CCR Number: 0031	CRITICALITY: ROUTINE	DUE:06/25/99

DISTRIBUTION SHEET

EO-1 LEVEL II CCB

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NEW MILLENNIUM PROJECT CONFIGURATION CHANGE REQUEST

PROGRAM EO-1	TITLE CHANGES TO EO-1 HYPERION ICD-65
CCR NO. 0031	ORIGINATOR P. Spidaliere/GSFC
DATE INITIATED 06/03/99	ORIGINATOR'S CHG. NO. TRW-Change 001 (Paul Lee)
	SPONSOR/CODE P. Spidaliere PHONE x4797

EFFECTIVITY

ITEM: EO-1
S / N

ITEM:
S / N

ITEM:
S / N

CHANGE CLASS

	I	II
PRELIMINARY	☐	☐
FORMAL	☐	☐

TYPE OF CHANGE

MILESTONE	☐	INTERFACE	☐	SOFTWARE	☐
DOCUMENT	☒	POWER	☐	OTHER	☐
COST	☐	WEIGHT	☐		☐

DOCUMENTS OR SOFTWARE AFFECTED

EO-1-ICD-65

PROBLEM

The attached Preliminary Interface Revision Notice (PIRN) contains changes to EO-1 Hyperion ICD-065. Approval of this CCR/PIRN will authorize the incorporation of suggested changes into ICD-65.

PROPOSED SOLUTION

Approve the attached PIRN 001 into ICD-65, EO-1 Hyperion Instrument ICD by the EO-1 Level II Configuration Control Board (CCB). The signed PIRN will serve as the official approval of changes to this ICD. Future changes will be initiated by submittal of Configuration Change Requests (CCRs) and PIRN for CCB approval. this document is maintained by EO-1 Configuration Management Office (EO-1).

BOARD ACTION		APPROVAL LEVEL REQUIRED		CRITICALITY LEVEL		PROCUREMENT CHANGE ORDER CLASSIFICATION					
APPROVE	☑	LEVEL I HQS	☐	EMERGENCY	☐	ROUTINE		URGENT		EMERGENCY	☐
APPROVE WITH CHANGE	☐	LEVEL II GSFC	☒	URGENT	☐	OPTION 1	☐	OPTION 1	☐		
DISAPPROVE	☐	LEVEL III	☐	ROUTINE	☒	OPTION 2	☐	OPTION 2	☐		
WITHDRAW	☐										

COMMENTS

Approve to incorporate PIRN 001 into ICD-65, Hyperion ICD.

CHAIRPERSON [signature] DATE 28 Jun 99

3/28/96

GODDARD SPACE FLIGHT CENTER	1. PAGE 1 OF 8
PRELIMINARY REQUIREMENTS CHANGE NOTICE (PSCN) No. **001**	2. INIT. DATE: 06/03/99
or **PRELIMINARY INTERFACE REVISION NOTICE (PIRN)** No. ____	3. CONTRACT NUMBER

4. ASSOCIATED CONTROL NUMBERS: **EO-1CCR 0031**	5. CI'S AFFECTED: ICD-65 HYPERION	6. DOCUMENT NUMBER: REVISION:

7. DESCRIPTION OF CHANGE:

1. (See attached)

PREPARED BY: S.Schneider/EO-1 CMO	ORIGINATING ORGANIZATION APPROVAL:	ORGANIZATION:	DATE:
HST CCB ACTION APPROVE X DISAPPROVE	SIGNATURE:	DATE: 28 Jun 99 MINUTES No:	

1) Section 1.1.5 Drawings: Add: "-1" to the following drawing number:

868800

2) Section 1.5.1 Drawings: Add: The following to section:

868590-1 Hyperion Sensor Assembly, EO-1

868650-1 Hyperion Cryocooler Electronics Assembly

868648-1 Hyperion Cable Assembly

3)Section 3.2 Hyperion Sensor Assembly (HAS) Description:

From: "The VNIR focal plane is operated at ~~293~~ k (~~20~~ OC) and is thermally attached to the VNIR radiator."

To: "The VNIR focal plane is operated at **273** k (OC) and is thermally attached to the VNIR radiator."

4)Figure 3.3-1 Hyperion Power and Control Electronics Assembly (HEA) Interfcace:

Change From: (Drawing 868649-1, Hyperion electronics assembly)

To: (Drawing 868649**-1**, Hyperion electronics assembly)

5)Figure 3.4-1 Hyperion Cryocooler Control Electronics Assembly (CEA) Interface

Change From: (Drawing 868652, Cryocooler Control Electronics- Model Hyperion, ICD)

To: (Drawing 868652**-1**, Cryocooler Control Electronics- Model Hyperion, ICD)

6) Add: The following at the beginning of Section 4.10 Aperture Cover Operation and Uncompensated Angular Momentum:

"**The maximum aperture cover rotational inertia and angular velocity are 6.05 kg-cm and 0.16 radian/sec.**"

7) Change Section 7.1.5.2 SWIR Image Data Format:

From:

The Hyperion SWIR Focal Plane, FPE and ASP are being fabricated to SSTI/H S I Equipment Specification EQ3-056 "Equipment Specification for the H S I SWIR Focal Plane Array".

To:

The Hyperion SWIR Focal Plane, FPE and ASP are being fabricated ~~to SSTI/H S I~~ Equipment Specification EQ3-056 "Equipment Specification for the H S I SWIR Focal Plane Array".

8) Change Table 12.1.1-1a Flight Limit Loads Factors for the H S A:

From:

Table 12.1.2.1-1a Flight Limit Loads Factors for the HSA

Case 1	4.1 g axial compression + 11 g in any lateral direction (TBR)
Case 2	1.0 g axial tension + 11.0 g in any lateral direction (TBR)
Case 3	7.9 g axial compression + 0.1 g in any lateral direction (TBR)
Note: 1. Axial direction is parallel to the EO-1 satellite Z-axis 2. The axial and lateral limit load factors are to be applied simultaneously 3. Compression is the acceleration sense that produces compression at the spacecraft interface	

To:

Table 12.1.2.1-1a Flight Limit Loads Factors for the HSA

Case 1	**3.8** g axial compression **+/- 7.3** g in any lateral direction
Case 2	1.0 g axial tension +/- 7.3 g in any lateral direction
Case 3	**8.1** g axial compression **+/- 1.1** g in any lateral direction
Note: 1. Axial direction is parallel to the EO-1 satellite Z-axis 2. The axial and lateral limit load factors are to be applied simultaneously 3. Compression is the acceleration sense that produces compression at the spacecraft interface	

9) Change the last sentence in Section 14.4.1 Transportation Requirements:

From : The shipping container shall be instrumented to record maximum accelerations in all three axes as specified (TBD).

To: The shipping container shall **have 20 g shock indicators** to record maximum accelerations in all three axis.

10) Change Table A1.1.3-1 CEA J101 M24308/4-1(9P) Connector Pin Assignment:

From:

Table A1.1.3-1 CEA J101, M24308/4-1(9P), Connector Pin Assignment

Pin #	Signal Name	Description
1	CHGND	Chasis ground
2	PWRA+	+28V A Bus (Common with HEA J101-1,2)
3	PWRA+	+28V A Bus (Common with HEA J101-1,2)
4	PWRB-	
5	PWRB-	
6	PWRB+	
7	PWRB+	
8	PWRA-	+28V A Bus Return (Common with HEA J101-6,7)
9	PWRA-	+28V A Bus (Common with HEA J101-6,7)

To:

Table A1.1.3-1 CEA J101, M24308/4-1(9P), Connector Pin Assignment

Pin #	Signal Name	Description
1	CHGND	Chasis ground
2	**28V RTN**	+28V Bus **Return** (Common with HEA J101-**6,7**)
3	**28V RTN**	+28V Bus **Return** (Common with HEA J101-**6,7**)
4	**28V RTN**	**+28V Bus Return (Common with HEA J101-6,7)**
5	**28V RTN**	**+28V Bus Return (Common with HEA J101-6,7**)
6	**+28V**	**+28V S/C Bus (Common with HEA J101-1,2)**
7	**+28V**	**+28V S/C Bus (Common with HEA J101-1,2)**
8	**+28V**	+28V **S/C** Bus (Common with HEA J101-**1,2**)
9	**+28V**	+28V **S/C** Bus (Common with HEA J101-**1,2**)

11) Change A2.3 Telemetry Packet

<u>From:</u>

A2.3 Telemetry Packet

Most Significant Bits

Description	15	14	13	12	11	10	9	8	7	6	5	4
Semaphore	Semaphore (zero or unchanged means no new packet)											
Packet header 1	Version Number			Type	Sec. Header	Application Process ID						
Packet header 2	Segment Flags		Source Sequence Count									
Packet header 3	Packet Length											
Secondary Hdr1	Time code: Most Significant Word											
Secondary Hdr2												
Secondary Hdr3												
Secondary Hdr4	Time code: Least Significant Word											
Status	Spare	Collect Cryo telem 1 = on	Cover Status 0 = closed 1 = calibrate 2 = open		Data Collect	Standby	Watch-Dog Reset	SC Reset	Heater7 1 = On	Heater6 1 = On	Heater5 1 = On	Heater4 1 = On
Heater 0 Min	Not Used				+X Panel Heater Minimum temperature setpoint							
Heater 0 Max	Not Used				+X Panel Heater Maximum temperature setpoint							
Heater 1 Min	Not Used				-+Y Panel Heater Minimum temperature setpoint							
Heater 1 Max	Not Used				+Y Panel Heater Maximum temperature setpoint							
Heater 2 Min	Not Used				-X & - Y Panel Heater Minimum temperature setpoint							
Heater 2 Max	Not Used				-X & -Y Panel Heater Maximum temperature setpoint							
Heater 3 Min	Not Used				Top Panel Heater Minimum temperature setpoint							
Heater 3 Max	Not Used				Top Panel Heater Maximum temperature setpoint							
Heater 4 Min	Not Used				Bottom Panel Heater Minimum temperature setpoint							
Heater 4 Max	Not Used				Bottom Panel Heater Maximum temperature setpoint							
Heater 5 Min	Not Used				VNIR ASP Heater Minimum temperature setpoint							
Heater 5 Max	Not Used				VNIR ASP Heater Maximum temperature setpoint							
Heater 6 Min	Not Used				SWIR ASP Heater Minimum temperature setpoint							
Heater 6 Max	Not Used				SWIR Heater Maximum temperature setpoint							
Heater 7 Min	Not Used				Heater #7 Minimum temperature setpoint							
Heater 7 Max	Not Used				Heater #7 Maximum temperature setpoint							
Cal Lamp 1 Value									In-Flight Calibration Lamp			
Cal Lamp 2 Value									In-Flight Calibration Lamp			
Cal Lamp 1 Current	Not Used				In-Flight Calibration Lamp 1 Current							
Cal Lamp 2 Current	Not Used				In-Flight Calibration Lamp 2 Current							
Cal Lamp 1 Voltage	Not Used				In-Flight Calibration Lamp 1 Voltage							
Cal Lamp 2 Voltage	Not Used				In-Flight Calibration Lamp 2 Voltage							
HSA Temp1	Not Used				+ X Panel Temperature							
HSA Temp2	Not Used				+Y Panel Temperature							
HSA Temp3	Not Used				-X & -Y Panel Temperature							
HSA Temp4	Not Used				Top Panel Temperature							
HSA Temp5	Not Used				Bottom Panel Temperature							
HSA Temp6	Not Used				VNIR ASP Temperature							
HSA Temp7	Not Used				VNIR ASP Temperature							
HSA Temp8	Not Used				SWIR ASPTemperature							
Spare Temp	Not Used				Spare Temperature							
Spare Temp	Not Used				Spare Temperature							
Spare Temp	Not Used				Spare Temperature							
OMS Temp	Not Used				OMS Temperature							

Baffle Temp	Not Used	Baffle Temperature
Cooler Temp	Not Used	Cooler Temperature
VNIR FPGA Temp	Not Used	VNIR FPGA Temperature
HPE Temp	Not Used	HPE Temperature
HEA +5V	Not Used	HEA +5V
HEA +15V	Not Used	HEA +15V
HEA –15V	Not Used	HEA –15V
VNIR +5VD	Not Used	VNIR +5VD
VNIR +5VA	Not Used	VNIR +5VA
VNIR –5VA	Not Used	VNIR –5VA
VNIR +15VA	Not Used	VNIR +15VA
VNIR –15VA	Not Used	VNIR –15VA
SWIR +5VD	Not Used	SWIR +5VD
SWIR +5VA	Not Used	SWIR +5VA
SWIR –5VA	Not Used	SWIR –5VA
SWIR +15V	Not Used	SWIR +15V
SWIR –15V	Not Used	SWIR –15V
Cover Position	Not Used	Cover Position
Spare Analog Telem	Not Used	Spare Analog Telemetry
SWIR Param 1	SWIR Offset B (Range 0 to 255)	SWIR Offset A (Range 0 to 255)
SWIR Param 2	SWIR Offset D (Range 0 to 255)	SWIR Offset C (Range 0 to 255)
SWIR Param 3	SWIR Integration Time	SWIR Gain D (0-3) / SWIR Gain C (0-3)
VNIR Parameters	VNIR Offset D (Range 0 to 15) / VNIR Offset C (Range 0 to 15)	VNIR Offset B (Range 0 to 15)
Peek Offset	Offset Address from peek command	
Peek Segment	Segment Address from peek command	
Peek Data Low	Least significant word of peek data	
Peek Data High	Most significant word of peek data	
Counters	Error counter	Command
Command Buffer 0	Most recently received command opcode	
Command Buffer 1		
Command Buffer 2		
Command Buffer 3	Fifth most recently received command opcode	
Error Buffer 0	Most recently recorded error condition	
Error Buffer 1	Second most recently recorded error condition	
Cryocooler Telem Semaphore	Cryocooler telemetry semaphore (zero or unchanged means no new cryocooler telemetry packet)	
Cryocooler Telem 0	0xEB90	
Cryocooler Telem 1	0x0430	
Cryocooler Telem 2	0x1002	

To:

A2.3 Telemetry Packet

Most Significant Bits

Description	15	14	13	12	11	10	9	8	7	6	5	4
Semaphore	Semaphore (zero or unchanged means no new packet)											
Packet header 1	Version Number			Type	Sec. Header	Application Process ID						
Packet header 2	Segment Flags		Source Sequence Count									
Packet header 3	Packet Length											
Secondary Hdr1	Time code: Most Significant Word											
Secondary Hdr2												
Secondary Hdr3												
Secondary Hdr4	Time code: Least Significant Word											
Status	Spare	Collect Cryo telem 1 = on	Cover Status 0 = closed 1 = calibrate 2 = open		Data Collect	Standby	Watch-Dog Reset	SC Reset	Heater7 1 = On	Heater6 1 = On	Heater5 1 = On	Heater4 1 = On
Heater 0 Min	Not Used				+ Y Panel Heater Minimum temperature setpoint							
Heater 0 Max	Not Used				+ Y Panel Heater Maximum temperature setpoint							

Heater 1 Min	Not Used		-Y Panel Heater Minimum temperature setpoint	
Heater 1 Max	Not Used		-Y Panel Heater Maximum temperature setpoint	
Heater 2 Min	Not Used		-X Panel Heater Minimum temperature setpoint	
Heater 2 Max	Not Used		-X Panel Heater Maximum temperature setpoint	
Heater 3 Min	Not Used		GIS Heater Minimum temperature setpoint	
Heater 3 Max	Not Used		GIS Heater Maximum temperature setpoint	
Heater 4 Min	Not Used		VNIR ASP Heater Minimum temperature setpoint	
Heater 4 Max	Not Used		VNIR ASP Heater Maximum temperature setpoint	
Heater 5 Min	Not Used		SWIR ASP Heater Minimum temperature setpoint	
Heater 5 Max	Not Used		SWIR ASP Heater Maximum temperature setpoint	
Heater 6 Min	Not Used		Heater #6 Minimum temperature setpoint	
Heater 6 Max	Not Used		Heater #6 Maximum temperature setpoint	
Heater 7 Min	Not Used		Heater #7 Minimum temperature setpoint	
Heater 7 Max	Not Used		Heater #7 Maximum temperature setpoint	
Cal Lamp 1 Value	Not Used			In-Flight Calibration Lamp
Cal Lamp 2 Value	Not Used			In-Flight Calibration Lamp
Cal Lamp 1 Current	Not Used		In-Flight Calibration Lamp 1 Current	
Cal Lamp 2 Current	Not Used		In-Flight Calibration Lamp 2 Current	
Cal Lamp 1 Voltage	Not Used		In-Flight Calibration Lamp 1 Voltage	
Cal Lamp 2 Voltage	Not Used		In-Flight Calibration Lamp 2 Voltage	
HSA Temp1	Not Used		+ Y Panel Temperature	
HSA Temp2	Not Used		-Y Panel Temperature	
HSA Temp3	Not Used		-X Panel Temperature	
HSA Temp4	Not Used		GIS Temperature	
HSA Temp5	Not Used		VNIR ASP Temperature	
HSA Temp6	Not Used		SWIR ASP Temperature	
HSA Temp7	Not Used		Spare Temperature	
HSA Temp8	Not Used		Spare Temperature	
Spare Temp	Not Used		+X Panel Temperature	
Spare Temp	Not Used		VNIR FPE Temperature	
Spare Temp	Not Used		SWIR FPE Temperature	
OMS Temp	Not Used		Motor Temperature	
Baffle Temp	Not Used		LVDT Temperature	
Cooler Temp	Not Used		Cooler Temperature	
VNIR FPGA Temp	Not Used		VNIR FPGA Temperature	
HPE Temp	Not Used		HPE Temperature	
HEA +5V	Not Used		HEA +5V	
HEA +15V	Not Used		HEA +15V	
HEA –15V	Not Used		HEA –15V	
VNIR +5VD	Not Used		VNIR +5VD	
VNIR +5VA	Not Used		VNIR +5VA	
VNIR –5VA	Not Used		VNIR –5VA	
VNIR +15VA	Not Used		VNIR +15VA	
VNIR –15VA	Not Used		VNIR –15VA	
SWIR +5VD	Not Used		SWIR +5VD	
SWIR +5VA	Not Used		SWIR +5VA	
SWIR –5VA	Not Used		SWIR –5VA	
SWIR +15V	Not Used		SWIR +15V	
SWIR –15V	Not Used		SWIR –15V	
Cover Position	Not Used		Cover Motor Position	
+12V	Not Used		Cal Lamp +12V	
Spare Analog Telem	Not Used		Spare Analog Telemetry	
SWIR Param 1	SWIR Offset B (Range 0 to 255)		SWIR Offset A (Range 0 to 255)	
SWIR Param 2	SWIR Offset D (Range 0 to 255)		SWIR Offset C (Range 0 to 255)	
SWIR Param 3	SWIR Integration Time		SWIR Gain D (0-3)	SWIR Gain C (0-3)
VNIR Parameters	VNIR Offset D (Range 0 to 15)	VNIR Offset C (Range 0 to 15)	VNIR Offset B (Range 0 to 15)	
Peek Offset	Offset Address from peek command			
Peek Segment	Segment Address from peek command			
Peek Data Low	Least significant word of peek data			
Peek Data High	Most significant word of peek data			
Counters	Error counter			Command
Command Buffer 0	Most recently received command opcode			

Command Buffer 1	
Command Buffer 2	
Command Buffer 3	**Fourth** most recently received command opcode
Error Buffer 0	Most recently recorded error condition
Error Buffer 1	Second most recently recorded error condition
Cryocooler Telem Semaphore	Cryocooler telemetry semaphore (zero or unchanged means no new cryocooler telemetry packet)
Cryocooler Telem 0	0xEB90
Cryocooler Telem 1	0x0430
Cryocooler Telem 2	0x1002

12) Change Section A2.5 Hyperion Cryocooler Command List:

From:

The complete Hyperion cryocooler command list is documented in D26977, TES FPC Control Software: Architecture and Software User's Manual, p.32-182.

To:

The complete Hyperion cryocooler command list is documented in D2**7802**, **Hyperion MPT Cryocooler** Control Software: Architecture and Software User's Manual, p.**2**2-1**54**.

13) Change Section A2.7 Hyperion Cryocooler Telemetry List:

From:

The complete Hyperion cryocooler telemetry lis is documented in D26977, TES FPC Control Software: Architecture and Software User's Manual, p. 185-205.

The complete Hyperion cryocooler telemetry lis is documented in D2**7802**, **Hyperion MPT Cryocooler** Control Software: Architecture and Software User's Manual, p. 1**5**5-**176**.