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REGISTRAZIONE DELLE MODIFICHE / *CHANGE RECORD*

EDIZIONE <i>ISSUE</i>	DATA <i>DATE</i>	AUTORIZZAZIONE <i>CHANGE AUTHORITY</i>	OGGETTO DELLA MODIFICA E SEZIONI AFFETTE <i>REASON FOR CHANGE AND AFFECTED SECTIONS</i>
draft	5 February 2003		First issue
Draft2	20 March 2003		Revision of the document. All sections revised



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1. SCOPE

Scope of the document is to define the Telemetry packets to be transmitted by the DPU Boot program during the Application Software uploading, when a Data memory, Program memory, Eeprom memory error is detected.

The Boot program is in charge of uploading the Application program. The Application Program can be uploaded in two way; the nominal way is from EEPROM, the non-nominal way is by means the 1553 line. The Boot program will send a telemetry message to the OBDH via 1553 after an error detection.

Seven categories of telemetry messages have been designed to manage possible errors as follow:

- Program Memory test failure
- Data Memory test failure
- Eeprom memory test failure
- Tele-command failure
- EEPROM to Program Memory uploading failure
- Data Memory to Program Memory uploading failure
- FCS error

Besides an additional telemetry event packet to inform that the DPU is ready to accept the Telecommand has been included.

- Ready to accept Telecommand

In this document, the packet details are reported. For each telemetry packet a table packet format is presented. It is composed of four column. The first field is the field description according to the [AD XX] document. The second is the number of bits required. The third is the value of the related field. The fourth field includes comments and remarks about the current field.

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2. DOCUMENTS

2.1 APPLICABLE DOCUMENT

AD #	Doc Number	Issue/Date	Rev /Date	Title
1	CNR.IFSI.2000TR01	1 Sep 15, 2000		Documento di Specifiche Tecniche per il Contratto delle Data Processing Units del Satellite First dell'ESA" IFSI
2	DPU-SP-CGS-001	2 Oct 30, 2000		FIRST CPU Board Specification
3	DPU-SP-CGS-002	1 Oct 12, 2000		Payload & Spacecraft Interface Board Specification
4		Nov 30, 1999		Technical proposal CGS (Ref. S9-030 November 99)
5				Allegato Tecnico al Contratti ASI
6	CNR.IFSI.2001TR02	1 April 5, 2001		Herschel Space Observatory DPU Applicable Documents Guidelines
7	SCI-PT-ICD-7527	1 Sep 1, 2000	0	Packet Structure - Interface Control Document
8	IFSI-OBS-PL-2000	1 Oct 13, 2000		DPU/ICU OBS PA Plan
9	IFSI-OBS-SP-2000-001	1	3 April 6, 2000	DPU/ICU OBS URD, On Board S/W User Requirement Document
10	CNR.IFSI.2001TR01	Draft3 March 21, 2001		DPU/ICU Switch-ON Procedure
11	DPU-SQ-CGS-001	2 July 12,2001		DPU-BSW Requirement Document

2.2 REFERENCE DOCUMENT

N/A



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2.3 ACRONYMS

AD#	Applicable Document number #
BSP	Board Support Package
DPU	Data Processing Unit
DPU BSW	DPU Basic S/W
DM	Data Memory
DPR	Dual Port Ram
DSP	The 21020 DSP microprocessor
EDAC	Error Detector And Corrector
EEPROM	Electrically Erasable Programmable Read Only Memory
EM	Engineering Model
EPROM	Erasable Programmable Read Only Memory
EQM	Engineering Qualification Model
FIRST	Far Infra-Red and Sub-millimeter Telescope
FM	Flight Model
FS	Flight Spare
HIFI	Heterodyne Instrument for First
IFSI	Istituto per la Fisica dello Spazio Interplanetario
I/F	Interface
OBDH	On Board Data Handling
PA	Product Assurance
PACS	Photoconductor Array Camera and Spectrometer
PM	Program Memory
PROM	Programmable Read Only Memory
PL	Payload
RAM	Random Access Memory
RD#	Reference Document number #
SEU	Single Event Upset
S/C	Spacecraft
SPIRE	Spectral and Photometric Imaging Receiver



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3. PROGRAM MEMORY TEST

This packet is returned when a failure is detected during the Program Memory check. All the 512 program memory page are controlled and the addresses of failed pages are reported inside the packet.

<i>Field description</i>	<i>Number of bits</i>	<i>Value</i>	<i>Remarks</i>
Version number	3	0	
Telemetry Type	1	0	
Data Field Secondary header	1	1	
APID	11	PACS=0x480 HIFI =0x400 SPIRE=0x500	
Segmentation Flag	2	3	
Source sequence counter	14	Incremented by one	
Packet Length	16	Depending on packet length	
Spare	1	0	
PUS Version	3	0	
Spare	4	0	
Packet Type	8	5	
Packet Subtype	8	4	
Spare	8	0	
Course Time1	16	0x8000	
Course Time2	16	0	
Fine Time	16	0	
Event ID	16	0x8001	Program memory test packet (when an error is detected at least)
SID	16	0x00FF	Undetermined packet structure
MemType	2	1	Program Memory
Total Number Of pages Failed	14	Range 0-512	Total Number of Page Failed
Addresses of the Pages failed	16	Range 0-512	Addresses of the related pages failed. This field is repeated on the base of the total number of page
CRC/FCS	16		

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3.1 DATA MEMORY

This packet is returned when a failure is detected during the Data Memory check. All the 512 program memory page are controlled and the addresses of failed pages are reported inside the packet.

<i>Field Description</i>	<i>Number of bits</i>	<i>Value</i>	<i>Remarks</i>
Version number	3	0	
Telemetry Type	1	0	
Data Field Secondary header	1	1	
APID	11	PACS=0x480 HIFI =0x400 SPIRE=0x500	
Segmentation Flag	2	3	
Source sequence conter	14	Incremented by one	
Packet Length	16	Depending on packet length	
Spare	1	0	
PUS Version	3	0	
Spare	4	0	
Packet Type	8	5	
Packet Subtype	8	4	
Spare	8	0	
Course Time1	16	0x8000	
Course Time2	16	0	
Fine Time	16	0	
Event ID	16	0x8002	Data Memory test packet
SID	16	0x00FF	Undetermined packet structure
MemType	2	2	Data Memory
Number Of pages Failed	14	Range 0-512	Total Number of Page Failed
Addresses of the related Pages failed	16	Range 0-512	Address of the related page failed. This filed is repeated on the base of the total number of page
CRC	16		



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3.2 EEPROM MEMORY

The EEPROM memory is checked and the addresses of the failed page is reported inside the packet. The EEPROM page is declared in failure when the computed FCS on the EEPROM page is different the FCS inside the page header.

<i>Field Description</i>	<i>Number of bits</i>	<i>Value</i>	<i>Remarks</i>
Version number	3	0	
Telemetry Type	1	0	
Data Field Secondary header	1	1	
APID	11	PACS=0x480 HIFI =0x400 SPIRE=0x500	
Segmentation Flag	2	3	
Source sequence conter	14	Incremented by one	
Packet Length	16	Depending on packet length	
Spare	1	0	
PUS Version	3	0	
Spare	4	0	
Packet Type	8	5	
Packet Subtype	8	4	
Spare	8	0	
Course Time1	16	0x8000	
Course Time2	16	0	
Fine Time	16	0	
Event ID	16	0x8003	
SID	16	0x00FF	
MemType	2	3	EEPROM Memory
Number Of pages Failed	14	Range 0-0xFF	Total Number of Pages Failed;the check is done comparing the computed FCS on the page to the FCS inside the page header.
Number of the related Page failed	16	Range 0-0xFF	Address of the related page failed. This filed is repeated on the base of the total number of page
		0x101	Next Address out of range: the pointer to the next page is out of eeprom memory range
		0x102	Bad Index in the last page; The index in the last page is different then total number of pages
FCS/CRC	16		



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3.3 TELECOMMAND VALIDATION

3.3.1 TELECOMMAND FCS ERROR

<i>Field Description</i>	<i>Number of bits</i>	<i>Value</i>	<i>Remarks</i>
Version number	3	0	
Telemetry Type	1	0	
Data Field	1	1	
Secondary header			
APID	11	PACS=0x480 HIFI =0x400 SPIRE=0x500	
Segmentation Flag	2	3	
Source sequence conter	14	Incremented by one	
Packet Length	16	Depending on packet length	
Spare	1	0	
PUS Version	3	0	
Spare	4	0	
Packet Type	8	5	
Packet Subtype	8	4	
Spare	8	0	
Course Time1	16	0x8000	
Course Time2	16	0	
Fine Time	16	0	
Event ID	16	0x8004	
SID	16	0x0009	
MemType	16	0xAAAA	Not applicable
Error Code	16	0x0008	FCS error
FCS computed	16	Value computed	
FCS read	16	Value read	
Checksum ID	16	0x0002	Type of FCS error: FCS Tele-command error
DmStartAddress	16	0xAAAA	Not applicable
CRC	16	Value	



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3.3.2 APID COMMAND ERROR

<i>Field Description</i>	<i>Number of bits</i>	<i>Value</i>	<i>Remarks</i>
Version number	3	0	
Telemetry Type	1	0	
Data Field Secondary header	1	1	
APID	11	PACS=0x480 HIFI =0x400 SPIRE=0x500	
Segmentation Flag	2	3	
Source sequence conter	14	Incremented by one	
Packet Length	16	Depending on packet length	
Spare	1	0	
PUS Version	3	0	
Spare	4	0	
Packet Type	8	5	
Packet Subtype	8	4	
Spare	8	0	
Course Time1	16	0x8000	
Course Time2	16	0x0000	
Fine Time	16	0x0000	
Event ID	16	0x8004	
SID	16	0x0009	
MemType	16	APID Value	APID of the received TC packet
Error Code	16	0x000C	Telecommand APID error
FCS computed	16	0xAAAA	Not Applicable
FCS read	16	0xAAAA	Not Applicable
Checksum ID	16	0xAAAA	Not Applicable
DmStartAddress	16	0xAAAA	Not applicable
CRC	16	Value	

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3.3.3 TELECOMMAND DATA SEQUENCE CONTROL ERROR

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3.3.4 TELECOMMAND WRONG FUNCTION ID

<i>Field Description</i>	<i>Number of bits</i>	<i>Value</i>	<i>Remarks</i>
Version number	3	0	
Telemetry Type	1	0	
Data Field Secondary header	1	1	
APID	11	PACS=0x480 HIFI =0x400 SPIRE=0x500	
Segmentation Flag	2	3	
Source sequence conter	14	Incremented by one	
Packet Length	16	Depending on packet length	
Spare	1	0	
PUS Version	3	0	
Spare	4	0	
Packet Type	8	5	
Packet Subtype	8	4	
Spare	8	0	
Course Time1	16	0x8000	
Course Time2	16	0x0000	
Fine Time	16	0x0000	
Event ID	16	0x8004	
SID	16	0x0009	
MemType	16	Function ID	Function ID of the received Tc packet
Error Code	16	0x0010	Telecommand Wrong Function ID
FCS computed	16	0xAAAA	Not Applicable
FCS read	16	0xAAAA	Not Applicable
Checksum ID	16	0xAAAA	Not Applicable
DmStartAddress	16	0xAAAA	Not applicable
CRC	16	Value	



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3.3.5 TELECOMMAND PACKET TYPE ERROR:

<i>Field Description</i>	<i>Number of bits</i>	<i>Value</i>	<i>Remarks</i>
Version number	3	0	
Telemetry Type	1	0	
Data Field Secondary header	1	1	
APID	11	PACS=0x480 HIFI =0x400 SPIRE=0x500	
Segmentation Flag	2	3	
Source sequence conter	14	Incremented by one	
Packet Length	16	Depending on packet length	
Spare	1	0	
PUS Version	3	0	
Spare	4	0	
Packet Type	8	5	
Packet Subtype	8	4	
Spare	8	0	
Course Time1	16	0x8000	
Course Time2	16	0x0000	
Fine Time	16	0x0000	
Event ID	16	0x8004	
SID	16	0x0009	
MemType	16	Type and Subtype	Type and Subtype of the received TC packet
Error Code	16	0x000E	Telecommand PACKET TYPE error
FCS computed	16	0xAAAA	Not Applicable
FCS read	16	0xAAAA	Not Applicable
Checksum ID	16	0xAAAA	Not Applicable
DmStartAddress	16	0xAAAA	Not applicable
CRC	16	Value	



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3.3.6 TELECOMMAND PACKET SUBTYPE ERROR

<i>Field Description</i>	<i>Number of bits</i>	<i>Value</i>	<i>Remarks</i>
Version number	3	0	
Telemetry Type	1	0	
Data Field Secondary header	1	1	
APID	11	PACS=0x480 HIFI =0x400 SPIRE=0x500	
Segmentation Flag	2	3	
Source sequence conter	14	Incremented by one	
Packet Length	16	Depending on packet length	
Spare	1	0	
PUS Version	3	0	
Spare	4	0	
Packet Type	8	5	
Packet Subtype	8	4	
Spare	8	0	
Course Time1	16	0x8000	
Course Time2	16	0x0000	
Fine Time	16	0x0000	
Event ID	16	0x8004	
SID	16	0x0009	
MemType	16	Type & Subtype	Not applicable
Error Code	16	0x000B	Telecommand PACKET SUBTYPE error
FCS computed	16	0xAAAA	Not Applicable
FCS read	16	0xAAAA	Not Applicable
Checksum ID	16	0xAAAA	Not Applicable
DmStartAddress	16	0xAAAA	Not applicable
CRC	16	Value	



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3.3.7 TELECOMMAND DATA MEMORY PAGE OVERLAPPED

Field Description	Number of bits	Value	Remarks
Version number	3	0	
Telemetry Type	1	0	
Data Field	1	1	
Secondary header			
APID	11	PACS=0x480 HIFI =0x400 SPIRE=0x500	
Segmentation Flag	2	3	
Source sequence conter	14	Incremented by one	
Packet Length	16	Depending on packet length	
Spare	1	0	
PUS Version	3	0	
Spare	4	0	
Packet Type	8	5	
Packet Subtype	8	4	
Spare	8	0	
Course Time1	16	0x8000	
Course Time2	16	0x0000	
Fine Time	16	0x0000	
Event ID	16	0x8004	
SID	16	0x0009	
Option	4	0xAAAA	Not Applicable
Status	4		
Num TC	8		
Error Code	16	0x000A	Telecommand OVERLAPPED error; when two pages are overlapped
FCS computed	16	0xAAAA	Not Applicable
FCS read	16	0xAAAA	Not Applicable
Checksum ID	16	0xAAAA	Not Applicable
DmStartAddress	16	Value	Start address of the overlapped memory page (the address has to be multiply by 8)
CRC	16	Value	



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3.3.8 TELECOMMAND DATA MEMORY PAGE LOST

<i>Field Description</i>	<i>Number of bits</i>	<i>Value</i>	<i>Remarks</i>
Version number	3	0	
Telemetry Type	1	0	
Data Field Secondary header	1	1	
APID	11	PACS=0x480 HIFI =0x400 SPIRE=0x500	
Segmentation Flag	2	3	
Source sequence conter	14	Incremented by one	
Packet Length	16	Depending on packet length	
Spare	1	0	
PUS Version	3	0	
Spare	4	0	
Packet Type	8	5	
Packet Subtype	8	4	
Spare	8	0	
Course Time1	16	0x8000	
Course Time2	16	0x0000	
Fine Time	16	0x0000	
Event ID	16	0x8004	
SID	16	0x0009	
Option	4	0x4 0x3 0x2 0x1	Loading First page Loading intermediate pages Loading page set completed Loading all pages completed
Status	4	0xF 0x8 0x3	First Telecommand Last Telecommand Intermediate Telecommand to upload a memory page
Num TC	8	0 – 0x11	Index of Telecommand inside the page
Error Code	16	0x0009	Telecommand PAGE LOST error; when two pages are overlapped
FCS computed	16	0xAAAA	Not Applicable
FCS read	16	0xAAAA	Not Applicable
Checksum ID	16	0xAAAA	Not Applicable
DmStartAddress	16	Value	Start address of the overlapped memory page (the address has to be multiply by 8)
CRC	16	Value	



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3.3.9 TELECOMMAND DATA MEMORY FCS ERROR

<i>Field Description</i>	<i>Number of bits</i>	<i>Value</i>	<i>Remarks</i>
Version number	3	0	
Telemetry Type	1	0	
Data Field Secondary header	1	1	
APID	11	PACS=0x480 HIFI =0x400 SPIRE=0x500	
Segmentation Flag	2	3	
Source sequence conter	14	Incremented by one	
Packet Length	16	Depending on packet length	
Spare	1	0	
PUS Version	3	0	
Spare	4	0	
Packet Type	8	5	
Packet Subtype	8	4	
Spare	8	0	
Course Time1	16	0x8000	
Course Time2	16	0x0000	
Fine Time	16	0x0000	
Event ID	16	0x8004	
SID	16	0x0009	
Option	4	0x4 0x3 0x2 0x1	Loading First page Loading intermediate pages Loading page set completed Loading all pages completed
Status	4	0xF 0x8 0x3	First Telecommand Last Telecommand Intermediate Telecommand to upload a memory page
Num TC	8	0 – 0x11	Index of Telecommand inside the page
Error Code	16	0x0008	Telecommand FCS Error
FCS computed	16	Value	Computed on the Data Block
FCS read	16	Value	Read inside the command packet
Checksum ID	16	0x0001	FCS Data Block error in the Telecommand
DmStartAddress	16	Value	Start address of the overlapped memory page (the address has to be multiplied by 8)
FCS/CRC	16	Value	



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3.3.10 TELECOMMAND DATA MEMORY WRONG FORMAT

Field Description	Number of bits	Value	Remarks
Version number	3	0	
Telemetry Type	1	0	
Data Field	1	1	
Secondary header			
APID	11	PACS=0x480 HIFI =0x400 SPIRE=0x500	
Segmentation Flag	2	3	
Source sequence conter	14	Incremented by one	
Packet Length	16	Depending on packet length	
Spare	1	0	
PUS Version	3	0	
Spare	4	0	
Packet Type	8	5	
Packet Subtype	8	4	
Spare	8	0	
Course Time1	16	0x8000	
Course Time2	16	0x0000	
Fine Time	16	0x0000	
Event ID	16	0x8004	
SID	16	0x0009	
Option	4	0x4 0x3 0x2 0x1	Loading First page Loading intermediate pages Loading page set completed Loading all pages completed
Status	4	Value different then 0xF 0x8 0x3	First Telecommand Last Telecommand Intermediate Telecommand to upload a memory page
Num TC	8	0 – 0x11	Index of Telecommand inside the page
Error Code	16	0x0007	Telecommand WRONG FORMAT
FCS computed	16	0xAAAA	Not Applicable
FCS read	16	0xAAAA	Not Applicable
Checksum ID	16	0xAAAA	Not Applicable
DmStartAddress	16	Value	Start address of the overlapped memory page (the address has to be multiplied by 8)
FCS/CRC	16	Value	



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3.3.11 TELECOMMAND DATA MEMORY WRONG FUNCTION

Field Description	Number of bits	Value	Remarks
Version number	3	0	
Telemetry Type	1	0	
Data Field Secondary header	1	1	
APID	11	PACS=0x480 HIFI =0x400 SPIRE=0x500	
Segmentation Flag	2	3	
Source sequence conter	14	Incremented by one	
Packet Length	16	Depending on packet length	
Spare	1	0	
PUS Version	3	0	
Spare	4	0	
Packet Type	8	5	
Packet Subtype	8	4	
Spare	8	0	
Course Time1	16	0x8000	
Course Time2	16	0x0000	
Fine Time	16	0x0000	
Event ID	16	0x8004	
SID	16	0x0009	
Option	4	0x4 0x3 0x2 0x1	Loading First page Loading intermediate pages Loading page set completed Loading all pages completed
Status	4	Value different then 0xF 0x8 0x3	First Telecommand Last Telecommand Intermediate Telecommand to upload a memory page
Num TC	8	0 – 0x11	Index of Telecommand inside the page
Error Code	16	0x0010	Telecommand WRONG FUNCTION (Function ID different then 0x70)
FCS computed	16	0xAAAA	Not Applicable
FCS read	16	0xAAAA	Not Applicable
Checksum ID	16	0xAAAA	Not Applicable
DmStartAddress	16	0xAAAA	Not Applicable
FCS/CRC	16	Value	



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3.3.12 TC DM UPLOADING BOUNDARIES ERROR

<i>Field Description</i>	<i>Number of bits</i>	<i>Value</i>	<i>Remarks</i>
Version number	3	0	
Telemetry Type	1	0	
Data Field Secondary header	1	1	
APID	11	PACS=0x480 HIFI =0x400 SPIRE=0x500	
Segmentation Flag	2	3	
Source sequence conter	14	Incremented by one	
Packet Length	16	Depending on packet length	
Spare	1	0	
PUS Version	3	0	
Spare	4	0	
Packet Type	8	5	
Packet Subtype	8	4	
Spare	8	0	
Course Time1	16	0x8000	
Course Time2	16	0x0000	
Fine Time	16	0x0000	
Event ID	16	0x8004	
SID	16	0x0009	
Memory Type	16	0XAAAA	
Error Code	16	0x0012	DM Uploading boundaries error
FCS computed	16	0xAAAA	Not Applicable
FCS read	16	0xAAAA	Not Applicable
Checksum ID	16	0xAAAA	Not Applicable
DmStartAddress	16	0xAAAA	Not Applicable
FCS/CRC	16	Value	



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3.3.13 TELECOMMAND DATA MEMORY WRONG ACTIVITY

Field Description	Number of bits	Value	Remarks
Version number	3	0	
Telemetry Type	1	0	
Data Field Secondary header	1	1	
APID	11	PACS=0x480 HIFI =0x400 SPIRE=0x500	
Segmentation Flag	2	3	
Source sequence conter	14	Incremented by one	
Packet Length	16	Depending on packet length	
Spare	1	0	
PUS Version	3	0	
Spare	4	0	
Packet Type	8	5	
Packet Subtype	8	4	
Spare	8	0	
Course Time1	16	0x8000	
Course Time2	16	0x0000	
Fine Time	16	0x0000	
Event ID	16	0x8004	
SID	16	0x0009	
Option	4	0x4 0x3 0x2 0x1	Loading First page Loading intermediate pages Loading page set completed Loading all pages completed
Status	4	Value different then 0xF 0x8 0x3	First Telecommand Last Telecommand Intermediate Telecommand to upload a memory page
Num TC	8	0 – 0x11	Index of Telecommand inside the page
Error Code	16	0x0011	Telecommand WRONG ACTIVITY ID (Activity ID different then 0x05,0x06,0x07)
FCS computed	16	0xAAAA	Not Applicable
FCS read	16	0xAAAA	Not Applicable
Checksum ID	16	0xAAAA	Not Applicable
DmStartAddress	16	0xAAAA	Not Applicable
FCS/CRC	16	Value	



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3.4 LOADING EEPROM TO PM

<i>Field Description</i>	<i>Number of bits</i>	<i>Value</i>	<i>Remarks</i>
Version number	3	0	
Telemetry Type	1	0	
Data Field Secondary header	1	1	
APID	11	PACS=0x480 HIFI =0x400 SPIRE=0x500	
Segmentation Flag	2	3	
Source sequence conter	14	Incremented by one	
Packet Length	16	Depending on packet length	
Spare	1	0	
PUS Version	3	0	
Spare	4	0	
Packet Type	8	5	
Packet Subtype	8	4	
Spare	8	0	
Course Time1	16	0x8000	
Course Time2	16	0	
Fine Time	16	0	
Event ID	16	0x8005	
SID	16	0x0001	
MemType	2	3	EEPROM Memory
Number Of pages Failed	14	0x0001	
Error Code	16	0x400	No Partition to Boot. When primary and secondary partition are corrupted
		0x800	Total FCS error. The computed FCS on the whole program is wrong.
		0xC00	A Program memory FCS error is detected during the page upload.
		0x1400	Previous EEPROM test failed
		0x1800	Overlapping between two program memory pages
FCS/CRC	16		



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3.5 LOADING DM TO PM

<i>Field Description</i>	<i>Number of bits</i>	<i>Value</i>	<i>Remarks</i>
Version number	3	0	
Telemetry Type	1	0	
Data Field Secondary header	1	1	
APID	11	PACS=0x480 HIFI =0x400 SPIRE=0x500	
Segmentation Flag	2	3	
Source sequence counter	14	Incremented by one	
Packet Length	16	Depending on packet length	
Spare	1	0	
PUS Version	3	0	
Spare	4	0	
Packet Type	8	5	
Packet Subtype	8	4	
Spare	8	0	
Course Time1	16	0x8000	
Course Time2	16	0	
Fine Time	16	0	
Event ID	16	0x8006	
SID	16	0x0001	
MemType	2	0x2	DM Memory
Number Of pages Failed	14	0x0001	
Error Code	16	0xC00	A Program memory FCS error is detected during the page upload.
		0x1800	Overlapping between two program memory pages
		0x1900	PM memory page boundaries uploading error
FCS/CRC	16		



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3.6 PROGRAM FCS ERROR DURING THE DM TO PM IMMEDIATE BOOT

<i>Field Description</i>	<i>Number of bits</i>	<i>Value</i>	<i>Remarks</i>
Version number	3	0	
Telemetry Type	1	0	
Data Field Secondary header	1	1	
APID	11	PACS=0x480 HIFI =0x400 SPIRE=0x500	
Segmentation Flag	2	3	
Source sequence counter	14	Incremented by one	
Packet Length	16	Depending on packet length	
Spare	1	0	
PUS Version	3	0	
Spare	4	0	
Packet Type	8	5	
Packet Subtype	8	4	
Spare	8	0	
Course Time1	16	0x8000	
Course Time2	16	0	
Fine Time	16	0	
Event ID	16	0x8007	
SID	16	0x0001	
MemType	2	0x1	PM Memory
Number Of pages Failed	14	0x0001	
Error Code	16	0x800	Program FCS error. The computed FCS on the whole program is wrong.
FCS/CRC	16		



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3.7 READY TO ACCEPT TELECOMMANDS

<i>Field Description</i>	<i>Number of bits</i>	<i>Value</i>	<i>Remarks</i>
Version number	3	0	
Telemetry Type	1	0	
Data Field Secondary header	1	1	
APID	11	PACS=0x480 HIFI =0x400 SPIRE=0x500	
Segmentation Flag	2	3	
Source sequence counter	14	Incremented by one	
Packet Length	16	Depending on packet length	
Spare	1	0	
PUS Version	3	0	
Spare	4	0	
Packet Type	8	5	
Packet Subtype	8	2	
Spare	8	0	
Course Time1	16	0x8000	
Course Time2	16	0	
Fine Time	16	0	
Event ID	16	0x8008	
SID	16	0x0003	
Number of attempting to read Eeprom pages	16	0- 0x3200	
FCS/CRC	16		