow low	-46
red low	-50
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.534 sofie detector_temp_3

Description

Detector 3 Temperature (dt3)

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	30.8576354980469
c1	-0.00627892790362239
c2	2.13014956784718e-07
c3	-3.79525534263681e-12
c4	3.65373352800757e-17
c5	-1.91917501523053e-22
c6	5.17010452818661e-28
c7	-5.58394209033898e-34

Limits

alarm	limit
red high	50
yellow high	45
yellow low	-46
red low	-50
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.535 sofie detector_temp_4

Description

Detector 4 Temperature (dt4)

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	30.8576354980469
c1	-0.00627892790362239
c2	2.13014956784718e-07
c3	-3.79525534263681e-12
c4	3.65373352800757e-17
c5	-1.91917501523053e-22
c6	5.17010452818661e-28
c7	-5.58394209033898e-34

Limits

alarm	limit
red high	50
yellow high	45
yellow low	-46
red low	-50
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.536 sofie detector_temp_5

Description

Detector 5 Temperature (dt5)

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	30.8576354980469
c1	-0.00627892790362239
c2	2.13014956784718e-07
c3	-3.79525534263681e-12
c4	3.65373352800757e-17
c5	-1.91917501523053e-22
c6	5.17010452818661e-28
c7	-5.58394209033898e-34

Limits

alarm	limit
red high	50
yellow high	45
yellow low	-46
red low	-50
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.537 sofie detector_temp_6

Description

Detector 6 Temperature (dt6)

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	30.8576354980469
c1	-0.00627892790362239
c2	2.13014956784718e-07
c3	-3.79525534263681e-12
c4	3.65373352800757e-17
c5	-1.91917501523053e-22
c6	5.17010452818661e-28
c7	-5.58394209033898e-34

Limits

alarm	limit
red high	50
yellow high	45
yellow low	-46
red low	-50
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.538 sofie detector_temp_7

Description

Detector 7 Temperature (dt7)

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	30.8576354980469
c1	-0.00627892790362239
c2	2.13014956784718e-07
c3	-3.79525534263681e-12
c4	3.65373352800757e-17
c5	-1.91917501523053e-22
c6	5.17010452818661e-28
c7	-5.58394209033898e-34

Limits

alarm	limit
red high	50
yellow high	45
yellow low	-46
red low	-50
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.539 sofie detector_temp_8

Description

Detector 8 Temperature (dt8)

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	30.8576354980469
c1	-0.00627892790362239
c2	2.13014956784718e-07
c3	-3.79525534263681e-12
c4	3.65373352800757e-17
c5	-1.91917501523053e-22
c6	5.17010452818661e-28
c7	-5.58394209033898e-34

Limits

alarm	limit
red high	50
yellow high	45
yellow low	-46
red low	-50
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.540 sofie detector_temp_9

Description

Detector 9 Temperature (dt9)

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_7D
start	-32768
stop	32767
c0	30.8576354980469
c1	-0.00627892790362239
c2	2.13014956784718e-07
c3	-3.79525534263681e-12
c4	3.65373352800757e-17
c5	-1.91917501523053e-22
c6	5.17010452818661e-28
c7	-5.58394209033898e-34

Limits

alarm	limit
red high	50
yellow high	45
yellow low	-46
red low	-50
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.541 sofie eng_data_err

Description
Engineering Data Handler errors (0x4F)

Data Type
32 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Limits

alarm	limit
red high	1
yellow high	1
yellow low	-1
red low	-1
delta	*none*

Telemetry Source Packets
sofie system_data (556)

E.542 sofie free_run_time

Description
Timestamp, Packet

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.543 sofie freeformspace

Description
Free form data space

Data Type
3488 bits, fill, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie system_data (556)

E.544 sofie hk_checksum

Description
Checksum

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie hk (541)

E.545 sofie length

Description
length of data dump

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie test_dump (560)

E.546 sofie lost_messages

Description
Number of lost free format messages

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets

sofie system_data (556)

E.547 sofie m1553_cmnd_err

Description

1553 Command Handler errors (0x42)

Data Type

32 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	1
yellow high	1
yellow low	-1
red low	-1
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.548 sofie m1553_data_err

Description

1553 Data Handler errors (0x47)

Data Type

32 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	2
yellow high	1
yellow low	-1
red low	-2
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.549 sofie p384flg

Description
SOFIE housekeeping packet header, segment flags

Data Type
2 bits, unsigned integer, engineering units = dn.

Measurement Source
SOFIE

Telemetry Source Packets
sofie hk (541)

E.550 sofie p384hws

Description
SOFIE housekeeping secondary header, seconds (high order)

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
SOFIE

Telemetry Source Packets
sofie hk (541)

E.551 sofie p384hwss

Description
SOFIE housekeeping secondary header, subseconds (high order)

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
SOFIE

Telemetry Source Packets
sofie hk (541)

E.552 sofie p384lws

Description
SOFIE housekeeping secondary header, seconds (low order)

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
SOFIE

Telemetry Source Packets
sofie hk (541)

E.553 sofie p384lwss

Description
SOFIE housekeeping secondary header, subseconds (low order)

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
SOFIE

Telemetry Source Packets
sofie hk (541)

E.554 sofie p384pid

Description
SOFIE housekeeping packet header, type and apid

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
SOFIE

Telemetry Source Packets
sofie hk (541)

E.555 sofie p384pl

Description
SOFIE housekeeping packet header, packet length

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
SOFIE

Telemetry Source Packets
sofie hk (541)

E.556 sofie p384sct

Description
SOFIE housekeeping packet header, sequence counter

Data Type
14 bits, unsigned integer, engineering units = dn.

Measurement Source
SOFIE

Telemetry Source Packets
sofie hk (541)

E.557 sofie p385flg

Description
SOFIE science packet header, segment flags

Data Type
2 bits, unsigned integer, engineering units = dn.

Measurement Source
SOFIE

Telemetry Source Packets
sofie sci (545)

E.558 sofie p385hws

Description
SOFIE science secondary header, seconds (high order)

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
SOFIE

Telemetry Source Packets
sofie sci (545)

E.559 sofie p385hwss

Description
SOFIE science secondary header, subseconds (high order)

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
SOFIE

Telemetry Source Packets
sofie sci (545)

E.560 sofie p385lws

Description
SOFIE science secondary header, seconds (low order)

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
SOFIE

Telemetry Source Packets
sofie sci (545)

E.561 sofie p385lwss

Description
SOFIE science secondary header, subseconds (low order)

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
SOFIE

Telemetry Source Packets
sofie sci (545)

E.562 sofie p385pid

Description
SOFIE science packet header, type and apid

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
SOFIE

Telemetry Source Packets
sofie sci (545)

E.563 sofie p385pl

Description
SOFIE science packet header, packet length

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
SOFIE

Telemetry Source Packets
sofie sci (545)

E.564 sofie p385sct

Description
SOFIE science packet header, sequence counter

Data Type
14 bits, unsigned integer, engineering units = dn.

Measurement Source
SOFIE

Telemetry Source Packets
sofie sci (545)

E.565 sofie p386flg

Description
SOFIE reserved 1 packet header, segment flags

Data Type
2 bits, unsigned integer, engineering units = dn.

Measurement Source
SOFIE

Telemetry Source Packets
sofie system_data (556)

E.566 sofie p386hws

Description
SOFIE reserved 1 secondary header, seconds (high order)

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
SOFIE

Telemetry Source Packets
sofie system_data (556)

E.567 sofie p386hwss

Description
SOFIE reserved 1 secondary header, subseconds (high order)

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
SOFIE

Telemetry Source Packets
sofie system_data (556)

E.568 sofie p386lws

Description
SOFIE reserved 1 secondary header, seconds (low order)

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
SOFIE

Telemetry Source Packets
sofie system_data (556)

E.569 sofie p386lwss

Description
SOFIE reserved 1 secondary header, subseconds (low order)

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
SOFIE

Telemetry Source Packets
sofie system_data (556)

E.570 sofie p386pid

Description
SOFIE reserved 1 packet header, type and apid

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
SOFIE

Telemetry Source Packets
sofie system_data (556)

E.571 sofie p386pl

Description
SOFIE reserved 1 packet header, packet length

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
SOFIE

Telemetry Source Packets
sofie system_data (556)

E.572 sofie p386sct

Description
SOFIE reserved 1 packet header, sequence counter

Data Type
14 bits, unsigned integer, engineering units = dn.

Measurement Source
SOFIE

Telemetry Source Packets
sofie system_data (556)

E.573 sofie p387flg

Description
SOFIE reserved 2 packet header, segment flags

Data Type
2 bits, unsigned integer, engineering units = dn.

Measurement Source
SOFIE

Telemetry Source Packets
sofie event_data (540)

E.574 sofie p387hws

Description
SOFIE reserved 2 secondary header, seconds (high order)

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
SOFIE

Telemetry Source Packets
sofie event_data (540)

E.575 sofie p387hwss

Description
SOFIE reserved 2 secondary header, subseconds (high order)

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
SOFIE

Telemetry Source Packets
sofie event_data (540)

E.576 sofie p387lws

Description
SOFIE reserved 2 secondary header, seconds (low order)

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
SOFIE

Telemetry Source Packets
sofie event_data (540)

E.577 sofie p387lwss

Description
SOFIE reserved 2 secondary header, subseconds (low order)

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
SOFIE

Telemetry Source Packets
sofie event_data (540)

E.578 sofie p387pid

Description
SOFIE reserved 2 packet header, type and apid

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
SOFIE

Telemetry Source Packets
sofie event_data (540)

E.579 sofie p387pl

Description
SOFIE reserved 2 packet header, packet length

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
SOFIE

Telemetry Source Packets
sofie event_data (540)

E.580 sofie p387sct

Description
SOFIE reserved 2 packet header, sequence counter

Data Type
14 bits, unsigned integer, engineering units = dn.

Measurement Source
SOFIE

Telemetry Source Packets
sofie event_data (540)

E.581 sofie p388flg

Description
SOFIE reserved 3 packet header, segment flags

Data Type
2 bits, unsigned integer, engineering units = dn.

Measurement Source
SOFIE

Telemetry Source Packets
sofie mem_dump (544)

E.582 sofie p388hws

Description
SOFIE reserved 3 secondary header, seconds (high order)

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
SOFIE

Telemetry Source Packets
sofie mem_dump (544)

E.583 sofie p388hwss

Description
SOFIE reserved 3 secondary header, subseconds (high order)

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
SOFIE

Telemetry Source Packets
sofie mem_dump (544)

E.584 sofie p388lws

Description
SOFIE reserved 3 secondary header, seconds (low order)

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
SOFIE

Telemetry Source Packets
sofie mem_dump (544)

E.585 sofie p388lwss

Description
SOFIE reserved 3 secondary header, subseconds (low order)

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
SOFIE

Telemetry Source Packets
sofie mem_dump (544)

E.586 sofie p388pid

Description
SOFIE reserved 3 packet header, type and apid

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
SOFIE

Telemetry Source Packets
sofie mem_dump (544)

E.587 sofie p388pl

Description
SOFIE reserved 3 packet header, packet length

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
SOFIE

Telemetry Source Packets
sofie mem_dump (544)

E.588 sofie p388sct

Description
SOFIE reserved 3 packet header, sequence counter

Data Type
14 bits, unsigned integer, engineering units = dn.

Measurement Source
SOFIE

Telemetry Source Packets
sofie mem_dump (544)

E.589 sofie p389flg

Description
SOFIE reserved 4 packet header, segment flags

Data Type
2 bits, unsigned integer, engineering units = dn.

Measurement Source
SOFIE

Telemetry Source Packets
sofie test_dump (560)

E.590 sofie p389hws

Description
SOFIE reserved 4 secondary header, seconds (high order)

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
SOFIE

Telemetry Source Packets
sofie test_dump (560)

E.591 sofie p389hwss

Description
SOFIE reserved 4 secondary header, subseconds (high order)

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
SOFIE

Telemetry Source Packets
sofie test_dump (560)

E.592 sofie p389lws

Description
SOFIE reserved 4 secondary header, seconds (low order)

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
SOFIE

Telemetry Source Packets
sofie test_dump (560)

E.593 sofie p389lwss

Description
SOFIE reserved 4 secondary header, subseconds (low order)

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
SOFIE

Telemetry Source Packets
sofie test_dump (560)

E.594 sofie p389pid

Description
SOFIE reserved 4 packet header, type and apid

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
SOFIE

Telemetry Source Packets
sofie test_dump (560)

E.595 sofie p389pl

Description
SOFIE reserved 4 packet header, packet length

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
SOFIE

Telemetry Source Packets
sofie test_dump (560)

E.596 sofie p389sct

Description
SOFIE reserved 4 packet header, sequence counter

Data Type
14 bits, unsigned integer, engineering units = dn.

Measurement Source
SOFIE

Telemetry Source Packets
sofie test_dump (560)

E.597 sofie pkt_filler

Description
sofie packet filler.

Data Type
7568 bits, character string, engineering units = any.

Measurement Source
software

Discussion
NOTE: This is a NON-FLIGHT ISIM-ONLY telemetry item.

Telemetry Source Packets
sofie event_data (540), **sofie mem_dump** (544)

E.598 sofie point_stabil_err

Description
Pointing and Stabilization errors (0x87)

Data Type
32 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Limits

alarm	limit
red high	1
yellow high	1
yellow low	-1
red low	-1
delta	*none*

Telemetry Source Packets
sofie system_data (556)

E.599 sofie prt_volt_ref_1

Description
PRT voltage reference channel 1 (ts16)

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	0
c1	0.00011444091796875
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	2.70000004768372
yellow high	2.59999990463257
yellow low	2.40000009536743
red low	2.29999995231628
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.600 sofie prt_volt_ref_2

Description

PRT voltage reference channel 2 (ts32)

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	0
c1	0.00011444091796875
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	2.70000004768372
yellow high	2.59999990463257
yellow low	2.40000009536743
red low	2.29999995231628
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.601 sofie prt_volt_ref_3

Description

PRT voltage reference channel 3 (ts48)

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	0
c1	0.00011444091796875
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	2.70000004768372
yellow high	2.59999990463257
yellow low	2.40000009536743
red low	2.29999995231628
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.602 sofie prt_volt_ref_4

Description

PRT voltage reference channel 4 (ts64)

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	0
c1	0.00011444091796875
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	2.70000004768372
yellow high	2.59999990463257
yellow low	2.40000009536743
red low	2.29999995231628
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.603 sofie ref_res_1380_ch1

Description

”(INT) Reference resistor, 1.38 KOhms = 373 Kelvin (ts2)”

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-256.033325195312
c1	0.0117182433605194
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	100
yellow high	98
yellow low	95
red low	93
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.604 sofie ref_res_1380_ch2

Description

”(INT) Reference resistor, 1.38 KOhms = 373 Kelvin (ts18)”

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-256.033325195312
c1	0.0117182433605194
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	100
yellow high	98
yellow low	95
red low	93
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.605 sofie ref_res_1380_ch3

Description

”(INT) Reference resistor, 1.38 KOhms = 373 Kelvin (ts34)”

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-256.033325195312
c1	0.0117182433605194
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	100
yellow high	98
yellow low	95
red low	93
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.606 sofie ref_res_1380_ch4

Description

”(INT) Reference resistor, 1.38 KOhms = 373 Kelvin (ts50)”

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-256.033325195312
c1	0.0117182433605194
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	100
yellow high	98
yellow low	95
red low	93
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.607 sofie ref_res_200_ch1

Description

”(INT) Reference resistor, 200 Ohms = 77 Kelvin (ts1)”

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-256.033325195312
c1	0.0117182433605194
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	-201
yellow high	-203
yellow low	-207
red low	-209
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.608 sofie ref_res_200_ch2

Description

”(INT) Reference resistor, 200 Ohms = 77 Kelvin (ts17)”

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-256.033325195312
c1	0.0117182433605194
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	-201
yellow high	-203
yellow low	-207
red low	-209
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.609 sofie ref_res_200_ch3

Description

”(INT) Reference resistor, 200 Ohms = 77 Kelvin (ts33)”

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-256.033325195312
c1	0.0117182433605194
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	-201
yellow high	-203
yellow low	-207
red low	-209
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.610 sofie ref_res_200_ch4

Description

”(INT) Reference resistor, 200 Ohms = 77 Kelvin (ts49)”

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-256.033325195312
c1	0.0117182433605194
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	-201
yellow high	-203
yellow low	-207
red low	-209
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.611 sofie reserved10

Description

Reserved

Data Type

32 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Telemetry Source Packets

sofie system_data (556)

E.612 sofie reserved11

Description

Reserved

Data Type

32 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie system_data (556)

E.613 sofie reserved12

Description
Reserved

Data Type
32 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie system_data (556)

E.614 sofie reserved13

Description
Reserved

Data Type
32 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie system_data (556)

E.615 sofie reserved14

Description
Reserved

Data Type
32 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets

sofie system_data (556)

E.616 sofie reserved15

Description

Reserved

Data Type

32 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Telemetry Source Packets

sofie system_data (556)

E.617 sofie reserved16

Description

Reserved

Data Type

32 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Telemetry Source Packets

sofie system_data (556)

E.618 sofie reserved17

Description

Reserved

Data Type

32 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Telemetry Source Packets

sofie system_data (556)

E.619 sofie reserved7

Description
Reserved

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie system_data (556)

E.620 sofie reserved8

Description
Reserved

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie system_data (556)

E.621 sofie reserved9

Description
Reserved

Data Type
32 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie system_data (556)

E.622 sofie sci_data_err

Description
Science Data Handler errors (0x50)

Data Type
32 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Limits

alarm	limit
red high	1
yellow high	1
yellow low	-1
red low	-1
delta	*none*

Telemetry Source Packets
sofie system_data (556)

E.623 sofie science_spare

Description
unused

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.624 sofie ss_EH_FR_err

Description
Sun Sensor Error Handling& Fault Response errors (0x85)

Data Type
32 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	1
yellow high	1
yellow low	-1
red low	-1
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.625 sofie ss_I_T_err

Description

Sun Sensor Init& Task Manager errors (0x81)

Data Type

32 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	1
yellow high	1
yellow low	-1
red low	-1
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.626 sofie ss_ST_Diag_err

Description

Sun Sensor Self-Test and Diagnostics errors (0x84)

Data Type

32 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	1
yellow high	1
yellow low	-1
red low	-1
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.627 sofie ss_cmndexec_err

Description

Sun Sensor Command Executor errors (0x86)

Data Type

32 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	1
yellow high	1
yellow low	-1
red low	-1
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.628 sofie ss_critical_err

Description

Sun Sensor Critical errors (0x80)

Data Type

32 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	1
yellow high	1
yellow low	-1
red low	-1
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.629 sofie ss_data_acq_err

Description

Sun Sensor Data Acquisition Handler errors (0x83)

Data Type

32 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	1
yellow high	1
yellow low	-1
red low	-1
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.630 sofie ss_queue_err

Description

Sun Sensor Queue Function errors (0x8A)

Data Type

32 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	1
yellow high	1
yellow low	-1
red low	-1
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.631 sofie ssb_comm_err

Description

Sun Sensor Board Comm Handler errors (0x51)

Data Type

32 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	1
yellow high	1
yellow low	-1
red low	-1
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.632 sofie ssb_state_table0

Description

SSB State& Event table word 0 (processing rate, etc.)

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Telemetry Source Packets

sofie system_data (556)

E.633 sofie ssb_state_table1

Description
SSB State& Event table word 1 (subslice #)

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie system_data (556)

E.634 sofie ssb_state_table2

Description
SSB State& Event table word 2 (20 Hz Interrupt counter)

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie system_data (556)

E.635 sofie ssb_state_table3

Description
SSB State& Event table word 3 (modes)

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie system_data (556)

E.636 sofie ssb_state_table4

Description
SSB State& Event table word 4 (SS algorithm state)

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie system_data (556)

E.637 sofie ssb_taskm_stat_1

Description
Interrupt count, SSB task manager status

Data Type
6 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie system_data (556)

E.638 sofie ssb_taskm_stat_2

Description
Mode, SSB task manager status

Data Type
4 bits, discrete state, engineering units = dn.

Measurement Source
sofie

State Conversions

state	value	desirability
SAFE	1	GOOD
STANDBY	2	GOOD
SCIENCE	4	GOOD
QUIET	8	GOOD

Telemetry Source Packets

sofie system_data (556)

E.639 sofie ssb_taskm_stat_3

Description

Sequence, SSB task manager status

Data Type

4 bits, discrete state, engineering units = dn.

Measurement Source

sofie

State Conversions

state	value	desirability
INIT	0	GOOD
POLLING	1	GOOD
LOAD	2	GOOD
TEST1	4	GOOD
TEST2	8	GOOD

Telemetry Source Packets

sofie system_data (556)

E.640 sofie ssb_taskm_stat_4

Description

20 Hz& 1 Hz interrupt, SSB task manager status

Data Type

2 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Telemetry Source Packets

sofie system_data (556)

E.641 sofie ssb_taskm_stat_5

Description

Error, SSB task manager status

Data Type
4 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie system_data (556)

E.642 sofie ssb_taskm_stat_6

Description
Timer, SSB task manager status

Data Type
4 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie system_data (556)

E.643 sofie ssb_taskm_stat_7

Description
Quiet_100Hz, SSB task manager status

Data Type
4 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie system_data (556)

E.644 sofie ssb_taskm_stat_8

Description
SSB, SSB task manager status

Data Type
2 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie system_data (556)

E.645 sofie ssb_taskm_stat_9

Description
Int_5_0, SSB task manager status

Data Type
2 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie system_data (556)

E.646 sofie start_address

Description
start address of data dump

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie test_dump (560)

E.647 sofie steermirror_err

Description
Steering Mirror Handler errors (0x88)

Data Type
32 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Limits

alarm	limit
red high	1
yellow high	1
yellow low	-1
red low	-1
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.648 sofie suntrack_err

Description

Sun Tracking Algorithm errors (0x89)

Data Type

32 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	2
yellow high	1
yellow low	-1
red low	-2
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.649 sofie sync_ctrl_reg

Description

Sync Control Register

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Telemetry Source Packets

sofie system_data (556)

E.650 sofie sync_fall_ps_1

Description

Sync Rectifier #1 Falling Edge Phase Shift

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	65535
yellow high	428
yellow low	408
red low	-65535
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.651 sofie sync_fall_ps_10

Description

Sync Rectifier #10 Falling Edge Phase Shift

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	65535
yellow high	424
yellow low	404
red low	-65535
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.652 sofie sync_fall_ps_11

Description

Sync Rectifier #11 Falling Edge Phase Shift

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	65535
yellow high	422
yellow low	402
red low	-65535
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.653 sofie sync_fall_ps_12

Description

Sync Rectifier #12 Falling Edge Phase Shift

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	65535
yellow high	422
yellow low	402
red low	-65535
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.654 sofie sync_fall_ps_13

Description

Sync Rectifier #13 Falling Edge Phase Shift

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	65535
yellow high	422
yellow low	402
red low	-65535
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.655 sofie sync_fall_ps_14

Description

Sync Rectifier #14 Falling Edge Phase Shift

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	65535
yellow high	422
yellow low	402
red low	-65535
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.656 sofie sync_fall_ps_15

Description

Sync Rectifier #15 Falling Edge Phase Shift

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	65535
yellow high	422
yellow low	402
red low	-65535
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.657 sofie sync_fall_ps_16

Description

Sync Rectifier #16 Falling Edge Phase Shift

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	65535
yellow high	422
yellow low	402
red low	-65535
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.658 sofie sync_fall_ps_2

Description

Sync Rectifier #2 Falling Edge Phase Shift

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	65535
yellow high	428
yellow low	408
red low	-65535
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.659 sofie sync_fall_ps_3

Description

Sync Rectifier #3 Falling Edge Phase Shift

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	65535
yellow high	420
yellow low	400
red low	-65535
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.660 sofie sync_fall_ps_4

Description

Sync Rectifier #4 Falling Edge Phase Shift

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	65535
yellow high	421
yellow low	401
red low	-65535
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.661 sofie sync_fall_ps_5

Description

Sync Rectifier #5 Falling Edge Phase Shift

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	65535
yellow high	425
yellow low	405
red low	-65535
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.662 sofie sync_fall_ps_6

Description

Sync Rectifier #6 Falling Edge Phase Shift

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	65535
yellow high	425
yellow low	405
red low	-65535
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.663 sofie sync_fall_ps_7

Description

Sync Rectifier #7 Falling Edge Phase Shift

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	65535
yellow high	436
yellow low	416
red low	-65535
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.664 sofie sync_fall_ps_8

Description

Sync Rectifier #8 Falling Edge Phase Shift

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	65535
yellow high	433
yellow low	413
red low	-65535
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.665 sofie sync_fall_ps_9

Description

Sync Rectifier #9 Falling Edge Phase Shift

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	65535
yellow high	423
yellow low	403
red low	-65535
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.666 sofie sync_pulse_wdth1

Description
Sync Rectifier Pulse Width (microseconds)

Data Type
12 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie system_data (556)

E.667 sofie sync_pulse_wdth2

Description
Sync Rectifier Pulse Width (additional 83.33 nsec clock pulses)

Data Type
4 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie system_data (556)

E.668 sofie sync_rise_ps_1

Description
Sync Rectifier #1 Rising Edge Phase Shift

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Limits

alarm	limit
red high	65535
yellow high	344
yellow low	324
red low	-65535
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.669 sofie sync_rise_ps_10

Description

Sync Rectifier #10 Rising Edge Phase Shift

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	65535
yellow high	335
yellow low	315
red low	-65535
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.670 sofie sync_rise_ps_11

Description

Sync Rectifier #11 Rising Edge Phase Shift

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	65535
yellow high	337
yellow low	317
red low	-65535
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.671 sofie sync_rise_ps_12

Description

Sync Rectifier #12 Rising Edge Phase Shift

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	65535
yellow high	335
yellow low	315
red low	-65535
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.672 sofie sync_rise_ps_13

Description

Sync Rectifier #13 Rising Edge Phase Shift

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	65535
yellow high	337
yellow low	317
red low	-65535
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.673 sofie sync_rise_ps_14

Description

Sync Rectifier #14 Rising Edge Phase Shift

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	65535
yellow high	337
yellow low	317
red low	-65535
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.674 sofie sync_rise_ps_15

Description

Sync Rectifier #15 Rising Edge Phase Shift

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	65535
yellow high	336
yellow low	316
red low	-65535
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.675 sofie sync_rise_ps_16

Description

Sync Rectifier #16 Rising Edge Phase Shift

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	65535
yellow high	336
yellow low	316
red low	-65535
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.676 sofie sync_rise_ps_2

Description

Sync Rectifier #2 Rising Edge Phase Shift

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	65535
yellow high	344
yellow low	324
red low	-65535
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.677 sofie sync_rise_ps_3

Description

Sync Rectifier #3 Rising Edge Phase Shift

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	65535
yellow high	334
yellow low	314
red low	-65535
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.678 sofie sync_rise_ps_4

Description

Sync Rectifier #4 Rising Edge Phase Shift

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	65535
yellow high	332
yellow low	312
red low	-65535
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.679 sofie sync_rise_ps_5

Description

Sync Rectifier #5 Rising Edge Phase Shift

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	65535
yellow high	333
yellow low	313
red low	-65535
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.680 sofie sync_rise_ps_6

Description

Sync Rectifier #6 Rising Edge Phase Shift

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	65535
yellow high	335
yellow low	315
red low	-65535
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.681 sofie sync_rise_ps_7

Description

Sync Rectifier #7 Rising Edge Phase Shift

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	65535
yellow high	333
yellow low	313
red low	-65535
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.682 sofie sync_rise_ps_8

Description

Sync Rectifier #8 Rising Edge Phase Shift

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	65535
yellow high	338
yellow low	318
red low	-65535
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.683 sofie sync_rise_ps_9

Description

Sync Rectifier #9 Rising Edge Phase Shift

Data Type

16 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	65535
yellow high	335
yellow low	315
red low	-65535
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.684 sofie sys_critical_err

Description

System Critical errors (0x00)

Data Type

32 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	1
yellow high	1
yellow low	-1
red low	-1
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.685 sofie tec_ctrl_err

Description

Thermo-Electric Coolers Control errors (0x49)

Data Type

32 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	1
yellow high	1
yellow low	-1
red low	-1
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.686 sofie tec_volt_ref_1

Description

TEC voltage reference channel 1 (ts14)

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	0
c1	0.00011444091796875
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	2.70000004768372
yellow high	2.59999990463257
yellow low	2.40000009536743
red low	2.29999995231628
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.687 sofie tec_volt_ref_2

Description

TEC voltage reference channel 2 (ts15)

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	0
c1	0.00011444091796875
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	2.70000004768372
yellow high	2.59999990463257
yellow low	2.40000009536743
red low	2.29999995231628
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.688 sofie tec_volt_ref_3

Description

TEC voltage reference channel 3 (ts30)

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	0
c1	0.00011444091796875
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	2.70000004768372
yellow high	2.59999990463257
yellow low	2.40000009536743
red low	2.29999995231628
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.689 sofie tec_volt_ref_4

Description

TEC voltage reference channel 4 (ts31)

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	0
c1	0.00011444091796875
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	2.70000004768372
yellow high	2.59999990463257
yellow low	2.40000009536743
red low	2.29999995231628
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.690 sofie tec_volt_ref_5

Description

TEC voltage reference channel 5 (ts46)

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	0
c1	0.00011444091796875
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	2.70000004768372
yellow high	2.59999990463257
yellow low	2.40000009536743
red low	2.29999995231628
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.691 sofie tec_volt_ref_6

Description

TEC voltage reference channel 6 (ts47)

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	0
c1	0.00011444091796875
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	2.70000004768372
yellow high	2.59999990463257
yellow low	2.40000009536743
red low	2.29999995231628
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.692 sofie tec_volt_ref_7

Description

TEC voltage reference channel 7 (ts62)

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	0
c1	0.00011444091796875
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	2.70000004768372
yellow high	2.59999990463257
yellow low	2.40000009536743
red low	2.29999995231628
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.693 sofie tec_volt_ref_8

Description

TEC voltage reference channel 8 (ts63)

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	0
c1	0.00011444091796875
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	2.70000004768372
yellow high	2.59999990463257
yellow low	2.40000009536743
red low	2.29999995231628
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.694 sofie temp_aft_optic1

Description

”(EXT) temperature sensor, Aft optics bench #1 (ts22)”

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-256.033325195312
c1	0.0117182433605194
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	50
yellow high	45
yellow low	-60
red low	-65
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.695 sofie temp_aft_optic2

Description

”(EXT) temperature sensor, Aft optics bench #2 (ts41)”

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-256.033325195312
c1	0.0117182433605194
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	50
yellow high	45
yellow low	-60
red low	-65
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.696 sofie temp_aft_optic3

Description

”(EXT) temperature sensor, Aft optics bench #3 (ts57)”

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-256.033325195312
c1	0.0117182433605194
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	50
yellow high	45
yellow low	-60
red low	-65
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.697 sofie temp_apt_housing

Description

”(EXT) temperature sensor, Sterring mirror housing top (ts54)”

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-256.033325195312
c1	0.0117182433605194
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	50
yellow high	45
yellow low	-60
red low	-65
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.698 sofie temp_base_deck

Description

”(EXT) temperature sensor, Base deck plate (ts42)”

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-256.033325195312
c1	0.0117182433605194
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	50
yellow high	45
yellow low	-60
red low	-65
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.699 sofie temp_blueline

Description

”(EXT) temperature sensor, Blueline electronics box (ts35)”

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-256.033325195312
c1	0.0117182433605194
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	50
yellow high	45
yellow low	-39
red low	-42
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.700 sofie temp_cable_blkhd

Description

”(EXT) temperature sensor, Upper cable bulkhead (ts20)”

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-256.033325195312
c1	0.0117182433605194
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	50
yellow high	45
yellow low	-60
red low	-65
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.701 sofie temp_cdh_pcb

Description

”(INT) temperature sensor, &DH PCB (ts12)”

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-256.033325195312
c1	0.0117182433605194
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	75
yellow high	70
yellow low	-45
red low	-50
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.702 sofie temp_chop_pcb

Description

"(INT) temperature sensor, Chopper PCB (ts44)"

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-256.033325195312
c1	0.0117182433605194
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	75
yellow high	70
yellow low	-45
red low	-50
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.703 sofie temp_cover_hinge

Description

”(EXT) temperature sensor, Aperature cover base frame (ts51)”

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-256.033325195312
c1	0.0117182433605194
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	50
yellow high	45
yellow low	-60
red low	-65
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.704 sofie temp_csm_bmsplit

Description

”(EXT) temperature sensor, CSM beamsplitter assembly (ts10)”

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-256.033325195312
c1	0.0117182433605194
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	50
yellow high	45
yellow low	-60
red low	-65
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.705 sofie temp_datacq_pcb1

Description

”(INT) temperature sensor, Data acquisition PCB #1 (ts13)”

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-256.033325195312
c1	0.0117182433605194
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	75
yellow high	70
yellow low	-45
red low	-50
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.706 sofie temp_datacq_pcb2

Description

”(INT) temperature sensor, Data acquisition PCB #2 (ts45)”

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-256.033325195312
c1	0.0117182433605194
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	75
yellow high	70
yellow low	-45
red low	-50
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.707 sofie temp_ebox_base1

Description

”(INT) temperature sensor, Electronics box baseplate #1 (ts11)”

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-256.033325195312
c1	0.0117182433605194
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	70
yellow high	65
yellow low	-45
red low	-50
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.708 sofie temp_ebox_base2

Description

”(INT) temperature sensor, Electronics box baseplate #2 (ts43)”

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-256.033325195312
c1	0.0117182433605194
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	70
yellow high	65
yellow low	-45
red low	-50
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.709 sofie temp_far_optics

Description

”(EXT) temperature sensor, CSM far optics module (ts25)”

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-256.033325195312
c1	0.0117182433605194
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	50
yellow high	45
yellow low	-60
red low	-65
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.710 sofie temp_fore_optic1

Description

”(EXT) temperature sensor, Fore optics bench #1 (ts6)”

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-256.033325195312
c1	0.0117182433605194
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	50
yellow high	45
yellow low	-60
red low	-65
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.711 sofie temp_fore_optic2

Description

”(EXT) temperature sensor, Fore optics bench #2 (ts52)”

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-256.033325195312
c1	0.0117182433605194
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	50
yellow high	45
yellow low	-60
red low	-65
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.712 sofie temp_mid_optics

Description

”(EXT) temperature sensor, Mid optics housing (ts36)”

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-256.033325195312
c1	0.0117182433605194
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	50
yellow high	45
yellow low	-60
red low	-65
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.713 sofie temp_near_optics

Description

”(EXT) temperature sensor, CSM near optics module (ts9)”

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-256.033325195312
c1	0.0117182433605194
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	50
yellow high	45
yellow low	-60
red low	-65
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.714 sofie temp_ohb_10_12

Description

”(EXT) temperature sensor, Optics housing bands 10 and 12 (ts39)”

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-256.033325195312
c1	0.0117182433605194
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	50
yellow high	45
yellow low	-60
red low	-65
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.715 sofie temp_ohb_13_15

Description

”(EXT) temperature sensor, Optics housing bands 13 and 15 (ts40)”

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-256.033325195312
c1	0.0117182433605194
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	50
yellow high	45
yellow low	-60
red low	-65
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.716 sofie temp_ohb_14_16

Description

”(EXT) temperature sensor, Optics housing bands 14 and 16 (ts24)”

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-256.033325195312
c1	0.0117182433605194
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	50
yellow high	45
yellow low	-60
red low	-65
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.717 sofie temp_ohb_1_3

Description

”(EXT) temperature,sensor, Optics housing bands 1 and 3 (ts7)”

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-256.033325195312
c1	0.0117182433605194
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	50
yellow high	45
yellow low	-60
red low	-65
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.718 sofie temp_ohb_2_4

Description

”(EXT) temperature sensor, Optics housing bands 2 and 4 (ts56)”

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-256.033325195312
c1	0.0117182433605194
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	50
yellow high	45
yellow low	-60
red low	-65
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.719 sofie temp_ohb_5_7

Description

”(EXT) temperature sensor, Optics housing bands 5 and 7 (ts55)”

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-256.033325195312
c1	0.0117182433605194
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	50
yellow high	45
yellow low	-60
red low	-65
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.720 sofie temp_ohb_6_8

Description

”(EXT) temperature sensor, Optics housing bands 6 and 8 (ts8)”

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-256.033325195312
c1	0.0117182433605194
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	50
yellow high	45
yellow low	-60
red low	-65
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.721 sofie temp_ohb_9_11

Description

”(EXT) temperature sensor, Optics housing bands 9 and 11 (ts23)”

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-256.033325195312
c1	0.0117182433605194
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	50
yellow high	45
yellow low	-60
red low	-65
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.722 sofie temp_pin_puller

Description

"(EXT) temperature sensor, Pin puller (ts4)"

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-256.033325195312
c1	0.0117182433605194
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	50
yellow high	45
yellow low	-60
red low	-65
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.723 sofie temp_rad_center

Description

"(EXT) temperature sensor, Radiator center (ts37)"

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-256.033325195312
c1	0.0117182433605194
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	60
yellow high	55
yellow low	-90
red low	-95
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.724 sofie temp_rad_top

Description

”(EXT) temperature sensor, Radiator top (ts5)”

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-256.033325195312
c1	0.0117182433605194
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	60
yellow high	55
yellow low	-90
red low	-95
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.725 sofie temp_sigcon_tec1

Description

”(INT) temperature sensor, Signal Conditioning / TEC PCB #1 (ts27)”

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-256.033325195312
c1	0.0117182433605194
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	75
yellow high	70
yellow low	-45
red low	-50
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.726 sofie temp_sigcon_tec2

Description

”(INT) temperature sensor, Signal Conditioning / TEC PCB #2 (ts28)”

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-256.033325195312
c1	0.0117182433605194
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	75
yellow high	70
yellow low	-45
red low	-50
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.727 sofie temp_sigcon_tec3

Description

"(INT) temperature sensor, Signal Conditioning / TEC PCB #3 (ts59)"

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-256.033325195312
c1	0.0117182433605194
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	75
yellow high	70
yellow low	-45
red low	-50
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.728 sofie temp_sigcon_tec4

Description

”(INT) temperature sensor, Signal Conditioning / TEC PCB #4 (ts60)”

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-256.033325195312
c1	0.0117182433605194
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	75
yellow high	70
yellow low	-45
red low	-50
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.729 sofie temp_spare_38

Description

”(EXT) temperature sensor, Spare (ts38)”

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-256.033325195312
c1	0.0117182433605194
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Telemetry Source Packets

sofie hk (541)

E.730 sofie temp_ss_module

Description

”(EXT) temperature sensor, Sun sensor module (ts53)”

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-256.033325195312
c1	0.0117182433605194
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	50
yellow high	45
yellow low	-39
red low	-42
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.731 sofie temp_ss_pcb

Description

”(EXT) temperature sensor, Sun sensor PCB (ts21)”

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-256.033325195312
c1	0.0117182433605194
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	50
yellow high	45
yellow low	-39
red low	-42
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.732 sofie temp_ssg_pcb

Description

”(INT) temperature sensor, SSG Mirror amplifier PCB (ts26)”

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-256.033325195312
c1	0.0117182433605194
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	75
yellow high	70
yellow low	-45
red low	-50
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.733 sofie temp_ssg_servo

Description

”(INT) temperature sensor, SSG Servo I/O PCB (ts58)”

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-256.033325195312
c1	0.0117182433605194
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	75
yellow high	70
yellow low	-45
red low	-50
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.734 sofie temp_steer_base

Description

”(EXT) temperature sensor, Steering mirror base (ts19)”

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-256.033325195312
c1	0.0117182433605194
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	50
yellow high	45
yellow low	-60
red low	-65
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.735 sofie temp_steer_mirr

Description

”(EXT) temperature sensor, Steering mirror motor coil (ts3)”

Data Type

16 bits, signed integer, engineering units = C.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	-256.033325195312
c1	0.0117182433605194
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	50
yellow high	45
yellow low	-60
red low	-65
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.736 sofie timed_cmnd_err

Description

Timed Command Processor errors (0x4C)

Data Type

32 bits, unsigned integer, engineering units = dn.

Measurement Source

sofie

Limits

alarm	limit
red high	1
yellow high	1
yellow low	-1
red low	-1
delta	*none*

Telemetry Source Packets

sofie system_data (556)

E.737 sofie timestamp_wd2

Description
Timestamp, (Absolute Time, Word 2)

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie hk (541)

E.738 sofie timestamp_wd3

Description
”Timestamp, (Absolute Time, Word 3)”

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie hk (541)

E.739 sofie type_identifier

Description
type of data dump

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie test_dump (560)

E.740 sofie unused

Description
unused

Data Type
16 bits, unsigned integer, engineering units = dn.

Measurement Source
sofie

Telemetry Source Packets
sofie sci (545)

E.741 sofie volts_m12v_inst

Description
PS Voltage Monitor -12V_I (ps2)

Data Type
16 bits, signed integer, engineering units = V.

Measurement Source
sofie

Analog Conversions
Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	0
c1	0.000459594739368185
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	-11.3000001907349
yellow high	-11.6000003814697
yellow low	-12.3999996185303
red low	-12.6999998092651
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.742 sofie volts_m12v_sm

Description

PS Voltage Monitor -12V_SM (ps10)

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	0
c1	0.000459594739368185
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	-11.1000003814697
yellow high	-11.3999996185303
yellow low	-12.6000003814697
red low	-12.8999996185303
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.743 sofie volts_p12v_inst

Description

PS Voltage Monitor +12V_I (ps1)

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	0
c1	0.000459594739368185
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	12.6999998092651
yellow high	12.3999996185303
yellow low	11.6000003814697
red low	11.3000001907349
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.744 sofie volts_p12v_sm

Description

PS Voltage Monitor +12V_SM (ps9)

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	0
c1	0.000459594739368185
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	12.8999996185303
yellow high	12.6000003814697
yellow low	11.3999996185303
red low	11.1000003814697
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.745 sofie volts_p2_5v_fpga

Description

PS Voltage Monitor +2.5V FPGA (ps14)

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	0
c1	0.00018310546875
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	2.70000004768372
yellow high	2.59999990463257
yellow low	2.40000009536743
red low	2.29999995231628
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.746 sofie volts_p3_3v_tec

Description

PS Voltage Monitor +3.3V TEC (ps6)

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	0
c1	0.00018310546875
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	3.59999990463257
yellow high	3.5
yellow low	3.09999990463257
red low	3
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.747 sofie volts_p3_3v_tec2

Description

PS Voltage Monitor +3.3V TEC V2 (ps13)

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	0
c1	0.00018310546875
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	3.59999990463257
yellow high	3.5
yellow low	3.09999990463257
red low	3
delta	*none*

Telemetry Source Packets

sofie hk (541)

E.748 sofie volts_p5v

Description

PS Voltage Monitor +5V (ps5)

Data Type

16 bits, signed integer, engineering units = V.

Measurement Source

sofie

Analog Conversions

Segment 1

type	UNSEGMENTED_5D
start	-32768
stop	32767
c0	0
c1	0.00018310546875
c2	0
c3	0
c4	0
c5	0
c6	0
c7	0

Limits

alarm	limit
red high	5.40000009536743
yellow high	5.19999980926514
yellow low	4.80000019073486
red low	4.59999990463257
delta	*none*

Telemetry Source Packets

sofie hk (541)

F

Telemetry Packet List

OASIS-CC/FSW database version TBD, Tue Jul 11 10:08:52 2006.

F.1 sofie event_data

Packet Source Application Identifier
0x183 (387)

OASIS Stream Name
sofie387

Description
sofie reserved packet.

Discussion
SOFIE event data packet. Default Packet Production Status: Packets produced asynchronously on command.

Format

Packet **sofie event_data** Format

start bit	stop bit	size bits	field	control	method
0	15	16	**sofie p387pid** (441)	–	–
16	17	2	**sofie p387flg** (440)	–	–
18	31	14	**sofie p387sct** (442)	–	–
32	47	16	**sofie p387pl** (442)	–	–
48	63	16	**sofie p387hws** (440)	–	–
64	79	16	**sofie p387lws** (441)	–	–
80	95	16	**sofie p387hwss** (440)	–	–
96	111	16	**sofie p387lwss** (441)	–	–
112	7679	7568	**sofie pkt_filler** (448)	–	–

Packet size = 7680 bits (960 bytes) .

F.2 sofie hk

Packet Source Application Identifier

0x180 (384)

OASIS Stream Name

sofie384

Description

sofie housekeeping.

Discussion

SOFIE software status: state, counters, etc and hardware houskeeping values: temperatures, voltages, etc..

Default Packet Production Status:

Packets produced every TBS seconds.

Format

Packet **sofie hk** Format

start bit	stop bit	size bits	field	control	method
0	15	16	**sofie p384pid** (433)	–	–
16	17	2	**sofie p384flg** (432)	–	–
18	31	14	**sofie p384sct** (434)	–	–
32	47	16	**sofie p384pl** (434)	–	–
48	63	16	**sofie p384hws** (432)	–	–
64	79	16	**sofie p384lws** (433)	–	–
80	95	16	**sofie p384hwss** (432)	–	–
96	111	16	**sofie p384lwss** (433)	–	–
112	127	16	**sofie timestamp_wd2** (531)	–	–
128	143	16	**sofie timestamp_wd3** (531)	–	–
144	159	16	**sofie detector_temp_1** (416)	–	–
160	175	16	**sofie detector_temp_5** (425)	–	–
176	191	16	**sofie detector_temp_9** (428)	–	–
192	207	16	**sofie detector_temp_13** (419)	–	–
208	223	16	**sofie ref_res_200_ch1** (455)	–	–
224	239	16	**sofie ref_res_200_ch2** (456)	–	–
240	255	16	**sofie ref_res_200_ch3** (456)	–	–
256	271	16	**sofie ref_res_200_ch4** (457)	–	–
272	287	16	**sofie detector_temp_2** (422)	–	–
288	303	16	**sofie detector_temp_6** (425)	–	–
304	319	16	**sofie detector_temp_10** (417)	–	–
320	335	16	**sofie detector_temp_14** (420)	–	–
336	351	16	**sofie ref_res_1380_ch1** (452)	–	–
352	367	16	**sofie ref_res_1380_ch2** (452)	–	–
368	383	16	**sofie ref_res_1380_ch3** (453)	–	–
384	399	16	**sofie ref_res_1380_ch4** (454)	–	–
400	415	16	**sofie detector_temp_3** (423)	–	–
416	431	16	**sofie detector_temp_7** (426)	–	–

Packet **sofie hk** Format, cont'd

start bit	stop bit	size bits	field		
432	447	16	**sofie detector_temp_11** (417)	–	–
448	463	16	**sofie detector_temp_15** (421)	–	–
464	479	16	**sofie temp_steer_mirr** (529)	–	–
480	495	16	**sofie temp_steer_base** (528)	–	–
496	511	16	**sofie temp_blueline** (501)	–	–
512	527	16	**sofie temp_cover_hinge** (504)	–	–
528	543	16	**sofie detector_temp_4** (424)	–	–
544	559	16	**sofie detector_temp_8** (427)	–	–
560	575	16	**sofie detector_temp_12** (418)	–	–
576	591	16	**sofie detector_temp_16** (421)	–	–
592	607	16	**sofie temp_pin_puller** (519)	–	–
608	623	16	**sofie temp_cable_blkhd** (501)	–	–
624	639	16	**sofie temp_mid_optics** (511)	–	–
640	655	16	**sofie temp_fore_optic2** (510)	–	–
656	671	16	**sofie volts_p12v_inst** (533)	–	–
672	687	16	**sofie volts_p5v** (537)	–	–
688	703	16	**sofie volts_p12v_sm** (534)	–	–
704	719	16	**sofie volts_p3_3v_tec2** (537)	–	–
720	735	16	**sofie temp_rad_top** (521)	–	–
736	751	16	**sofie temp_ss_pcb** (526)	–	–
752	767	16	**sofie temp_rad_center** (520)	–	–
768	783	16	**sofie temp_ss_module** (525)	–	–
784	799	16	**sofie volts_m12v_inst** (532)	–	–
800	815	16	**sofie volts_p3_3v_tec** (536)	–	–
816	831	16	**sofie volts_m12v_sm** (533)	–	–
832	847	16	**sofie volts_p2_5v_fpga** (535)	–	–
848	863	16	**sofie temp_fore_optic1** (509)	–	–
864	879	16	**sofie temp_aft_optic1** (497)	–	–
880	895	16	**sofie temp_spare_38** (525)	–	–
896	911	16	**sofie temp_apt_housing** (499)	–	–
912	927	16	**sofie curr_p12v_inst** (410)	–	–
928	943	16	**sofie curr_p5v** (414)	–	–
944	959	16	**sofie curr_p12v_sm** (411)	–	–
960	975	16	**sofie curr_p3_3v_tec2** (414)	–	–
976	991	16	**sofie temp_ohb_1_3** (515)	–	–
992	1007	16	**sofie temp_ohb_9_11** (518)	–	–
1008	1023	16	**sofie temp_ohb_10_12** (513)	–	–
1024	1039	16	**sofie temp_ohb_5_7** (517)	–	–
1040	1055	16	**sofie curr_m12v_inst** (409)	–	–
1056	1071	16	**sofie curr_p3_3v_tec** (413)	–	–
1072	1087	16	**sofie curr_m12v_sm** (410)	–	–
1088	1103	16	**sofie curr_p2_5v_fpga** (412)	–	–
1104	1119	16	**sofie temp_ohb_6_8** (517)	–	–
1120	1135	16	**sofie temp_ohb_14_16** (514)	–	–
1136	1151	16	**sofie temp_ohb_13_15** (513)	–	–
1152	1167	16	**sofie temp_ohb_2_4** (516)	–	–
1168	1183	16	**sofie temp_near_optics** (512)	–	–

Packet **sofie hk** Format, cont'd

start bit	stop bit	size bits	field		
1184	1199	16	**sofie temp_far_optics** (509)	–	–
1200	1215	16	**sofie temp_aft_optic2** (497)	–	–
1216	1231	16	**sofie temp_aft_optic3** (498)	–	–
1232	1247	16	**sofie temp_csm_bmsplit** (505)	–	–
1248	1263	16	**sofie temp_ssg_pcb** (527)	–	–
1264	1279	16	**sofie temp_base_deck** (500)	–	–
1280	1295	16	**sofie temp_ssg_servo** (528)	–	–
1296	1311	16	**sofie temp_ebox_base1** (507)	–	–
1312	1327	16	**sofie temp_sigcon_tec1** (521)	–	–
1328	1343	16	**sofie temp_ebox_base2** (508)	–	–
1344	1359	16	**sofie temp_sigcon_tec3** (523)	–	–
1360	1375	16	**sofie temp_cdh_pcb** (502)	–	–
1376	1391	16	**sofie temp_sigcon_tec2** (522)	–	–
1392	1407	16	**sofie temp_chop_pcb** (503)	–	–
1408	1423	16	**sofie temp_sigcon_tec4** (524)	–	–
1424	1439	16	**sofie temp_datacq_pcb1** (505)	–	–
1440	1455	16	**sofie chop_health_rt** (406)	–	–
1456	1471	16	**sofie temp_datacq_pcb2** (506)	–	–
1472	1487	16	**sofie chop_health_left** (405)	–	–
1488	1503	16	**sofie tec_volt_ref_1** (490)	–	–
1504	1519	16	**sofie tec_volt_ref_3** (492)	–	–
1520	1535	16	**sofie tec_volt_ref_5** (493)	–	–
1536	1551	16	**sofie tec_volt_ref_7** (495)	–	–
1552	1567	16	**sofie tec_volt_ref_2** (491)	–	–
1568	1583	16	**sofie tec_volt_ref_4** (493)	–	–
1584	1599	16	**sofie tec_volt_ref_6** (494)	–	–
1600	1615	16	**sofie tec_volt_ref_8** (496)	–	–
1616	1631	16	**sofie prt_volt_ref_1** (448)	–	–
1632	1647	16	**sofie prt_volt_ref_2** (449)	–	–
1648	1663	16	**sofie prt_volt_ref_3** (450)	–	–
1664	1679	16	**sofie prt_volt_ref_4** (451)	–	–
1680	1695	16	**sofie hk_checksum** (430)	–	–

Packet size = 1696 bits (212 bytes) .

F.3 sofie mem_dump

Packet Source Application Identifier

0x184 (388)

OASIS Stream Name

sofie388

Description

sofie memory dump packet.

Discussion

SOFIE memory dump packet.

Default Packet Production Status:

Packets produced asynchronously on command.

Format

Packet **sofie mem_dump** Format

start bit	stop bit	size bits	field	control	method
0	15	16	**sofie p388pid** (444)	–	–
16	17	2	**sofie p388flg** (442)	–	–
18	31	14	**sofie p388sct** (445)	–	–
32	47	16	**sofie p388pl** (444)	–	–
48	63	16	**sofie p388hws** (443)	–	–
64	79	16	**sofie p388lws** (443)	–	–
80	95	16	**sofie p388hwss** (443)	–	–
96	111	16	**sofie p388lwss** (444)	–	–
112	7679	7568	**sofie pkt_filler** (448)	–	–

Packet size = 7680 bits (960 bytes) .

F.4 sofie sci

Packet Source Application Identifier

0x181 (385)

OASIS Stream Name

sofie385

Description

sofie science packet.

Discussion

Contains SOFIE science detector data and corresponding instrument configuration.

Default Packet Production Status:

Enabled and produced synchronously after enough SOFIE cycles have completed such that the packet is full.

Format

Packet **sofie sci** Format

start bit	stop bit	size bits	field	control	method
0	15	16	**sofie p385pid** (436)	–	–
16	17	2	**sofie p385flg** (434)	–	–
18	31	14	**sofie p385sct** (437)	–	–
32	47	16	**sofie p385pl** (436)	–	–
48	63	16	**sofie p385hws** (435)	–	–
64	79	16	**sofie p385lws** (435)	–	–
80	95	16	**sofie p385hwss** (435)	–	–
96	111	16	**sofie p385lwss** (436)	–	–
112	127	16	**sofie free_run_time** (429)	–	–
128	143	16	**sofie science_spare** (462)	–	–
144	159	16	**sofie A_TIME_Det** (186)	–	–
160	175	16	**sofie A_Det_V01** (157)	–	–
176	191	16	**sofie A_Det_V02** (158)	–	–
192	207	16	**sofie A_Det_V03** (158)	–	–
208	223	16	**sofie A_Det_V04** (159)	–	–
224	239	16	**sofie A_Det_V05** (160)	–	–
240	255	16	**sofie A_Det_V06** (160)	–	–
256	271	16	**sofie A_Det_V07** (161)	–	–
272	287	16	**sofie A_Det_V08** (162)	–	–
288	303	16	**sofie A_Det_V09** (162)	–	–
304	319	16	**sofie A_Det_V10** (163)	–	–
320	335	16	**sofie A_Det_V11** (164)	–	–
336	351	16	**sofie A_Det_V12** (164)	–	–
352	367	16	**sofie A_Det_V13** (165)	–	–
368	383	16	**sofie A_Det_V14** (166)	–	–
384	399	16	**sofie A_Det_V15** (166)	–	–
400	415	16	**sofie A_Det_V16** (167)	–	–
416	431	16	**sofie A_Det_V17** (168)	–	–

Packet **sofie sci** Format, cont'd

start bit	stop bit	size bits	field		
432	447	16	**sofie A_Det_V18** (168)	–	–
448	463	16	**sofie A_Det_V19** (169)	–	–
464	479	16	**sofie A_Det_V20** (170)	–	–
480	495	16	**sofie A_Det_V21** (170)	–	–
496	511	16	**sofie A_Det_V22** (171)	–	–
512	527	16	**sofie A_Det_V23** (172)	–	–
528	543	16	**sofie A_Det_V24** (172)	–	–
544	559	16	**sofie B_TIME_Det** (219)	–	–
560	575	16	**sofie B_Det_V01** (190)	–	–
576	591	16	**sofie B_Det_V02** (191)	–	–
592	607	16	**sofie B_Det_V03** (191)	–	–
608	623	16	**sofie B_Det_V04** (192)	–	–
624	639	16	**sofie B_Det_V05** (193)	–	–
640	655	16	**sofie B_Det_V06** (193)	–	–
656	671	16	**sofie B_Det_V07** (194)	–	–
672	687	16	**sofie B_Det_V08** (195)	–	–
688	703	16	**sofie B_Det_V09** (195)	–	–
704	719	16	**sofie B_Det_V10** (196)	–	–
720	735	16	**sofie B_Det_V11** (197)	–	–
736	751	16	**sofie B_Det_V12** (197)	–	–
752	767	16	**sofie B_Det_V13** (198)	–	–
768	783	16	**sofie B_Det_V14** (199)	–	–
784	799	16	**sofie B_Det_V15** (199)	–	–
800	815	16	**sofie B_Det_V16** (200)	–	–
816	831	16	**sofie B_Det_V17** (201)	–	–
832	847	16	**sofie B_Det_V18** (201)	–	–
848	863	16	**sofie B_Det_V19** (202)	–	–
864	879	16	**sofie B_Det_V20** (203)	–	–
880	895	16	**sofie B_Det_V21** (203)	–	–
896	911	16	**sofie B_Det_V22** (204)	–	–
912	927	16	**sofie B_Det_V23** (205)	–	–
928	943	16	**sofie B_Det_V24** (205)	–	–
944	959	16	**sofie C_TIME_Det** (252)	–	–
960	975	16	**sofie C_Det_V01** (223)	–	–
976	991	16	**sofie C_Det_V02** (224)	–	–
992	1007	16	**sofie C_Det_V03** (224)	–	–
1008	1023	16	**sofie C_Det_V04** (225)	–	–
1024	1039	16	**sofie C_Det_V05** (226)	–	–
1040	1055	16	**sofie C_Det_V06** (226)	–	–
1056	1071	16	**sofie C_Det_V07** (227)	–	–
1072	1087	16	**sofie C_Det_V08** (228)	–	–
1088	1103	16	**sofie C_Det_V09** (228)	–	–
1104	1119	16	**sofie C_Det_V10** (229)	–	–
1120	1135	16	**sofie C_Det_V11** (230)	–	–
1136	1151	16	**sofie C_Det_V12** (230)	–	–
1152	1167	16	**sofie C_Det_V13** (231)	–	–
1168	1183	16	**sofie C_Det_V14** (232)	–	–

Packet **sofie sci** Format, cont'd

start bit	stop bit	size bits	field		
1184	1199	16	**sofie C_Det_V15** (232)	–	–
1200	1215	16	**sofie C_Det_V16** (233)	–	–
1216	1231	16	**sofie C_Det_V17** (234)	–	–
1232	1247	16	**sofie C_Det_V18** (234)	–	–
1248	1263	16	**sofie C_Det_V19** (235)	–	–
1264	1279	16	**sofie C_Det_V20** (236)	–	–
1280	1295	16	**sofie C_Det_V21** (236)	–	–
1296	1311	16	**sofie C_Det_V22** (237)	–	–
1312	1327	16	**sofie C_Det_V23** (238)	–	–
1328	1343	16	**sofie C_Det_V24** (238)	–	–
1344	1359	16	**sofie D_TIME_Det** (285)	–	–
1360	1375	16	**sofie D_Det_V01** (256)	–	–
1376	1391	16	**sofie D_Det_V02** (257)	–	–
1392	1407	16	**sofie D_Det_V03** (258)	–	–
1408	1423	16	**sofie D_Det_V04** (258)	–	–
1424	1439	16	**sofie D_Det_V05** (259)	–	–
1440	1455	16	**sofie D_Det_V06** (260)	–	–
1456	1471	16	**sofie D_Det_V07** (260)	–	–
1472	1487	16	**sofie D_Det_V08** (261)	–	–
1488	1503	16	**sofie D_Det_V09** (262)	–	–
1504	1519	16	**sofie D_Det_V10** (262)	–	–
1520	1535	16	**sofie D_Det_V11** (263)	–	–
1536	1551	16	**sofie D_Det_V12** (264)	–	–
1552	1567	16	**sofie D_Det_V13** (264)	–	–
1568	1583	16	**sofie D_Det_V14** (265)	–	–
1584	1599	16	**sofie D_Det_V15** (266)	–	–
1600	1615	16	**sofie D_Det_V16** (266)	–	–
1616	1631	16	**sofie D_Det_V17** (267)	–	–
1632	1647	16	**sofie D_Det_V18** (268)	–	–
1648	1663	16	**sofie D_Det_V19** (268)	–	–
1664	1679	16	**sofie D_Det_V20** (269)	–	–
1680	1695	16	**sofie D_Det_V21** (270)	–	–
1696	1711	16	**sofie D_Det_V22** (270)	–	–
1712	1727	16	**sofie D_Det_V23** (271)	–	–
1728	1743	16	**sofie D_Det_V24** (272)	–	–
1744	1759	16	**sofie E_TIME_Det** (318)	–	–
1760	1775	16	**sofie E_Det_V01** (289)	–	–
1776	1791	16	**sofie E_Det_V02** (290)	–	–
1792	1807	16	**sofie E_Det_V03** (291)	–	–
1808	1823	16	**sofie E_Det_V04** (291)	–	–
1824	1839	16	**sofie E_Det_V05** (292)	–	–
1840	1855	16	**sofie E_Det_V06** (293)	–	–
1856	1871	16	**sofie E_Det_V07** (293)	–	–
1872	1887	16	**sofie E_Det_V08** (294)	–	–
1888	1903	16	**sofie E_Det_V09** (295)	–	–
1904	1919	16	**sofie E_Det_V10** (295)	–	–
1920	1935	16	**sofie E_Det_V11** (296)	–	–

Packet **sofie sci** Format, cont'd

start bit	stop bit	size bits	field		
1936	1951	16	**sofie E_Det_V12** (297)	–	–
1952	1967	16	**sofie E_Det_V13** (297)	–	–
1968	1983	16	**sofie E_Det_V14** (298)	–	–
1984	1999	16	**sofie E_Det_V15** (299)	–	–
2000	2015	16	**sofie E_Det_V16** (299)	–	–
2016	2031	16	**sofie E_Det_V17** (300)	–	–
2032	2047	16	**sofie E_Det_V18** (301)	–	–
2048	2063	16	**sofie E_Det_V19** (301)	–	–
2064	2079	16	**sofie E_Det_V20** (302)	–	–
2080	2095	16	**sofie E_Det_V21** (303)	–	–
2096	2111	16	**sofie E_Det_V22** (303)	–	–
2112	2127	16	**sofie E_Det_V23** (304)	–	–
2128	2143	16	**sofie E_Det_V24** (305)	–	–
2144	2159	16	**sofie F_TIME_Det** (351)	–	–
2160	2175	16	**sofie F_Det_V01** (322)	–	–
2176	2191	16	**sofie F_Det_V02** (323)	–	–
2192	2207	16	**sofie F_Det_V03** (324)	–	–
2208	2223	16	**sofie F_Det_V04** (324)	–	–
2224	2239	16	**sofie F_Det_V05** (325)	–	–
2240	2255	16	**sofie F_Det_V06** (326)	–	–
2256	2271	16	**sofie F_Det_V07** (326)	–	–
2272	2287	16	**sofie F_Det_V08** (327)	–	–
2288	2303	16	**sofie F_Det_V09** (328)	–	–
2304	2319	16	**sofie F_Det_V10** (328)	–	–
2320	2335	16	**sofie F_Det_V11** (329)	–	–
2336	2351	16	**sofie F_Det_V12** (330)	–	–
2352	2367	16	**sofie F_Det_V13** (330)	–	–
2368	2383	16	**sofie F_Det_V14** (331)	–	–
2384	2399	16	**sofie F_Det_V15** (332)	–	–
2400	2415	16	**sofie F_Det_V16** (332)	–	–
2416	2431	16	**sofie F_Det_V17** (333)	–	–
2432	2447	16	**sofie F_Det_V18** (334)	–	–
2448	2463	16	**sofie F_Det_V19** (334)	–	–
2464	2479	16	**sofie F_Det_V20** (335)	–	–
2480	2495	16	**sofie F_Det_V21** (336)	–	–
2496	2511	16	**sofie F_Det_V22** (336)	–	–
2512	2527	16	**sofie F_Det_V23** (337)	–	–
2528	2543	16	**sofie F_Det_V24** (338)	–	–
2544	2559	16	**sofie G_TIME_Det** (384)	–	–
2560	2575	16	**sofie G_Det_V01** (355)	–	–
2576	2591	16	**sofie G_Det_V02** (356)	–	–
2592	2607	16	**sofie G_Det_V03** (357)	–	–
2608	2623	16	**sofie G_Det_V04** (357)	–	–
2624	2639	16	**sofie G_Det_V05** (358)	–	–
2640	2655	16	**sofie G_Det_V06** (359)	–	–
2656	2671	16	**sofie G_Det_V07** (359)	–	–
2672	2687	16	**sofie G_Det_V08** (360)	–	–

Packet **sofie sci** Format, cont'd

start bit	stop bit	size bits	field		
2688	2703	16	**sofie G_Det_V09** (361)	–	–
2704	2719	16	**sofie G_Det_V10** (361)	–	–
2720	2735	16	**sofie G_Det_V11** (362)	–	–
2736	2751	16	**sofie G_Det_V12** (363)	–	–
2752	2767	16	**sofie G_Det_V13** (363)	–	–
2768	2783	16	**sofie G_Det_V14** (364)	–	–
2784	2799	16	**sofie G_Det_V15** (365)	–	–
2800	2815	16	**sofie G_Det_V16** (365)	–	–
2816	2831	16	**sofie G_Det_V17** (366)	–	–
2832	2847	16	**sofie G_Det_V18** (367)	–	–
2848	2863	16	**sofie G_Det_V19** (367)	–	–
2864	2879	16	**sofie G_Det_V20** (368)	–	–
2880	2895	16	**sofie G_Det_V21** (369)	–	–
2896	2911	16	**sofie G_Det_V22** (369)	–	–
2912	2927	16	**sofie G_Det_V23** (370)	–	–
2928	2943	16	**sofie G_Det_V24** (371)	–	–
2944	2959	16	**sofie A_TIME_TkA** (187)	–	–
2960	2975	16	**sofie A_TkA_LwX** (189)	–	–
2976	2991	16	**sofie A_TkA_HiX** (187)	–	–
2992	3007	16	**sofie A_TkA_LwY** (189)	–	–
3008	3023	16	**sofie A_TkA_HiY** (188)	–	–
3024	3039	16	**sofie A_PnS_DME** (174)	–	–
3040	3055	16	**sofie A_PnS_DMA** (173)	–	–
3056	3071	16	**sofie A_TIME_PnS** (187)	–	–
3072	3087	16	**sofie A_SMA_AME** (175)	–	–
3088	3103	16	**sofie A_SMA_AMA** (174)	–	–
3104	3119	16	**sofie B_TIME_TkA** (220)	–	–
3120	3135	16	**sofie B_TkA_LwX** (222)	–	–
3136	3151	16	**sofie B_TkA_HiX** (220)	–	–
3152	3167	16	**sofie B_TkA_LwY** (222)	–	–
3168	3183	16	**sofie B_TkA_HiY** (221)	–	–
3184	3199	16	**sofie B_PnS_DME** (207)	–	–
3200	3215	16	**sofie B_PnS_DMA** (206)	–	–
3216	3231	16	**sofie B_TIME_PnS** (220)	–	–
3232	3247	16	**sofie B_SMA_AME** (208)	–	–
3248	3263	16	**sofie B_SMA_AMA** (207)	–	–
3264	3279	16	**sofie C_TIME_TkA** (253)	–	–
3280	3295	16	**sofie C_TkA_LwX** (255)	–	–
3296	3311	16	**sofie C_TkA_HiX** (254)	–	–
3312	3327	16	**sofie C_TkA_LwY** (256)	–	–
3328	3343	16	**sofie C_TkA_HiY** (254)	–	–
3344	3359	16	**sofie C_PnS_DME** (240)	–	–
3360	3375	16	**sofie C_PnS_DMA** (239)	–	–
3376	3391	16	**sofie C_TIME_PnS** (253)	–	–
3392	3407	16	**sofie C_SMA_AME** (241)	–	–
3408	3423	16	**sofie C_SMA_AMA** (240)	–	–
3424	3439	16	**sofie D_TIME_TkA** (286)	–	–

Packet **sofie sci** Format, cont'd

start bit	stop bit	size bits	field		
3440	3455	16	**sofie D_TkA_LwX** (288)	–	–
3456	3471	16	**sofie D_TkA_HiX** (287)	–	–
3472	3487	16	**sofie D_TkA_LwY** (289)	–	–
3488	3503	16	**sofie D_TkA_HiY** (287)	–	–
3504	3519	16	**sofie D_PnS_DME** (273)	–	–
3520	3535	16	**sofie D_PnS_DMA** (272)	–	–
3536	3551	16	**sofie D_TIME_PnS** (286)	–	–
3552	3567	16	**sofie D_SMA_AME** (274)	–	–
3568	3583	16	**sofie D_SMA_AMA** (274)	–	–
3584	3599	16	**sofie E_TIME_TkA** (319)	–	–
3600	3615	16	**sofie E_TkA_LwX** (321)	–	–
3616	3631	16	**sofie E_TkA_HiX** (320)	–	–
3632	3647	16	**sofie E_TkA_LwY** (322)	–	–
3648	3663	16	**sofie E_TkA_HiY** (320)	–	–
3664	3679	16	**sofie E_PnS_DME** (306)	–	–
3680	3695	16	**sofie E_PnS_DMA** (305)	–	–
3696	3711	16	**sofie E_TIME_PnS** (319)	–	–
3712	3727	16	**sofie E_SMA_AME** (307)	–	–
3728	3743	16	**sofie E_SMA_AMA** (307)	–	–
3744	3759	16	**sofie F_TIME_TkA** (352)	–	–
3760	3775	16	**sofie F_TkA_LwX** (354)	–	–
3776	3791	16	**sofie F_TkA_HiX** (353)	–	–
3792	3807	16	**sofie F_TkA_LwY** (355)	–	–
3808	3823	16	**sofie F_TkA_HiY** (353)	–	–
3824	3839	16	**sofie F_PnS_DME** (339)	–	–
3840	3855	16	**sofie F_PnS_DMA** (338)	–	–
3856	3871	16	**sofie F_TIME_PnS** (352)	–	–
3872	3887	16	**sofie F_SMA_AME** (340)	–	–
3888	3903	16	**sofie F_SMA_AMA** (340)	–	–
3904	3919	16	**sofie G_TIME_TkA** (385)	–	–
3920	3935	16	**sofie G_TkA_LwX** (387)	–	–
3936	3951	16	**sofie G_TkA_HiX** (386)	–	–
3952	3967	16	**sofie G_TkA_LwY** (388)	–	–
3968	3983	16	**sofie G_TkA_HiY** (386)	–	–
3984	3999	16	**sofie G_PnS_DME** (372)	–	–
4000	4015	16	**sofie G_PnS_DMA** (371)	–	–
4016	4031	16	**sofie G_TIME_PnS** (385)	–	–
4032	4047	16	**sofie G_SMA_AME** (373)	–	–
4048	4063	16	**sofie G_SMA_AMA** (373)	–	–
4064	4079	16	**sofie A_TIME_Pix** (186)	–	–
4080	4095	16	**sofie A_Sum_LX01** (182)	–	–
4096	4111	16	**sofie A_Sum_LX02** (182)	–	–
4112	4127	16	**sofie A_Sum_LX03** (183)	–	–
4128	4143	16	**sofie A_Sum_LX04** (183)	–	–
4144	4159	16	**sofie A_Sum_LX05** (183)	–	–
4160	4175	16	**sofie A_Sum_LX06** (184)	–	–
4176	4191	16	**sofie A_Sum_LX07** (184)	–	–

Packet **sofie sci** Format, cont'd

start bit	stop bit	size bits	field		
4192	4207	16	**sofie A_Sum_HX01** (178)	–	–
4208	4223	16	**sofie A_Sum_HX02** (178)	–	–
4224	4239	16	**sofie A_Sum_HX03** (179)	–	–
4240	4255	16	**sofie A_Sum_HX04** (179)	–	–
4256	4271	16	**sofie A_Sum_HX05** (179)	–	–
4272	4287	16	**sofie A_Sum_HX06** (180)	–	–
4288	4303	16	**sofie A_Sum_HX07** (180)	–	–
4304	4319	16	**sofie A_Sum_LY01** (184)	–	–
4320	4335	16	**sofie A_Sum_LY02** (185)	–	–
4336	4351	16	**sofie A_Sum_LY03** (185)	–	–
4352	4367	16	**sofie A_Sum_LY04** (185)	–	–
4368	4383	16	**sofie A_Sum_LY05** (186)	–	–
4384	4399	16	**sofie A_Sum_HY01** (180)	–	–
4400	4415	16	**sofie A_Sum_HY02** (181)	–	–
4416	4431	16	**sofie A_Sum_HY03** (181)	–	–
4432	4447	16	**sofie A_Sum_HY04** (181)	–	–
4448	4463	16	**sofie A_Sum_HY05** (182)	–	–
4464	4479	16	**sofie A_Sum_C01** (176)	–	–
4480	4495	16	**sofie A_Sum_C02** (176)	–	–
4496	4511	16	**sofie A_Sum_C03** (176)	–	–
4512	4527	16	**sofie A_Sum_C04** (177)	–	–
4528	4543	16	**sofie A_Sum_C05** (177)	–	–
4544	4559	16	**sofie A_Sum_C06** (177)	–	–
4560	4575	16	**sofie A_Sum_C07** (178)	–	–
4576	4591	16	**sofie B_TIME_Pix** (219)	–	–
4592	4607	16	**sofie B_Sum_LX01** (215)	–	–
4608	4623	16	**sofie B_Sum_LX02** (215)	–	–
4624	4639	16	**sofie B_Sum_LX03** (216)	–	–
4640	4655	16	**sofie B_Sum_LX04** (216)	–	–
4656	4671	16	**sofie B_Sum_LX05** (216)	–	–
4672	4687	16	**sofie B_Sum_LX06** (217)	–	–
4688	4703	16	**sofie B_Sum_LX07** (217)	–	–
4704	4719	16	**sofie B_Sum_HX01** (211)	–	–
4720	4735	16	**sofie B_Sum_HX02** (211)	–	–
4736	4751	16	**sofie B_Sum_HX03** (212)	–	–
4752	4767	16	**sofie B_Sum_HX04** (212)	–	–
4768	4783	16	**sofie B_Sum_HX05** (212)	–	–
4784	4799	16	**sofie B_Sum_HX06** (213)	–	–
4800	4815	16	**sofie B_Sum_HX07** (213)	–	–
4816	4831	16	**sofie B_Sum_LY01** (217)	–	–
4832	4847	16	**sofie B_Sum_LY02** (218)	–	–
4848	4863	16	**sofie B_Sum_LY03** (218)	–	–
4864	4879	16	**sofie B_Sum_LY04** (218)	–	–
4880	4895	16	**sofie B_Sum_LY05** (219)	–	–
4896	4911	16	**sofie B_Sum_HY01** (213)	–	–
4912	4927	16	**sofie B_Sum_HY02** (214)	–	–
4928	4943	16	**sofie B_Sum_HY03** (214)	–	–

Packet **sofie sci** Format, cont'd

start bit	stop bit	size bits	field		
4944	4959	16	**sofie B_Sum_HY04** (214)	–	–
4960	4975	16	**sofie B_Sum_HY05** (215)	–	–
4976	4991	16	**sofie B_Sum_C01** (209)	–	–
4992	5007	16	**sofie B_Sum_C02** (209)	–	–
5008	5023	16	**sofie B_Sum_C03** (209)	–	–
5024	5039	16	**sofie B_Sum_C04** (210)	–	–
5040	5055	16	**sofie B_Sum_C05** (210)	–	–
5056	5071	16	**sofie B_Sum_C06** (210)	–	–
5072	5087	16	**sofie B_Sum_C07** (211)	–	–
5088	5103	16	**sofie C_TIME_Pix** (252)	–	–
5104	5119	16	**sofie C_Sum_LX01** (248)	–	–
5120	5135	16	**sofie C_Sum_LX02** (248)	–	–
5136	5151	16	**sofie C_Sum_LX03** (249)	–	–
5152	5167	16	**sofie C_Sum_LX04** (249)	–	–
5168	5183	16	**sofie C_Sum_LX05** (249)	–	–
5184	5199	16	**sofie C_Sum_LX06** (250)	–	–
5200	5215	16	**sofie C_Sum_LX07** (250)	–	–
5216	5231	16	**sofie C_Sum_HX01** (244)	–	–
5232	5247	16	**sofie C_Sum_HX02** (244)	–	–
5248	5263	16	**sofie C_Sum_HX03** (245)	–	–
5264	5279	16	**sofie C_Sum_HX04** (245)	–	–
5280	5295	16	**sofie C_Sum_HX05** (245)	–	–
5296	5311	16	**sofie C_Sum_HX06** (246)	–	–
5312	5327	16	**sofie C_Sum_HX07** (246)	–	–
5328	5343	16	**sofie C_Sum_LY01** (250)	–	–
5344	5359	16	**sofie C_Sum_LY02** (251)	–	–
5360	5375	16	**sofie C_Sum_LY03** (251)	–	–
5376	5391	16	**sofie C_Sum_LY04** (251)	–	–
5392	5407	16	**sofie C_Sum_LY05** (252)	–	–
5408	5423	16	**sofie C_Sum_HY01** (246)	–	–
5424	5439	16	**sofie C_Sum_HY02** (247)	–	–
5440	5455	16	**sofie C_Sum_HY03** (247)	–	–
5456	5471	16	**sofie C_Sum_HY04** (247)	–	–
5472	5487	16	**sofie C_Sum_HY05** (248)	–	–
5488	5503	16	**sofie C_Sum_C01** (242)	–	–
5504	5519	16	**sofie C_Sum_C02** (242)	–	–
5520	5535	16	**sofie C_Sum_C03** (242)	–	–
5536	5551	16	**sofie C_Sum_C04** (243)	–	–
5552	5567	16	**sofie C_Sum_C05** (243)	–	–
5568	5583	16	**sofie C_Sum_C06** (243)	–	–
5584	5599	16	**sofie C_Sum_C07** (244)	–	–
5600	5615	16	**sofie D_TIME_Pix** (286)	–	–
5616	5631	16	**sofie D_Sum_LX01** (281)	–	–
5632	5647	16	**sofie D_Sum_LX02** (282)	–	–
5648	5663	16	**sofie D_Sum_LX03** (282)	–	–
5664	5679	16	**sofie D_Sum_LX04** (282)	–	–
5680	5695	16	**sofie D_Sum_LX05** (283)	–	–

Packet **sofie sci** Format, cont'd

start bit	stop bit	size bits	field		
5696	5711	16	**sofie D_Sum_LX06** (283)	–	–
5712	5727	16	**sofie D_Sum_LX07** (283)	–	–
5728	5743	16	**sofie D_Sum_HX01** (277)	–	–
5744	5759	16	**sofie D_Sum_HX02** (278)	–	–
5760	5775	16	**sofie D_Sum_HX03** (278)	–	–
5776	5791	16	**sofie D_Sum_HX04** (278)	–	–
5792	5807	16	**sofie D_Sum_HX05** (279)	–	–
5808	5823	16	**sofie D_Sum_HX06** (279)	–	–
5824	5839	16	**sofie D_Sum_HX07** (279)	–	–
5840	5855	16	**sofie D_Sum_LY01** (284)	–	–
5856	5871	16	**sofie D_Sum_LY02** (284)	–	–
5872	5887	16	**sofie D_Sum_LY03** (284)	–	–
5888	5903	16	**sofie D_Sum_LY04** (285)	–	–
5904	5919	16	**sofie D_Sum_LY05** (285)	–	–
5920	5935	16	**sofie D_Sum_HY01** (280)	–	–
5936	5951	16	**sofie D_Sum_HY02** (280)	–	–
5952	5967	16	**sofie D_Sum_HY03** (280)	–	–
5968	5983	16	**sofie D_Sum_HY04** (281)	–	–
5984	5999	16	**sofie D_Sum_HY05** (281)	–	–
6000	6015	16	**sofie D_Sum_C01** (275)	–	–
6016	6031	16	**sofie D_Sum_C02** (275)	–	–
6032	6047	16	**sofie D_Sum_C03** (276)	–	–
6048	6063	16	**sofie D_Sum_C04** (276)	–	–
6064	6079	16	**sofie D_Sum_C05** (276)	–	–
6080	6095	16	**sofie D_Sum_C06** (277)	–	–
6096	6111	16	**sofie D_Sum_C07** (277)	–	–
6112	6127	16	**sofie E_TIME_Pix** (319)	–	–
6128	6143	16	**sofie E_Sum_LX01** (314)	–	–
6144	6159	16	**sofie E_Sum_LX02** (315)	–	–
6160	6175	16	**sofie E_Sum_LX03** (315)	–	–
6176	6191	16	**sofie E_Sum_LX04** (315)	–	–
6192	6207	16	**sofie E_Sum_LX05** (316)	–	–
6208	6223	16	**sofie E_Sum_LX06** (316)	–	–
6224	6239	16	**sofie E_Sum_LX07** (316)	–	–
6240	6255	16	**sofie E_Sum_HX01** (310)	–	–
6256	6271	16	**sofie E_Sum_HX02** (311)	–	–
6272	6287	16	**sofie E_Sum_HX03** (311)	–	–
6288	6303	16	**sofie E_Sum_HX04** (311)	–	–
6304	6319	16	**sofie E_Sum_HX05** (312)	–	–
6320	6335	16	**sofie E_Sum_HX06** (312)	–	–
6336	6351	16	**sofie E_Sum_HX07** (312)	–	–
6352	6367	16	**sofie E_Sum_LY01** (317)	–	–
6368	6383	16	**sofie E_Sum_LY02** (317)	–	–
6384	6399	16	**sofie E_Sum_LY03** (317)	–	–
6400	6415	16	**sofie E_Sum_LY04** (318)	–	–
6416	6431	16	**sofie E_Sum_LY05** (318)	–	–
6432	6447	16	**sofie E_Sum_HY01** (313)	–	–

Packet **sofie sci** Format, cont'd

start bit	stop bit	size bits	field		
6448	6463	16	**sofie E_Sum_HY02** (313)	–	–
6464	6479	16	**sofie E_Sum_HY03** (313)	–	–
6480	6495	16	**sofie E_Sum_HY04** (314)	–	–
6496	6511	16	**sofie E_Sum_HY05** (314)	–	–
6512	6527	16	**sofie E_Sum_C01** (308)	–	–
6528	6543	16	**sofie E_Sum_C02** (308)	–	–
6544	6559	16	**sofie E_Sum_C03** (309)	–	–
6560	6575	16	**sofie E_Sum_C04** (309)	–	–
6576	6591	16	**sofie E_Sum_C05** (309)	–	–
6592	6607	16	**sofie E_Sum_C06** (310)	–	–
6608	6623	16	**sofie E_Sum_C07** (310)	–	–
6624	6639	16	**sofie F_TIME_Pix** (352)	–	–
6640	6655	16	**sofie F_Sum_LX01** (347)	–	–
6656	6671	16	**sofie F_Sum_LX02** (348)	–	–
6672	6687	16	**sofie F_Sum_LX03** (348)	–	–
6688	6703	16	**sofie F_Sum_LX04** (348)	–	–
6704	6719	16	**sofie F_Sum_LX05** (349)	–	–
6720	6735	16	**sofie F_Sum_LX06** (349)	–	–
6736	6751	16	**sofie F_Sum_LX07** (349)	–	–
6752	6767	16	**sofie F_Sum_HX01** (343)	–	–
6768	6783	16	**sofie F_Sum_HX02** (344)	–	–
6784	6799	16	**sofie F_Sum_HX03** (344)	–	–
6800	6815	16	**sofie F_Sum_HX04** (344)	–	–
6816	6831	16	**sofie F_Sum_HX05** (345)	–	–
6832	6847	16	**sofie F_Sum_HX06** (345)	–	–
6848	6863	16	**sofie F_Sum_HX07** (345)	–	–
6864	6879	16	**sofie F_Sum_LY01** (350)	–	–
6880	6895	16	**sofie F_Sum_LY02** (350)	–	–
6896	6911	16	**sofie F_Sum_LY03** (350)	–	–
6912	6927	16	**sofie F_Sum_LY04** (351)	–	–
6928	6943	16	**sofie F_Sum_LY05** (351)	–	–
6944	6959	16	**sofie F_Sum_HY01** (346)	–	–
6960	6975	16	**sofie F_Sum_HY02** (346)	–	–
6976	6991	16	**sofie F_Sum_HY03** (346)	–	–
6992	7007	16	**sofie F_Sum_HY04** (347)	–	–
7008	7023	16	**sofie F_Sum_HY05** (347)	–	–
7024	7039	16	**sofie F_Sum_C01** (341)	–	–
7040	7055	16	**sofie F_Sum_C02** (341)	–	–
7056	7071	16	**sofie F_Sum_C03** (342)	–	–
7072	7087	16	**sofie F_Sum_C04** (342)	–	–
7088	7103	16	**sofie F_Sum_C05** (342)	–	–
7104	7119	16	**sofie F_Sum_C06** (343)	–	–
7120	7135	16	**sofie F_Sum_C07** (343)	–	–
7136	7151	16	**sofie G_TIME_Pix** (385)	–	–
7152	7167	16	**sofie G_Sum_LX01** (380)	–	–
7168	7183	16	**sofie G_Sum_LX02** (381)	–	–
7184	7199	16	**sofie G_Sum_LX03** (381)	–	–

Packet **sofie sci** Format, cont'd

start bit	stop bit	size bits	field		
7200	7215	16	**sofie G_Sum_LX04** (381)	–	–
7216	7231	16	**sofie G_Sum_LX05** (382)	–	–
7232	7247	16	**sofie G_Sum_LX06** (382)	–	–
7248	7263	16	**sofie G_Sum_LX07** (382)	–	–
7264	7279	16	**sofie G_Sum_HX01** (376)	–	–
7280	7295	16	**sofie G_Sum_HX02** (377)	–	–
7296	7311	16	**sofie G_Sum_HX03** (377)	–	–
7312	7327	16	**sofie G_Sum_HX04** (377)	–	–
7328	7343	16	**sofie G_Sum_HX05** (378)	–	–
7344	7359	16	**sofie G_Sum_HX06** (378)	–	–
7360	7375	16	**sofie G_Sum_HX07** (378)	–	–
7376	7391	16	**sofie G_Sum_LY01** (383)	–	–
7392	7407	16	**sofie G_Sum_LY02** (383)	–	–
7408	7423	16	**sofie G_Sum_LY03** (383)	–	–
7424	7439	16	**sofie G_Sum_LY04** (384)	–	–
7440	7455	16	**sofie G_Sum_LY05** (384)	–	–
7456	7471	16	**sofie G_Sum_HY01** (379)	–	–
7472	7487	16	**sofie G_Sum_HY02** (379)	–	–
7488	7503	16	**sofie G_Sum_HY03** (379)	–	–
7504	7519	16	**sofie G_Sum_HY04** (380)	–	–
7520	7535	16	**sofie G_Sum_HY05** (380)	–	–
7536	7551	16	**sofie G_Sum_C01** (374)	–	–
7552	7567	16	**sofie G_Sum_C02** (374)	–	–
7568	7583	16	**sofie G_Sum_C03** (375)	–	–
7584	7599	16	**sofie G_Sum_C04** (375)	–	–
7600	7615	16	**sofie G_Sum_C05** (375)	–	–
7616	7631	16	**sofie G_Sum_C06** (376)	–	–
7632	7647	16	**sofie G_Sum_C07** (376)	–	–
7648	7663	16	**sofie checksum** (404)	–	–
7664	7679	16	**sofie unused** (532)	–	–

Packet size = 7680 bits (960 bytes) .

F.5 sofie system_data

Packet Source Application Identifier
0x182 (386)

OASIS Stream Name
sofie386

Description
sofie system data packet

Discussion
SOFIE system data packet. Default Packet Production Status: Packets produced asychronously on command.

Format

Packet **sofie system_data** Format

start bit	stop bit	size bits	field	control	method
0	15	16	**sofie p386pid** (439)	–	–
16	17	2	**sofie p386flg** (437)	–	–
18	31	14	**sofie p386sct** (439)	–	–
32	47	16	**sofie p386pl** (439)	–	–
48	63	16	**sofie p386hws** (437)	–	–
64	79	16	**sofie p386lws** (438)	–	–
80	95	16	**sofie p386hwss** (438)	–	–
96	111	16	**sofie p386lwss** (438)	–	–
112	127	16	**sofie ssb_state_table0** (466)	–	–
128	143	16	**sofie ssb_state_table1** (467)	–	–
144	159	16	**sofie ssb_state_table2** (467)	–	–
160	175	16	**sofie ssb_state_table3** (467)	–	–
176	191	16	**sofie ssb_state_table4** (468)	–	–
192	207	16	**sofie cmnd_response** (407)	–	–
208	223	16	**sofie lost_messages** (430)	–	–
224	225	2	**sofie cdh_taskm_stat_9** (404)	–	–
226	227	2	**sofie cdh_taskm_stat_8** (404)	–	–
228	231	4	**sofie cdh_taskm_stat_7** (403)	–	–
232	235	4	**sofie cdh_taskm_stat_6** (403)	–	–
236	239	4	**sofie cdh_taskm_stat_5** (403)	–	–
240	241	2	**sofie cdh_taskm_stat_4** (402)	–	–
242	245	4	**sofie cdh_taskm_stat_3** (402)	–	–
246	249	4	**sofie cdh_taskm_stat_2** (401)	–	–
250	255	6	**sofie cdh_taskm_stat_1** (401)	–	–
256	257	2	**sofie ssb_taskm_stat_9** (471)	–	–
258	259	2	**sofie ssb_taskm_stat_8** (470)	–	–
260	263	4	**sofie ssb_taskm_stat_7** (470)	–	–
264	267	4	**sofie ssb_taskm_stat_6** (470)	–	–
268	271	4	**sofie ssb_taskm_stat_5** (469)	–	–
272	273	2	**sofie ssb_taskm_stat_4** (469)	–	–
274	277	4	**sofie ssb_taskm_stat_3** (469)	–	–

Packet **sofie system_data** Format, cont'd

start bit	stop bit	size bits	field		
278	281	4	**sofie ssb_taskm_stat_2** (468)	–	–
282	287	6	**sofie ssb_taskm_stat_1** (468)	–	–
288	303	16	**sofie cmnd_opcode** (407)	–	–
304	319	16	**sofie cmnds_accepted** (408)	–	–
320	335	16	**sofie cmnds_rejected** (408)	–	–
336	351	16	**sofie reserved7** (461)	–	–
352	367	16	**sofie reserved8** (461)	–	–
368	383	16	**sofie atten_setting_1** (389)	–	–
384	399	16	**sofie atten_setting_2** (393)	–	–
400	415	16	**sofie atten_setting_3** (393)	–	–
416	431	16	**sofie atten_setting_4** (394)	–	–
432	447	16	**sofie atten_setting_5** (394)	–	–
448	463	16	**sofie atten_setting_6** (395)	–	–
464	479	16	**sofie atten_setting_7** (395)	–	–
480	495	16	**sofie atten_setting_8** (396)	–	–
496	511	16	**sofie atten_setting_9** (396)	–	–
512	527	16	**sofie atten_setting_10** (389)	–	–
528	543	16	**sofie atten_setting_11** (390)	–	–
544	559	16	**sofie atten_setting_12** (390)	–	–
560	575	16	**sofie atten_setting_13** (391)	–	–
576	591	16	**sofie atten_setting_14** (391)	–	–
592	607	16	**sofie atten_setting_15** (392)	–	–
608	623	16	**sofie atten_setting_16** (392)	–	–
624	655	32	**sofie sys_critical_err** (489)	–	–
656	687	32	**sofie cdh_critical_err** (400)	–	–
688	719	32	**sofie cdh_I_T_err** (398)	–	–
720	751	32	**sofie m1553_cmnd_err** (431)	–	–
752	783	32	**sofie cmnd_preproc_err** (407)	–	–
784	815	32	**sofie cdh_ST_Diag_err** (398)	–	–
816	847	32	**sofie codeupdate_err** (408)	–	–
848	879	32	**sofie cdh_EH_FR_err** (397)	–	–
880	911	32	**sofie m1553_data_err** (431)	–	–
912	943	32	**sofie cdh_cmndexec_err** (399)	–	–
944	975	32	**sofie tec_ctrl_err** (490)	–	–
976	1007	32	**sofie det_ctrl_err** (415)	–	–
1008	1039	32	**sofie chop_ctrl_err** (405)	–	–
1040	1071	32	**sofie timed_cmnd_err** (530)	–	–
1072	1103	32	**sofie automat_proc_err** (397)	–	–
1104	1135	32	**sofie cdh_data_acq_err** (400)	–	–
1136	1167	32	**sofie eng_data_err** (429)	–	–
1168	1199	32	**sofie sci_data_err** (462)	–	–
1200	1231	32	**sofie ssb_comm_err** (466)	–	–
1232	1263	32	**sofie cdh_queue_err** (401)	–	–
1264	1295	32	**sofie reserved9** (461)	–	–
1296	1327	32	**sofie reserved10** (458)	–	–
1328	1359	32	**sofie reserved11** (458)	–	–
1360	1391	32	**sofie reserved12** (459)	–	–

Packet **sofie system_data** Format, cont'd

start bit	stop bit	size bits	field		
1392	1423	32	**sofie ss_critical_err** (464)	–	–
1424	1455	32	**sofie ss_I_T_err** (463)	–	–
1456	1487	32	**sofie cdh_comm_err** (399)	–	–
1488	1519	32	**sofie ss_data_acq_err** (465)	–	–
1520	1551	32	**sofie ss_ST_Diag_err** (463)	–	–
1552	1583	32	**sofie ss_EH_FR_err** (462)	–	–
1584	1615	32	**sofie ss_cmndexec_err** (464)	–	–
1616	1647	32	**sofie point_stabil_err** (448)	–	–
1648	1679	32	**sofie steermirror_err** (471)	–	–
1680	1711	32	**sofie suntrack_err** (472)	–	–
1712	1743	32	**sofie ss_queue_err** (465)	–	–
1744	1775	32	**sofie reserved13** (459)	–	–
1776	1807	32	**sofie reserved14** (459)	–	–
1808	1839	32	**sofie reserved15** (460)	–	–
1840	1871	32	**sofie reserved16** (460)	–	–
1872	1903	32	**sofie reserved17** (460)	–	–
1904	1919	16	**sofie sync_ctrl_reg** (472)	–	–
1920	1931	12	**sofie sync_pulse_wdth1** (481)	–	–
1932	1935	4	**sofie sync_pulse_wdth2** (481)	–	–
1936	1951	16	**sofie sync_rise_ps_1** (481)	–	–
1952	1967	16	**sofie sync_rise_ps_2** (485)	–	–
1968	1983	16	**sofie sync_rise_ps_3** (486)	–	–
1984	1999	16	**sofie sync_rise_ps_4** (486)	–	–
2000	2015	16	**sofie sync_rise_ps_5** (487)	–	–
2016	2031	16	**sofie sync_rise_ps_6** (487)	–	–
2032	2047	16	**sofie sync_rise_ps_7** (488)	–	–
2048	2063	16	**sofie sync_rise_ps_8** (488)	–	–
2064	2079	16	**sofie sync_rise_ps_9** (489)	–	–
2080	2095	16	**sofie sync_rise_ps_10** (482)	–	–
2096	2111	16	**sofie sync_rise_ps_11** (482)	–	–
2112	2127	16	**sofie sync_rise_ps_12** (483)	–	–
2128	2143	16	**sofie sync_rise_ps_13** (483)	–	–
2144	2159	16	**sofie sync_rise_ps_14** (484)	–	–
2160	2175	16	**sofie sync_rise_ps_15** (484)	–	–
2176	2191	16	**sofie sync_rise_ps_16** (485)	–	–
2192	2207	16	**sofie sync_fall_ps_1** (473)	–	–
2208	2223	16	**sofie sync_fall_ps_2** (477)	–	–
2224	2239	16	**sofie sync_fall_ps_3** (477)	–	–
2240	2255	16	**sofie sync_fall_ps_4** (478)	–	–
2256	2271	16	**sofie sync_fall_ps_5** (478)	–	–
2272	2287	16	**sofie sync_fall_ps_6** (479)	–	–
2288	2303	16	**sofie sync_fall_ps_7** (479)	–	–
2304	2319	16	**sofie sync_fall_ps_8** (480)	–	–
2320	2335	16	**sofie sync_fall_ps_9** (480)	–	–
2336	2351	16	**sofie sync_fall_ps_10** (473)	–	–
2352	2367	16	**sofie sync_fall_ps_11** (474)	–	–
2368	2383	16	**sofie sync_fall_ps_12** (474)	–	–

Packet **sofie system_data** Format, cont'd

start bit	stop bit	size bits	field		
2384	2399	16	**sofie sync_fall_ps_13** (475)	–	–
2400	2415	16	**sofie sync_fall_ps_14** (475)	–	–
2416	2431	16	**sofie sync_fall_ps_15** (476)	–	–
2432	2447	16	**sofie sync_fall_ps_16** (476)	–	–
2448	5935	3488	**sofie freeformspace** (429)	–	–

Packet size = 5936 bits (742 bytes) .

F.6 sofie test_dump

Packet Source Application Identifier
0x185 (389)

OASIS Stream Name
sofie389

Description
sofie test dump packet

Discussion
SOFIE test dump packet. Default Packet Production Status: Packets produced asynchronously on command.

Format

Packet **sofie test_dump** Format

start bit	stop bit	size bits	field	control	method
0	15	16	**sofie p389pid** (447)	–	–
16	17	2	**sofie p389flg** (445)	–	–
18	31	14	**sofie p389sct** (447)	–	–
32	47	16	**sofie p389pl** (447)	–	–
48	63	16	**sofie p389hws** (445)	–	–
64	79	16	**sofie p389lws** (446)	–	–
80	95	16	**sofie p389hwss** (446)	–	–
96	111	16	**sofie p389lwss** (446)	–	–
112	127	16	**sofie type_identifier** (531)	–	–
128	143	16	**sofie OD_address** (388)	–	–
144	159	16	**sofie start_address** (471)	–	–
160	175	16	**sofie length** (430)	–	–
176	7679	7504	**sofie data_space** (415)	–	–

Packet size = 7680 bits (960 bytes) .

G

Telemetry Packet Summary

Telemetry Packet Summary

pkt no.	apid (hex)	packet
1	0x180 (384)	**sofie hk** (541)
2	0x181 (385)	**sofie sci** (545)
3	0x182 (386)	**sofie system_data** (556)
4	0x183 (387)	**sofie event_data** (540)
5	0x184 (388)	**sofie mem_dump** (544)
6	0x185 (389)	**sofie test_dump** (560)

H

Glossary

ACS *Attitude Control Subsytem* Spacecraft subsystem reponsible for spacecraft and instrument pointing.

ADC *analog/digital converter*

Aeronomy of Ice in the Mesosphere NASA mission to study the formation, morphology, and life cycle of polar mesospheric clouds (PMCs). These clouds are also called noctiluscent due to their tendency to 'glow' during the polar winter months. These clouds are so high in the atmosphere that their under sides (sides facing the earth) are illumniated by sunshine passing accross the pole through the atmosphere from the daylit side of the Earth.

B *byte* See byte

b *bit* See bit.

bit Basic unit of information storage.

BOS *bright object sensor* Hardware for sensing presence of bright objects (such as the sun).

byte 8 bits of storage. CCSDS uses the term *octet* instead.

CCSDS *Consultative Committee for Space Data Systems* An international organization of space agencies interested in mutually developing standard data handling techniques.

CDE *Cosmic Dust Experiment* One of the instruments comprising the AIM observatory, the CDE instrument helps scientists determine the amount of particles entering the atmosphere. This in turn helps them determine the impact of cosmic dust on PMC formation.

C&DH *command and data handling* Spacecraft subsystem that receives and processes commands, and produces telemetry. Typically the CDH also contains the flight computer.

CIPS *Cloud Imaging and Particle Size* One of the insruments comprising the AIM observatory, the CIPS instrument uses six CCDs to capture greyscale images of PMCs. These images will help scientists determine how these clouds are created, how they change over time, and what constitutes them.

CM *configuration management* Process of controlling access, identifying and archiving designated releases of software and documentation. CM is complementary to a version control system. See CVS.

command An instruction from a user (or script) to a spacecraft system to perform a specific action.

FSW *flight software* Embedded software that controls flight hardware.

glossary This is it.

high level command An instrument command that implements functionality of more than one low level command. High level commands are more efficient than low level commands for specifying complex instrument behavior.

HVPS *high voltage power supply* Device designed to provide unusually high voltages to electronics. Such devices are not only a safety hazard, but also can be hazardous to other hardware, should they arc, which is only a danger at low ambient pressures.

I/O *input output*

KB *kilobyte* 2^{10} = 1024 bytes.

Kb *kilobit* 2^{10} = 1024 bits.

LASP *Laboratory for Atmospheric and Space Physics* Institute at the University of Colorado, Boulder, researching atmospheric, space and planetary physics.

low level command An instrument command that implements a single basic hardware or software function.

MB *megabyte* 2^{20} = 1,048,576 bytes.

Mb *megabit* 2^{20} = 1,048,576 bits.

ms *milliseconds*

MIL-STD-1553 Military standard for flight serial data bus.

octet CCSDS term for an 8-bit unit of storage. See byte.

PDF *portable document format* Binary document format with self contained fonts that can be viewed or printed from most any platform via Adobe Acrobat and other PDF viewers. Advanced PDF viewers can navigate hyperlinks to other locations within and external to the document.

POR *power on reset* Hardware reset due to power cycle (transition from off to on). Hardware and software return to their POR states after a POR.

SSI *Standard Serial Interface* Interface electronics used for loading, monitoring, and debugging FSW.

TC *telecommand* CCSDS term for command. See CCSDS.

telemetry Data produced by a spacecraft application.

UT69R See UT69R000.

UT69R000 A radiation-hardened 16-bit RISC microcontroller created by UTMC. The 69R000 is the microconttroller host for FSW on all AIM instruments.

End of glossary.