Doc No. :PT-HMOC-OPS-FOP-6001-OPS-OAH

Fop Issue : 3.0 Issue Date: 13/04/10

Configuration of PM relay 0 and 1

File: H_CRP_DHS_3015.xls Author: S. Manganelli





Procedure Summary

Objectives

Force the position of PM relay 0 and 1 on either PM $\,$

Summary of Constraints

See info sheet

Spacecraft Configuration

Start of Procedure

Any

End of Procedure

One or both PM relays changed (on PM A or PM B)

Reference File(s)

Input Command Sequences

Output Command Sequences

HRD3015E HRD3015D HRD3015G HRD3015H HRD3015M HRD3015N HRD3015P HRD3015Q

Referenced Displays

ANDs GRDs SLDs

ZAD11999 ZAD07999

Configuration Control Information

DATE	FOP ISSUE	VERSION	MODIFICATION DESCRIPTION	AUTHOR	SPR REF
06/06/08		1	Created	cmevi-hp	
13/06/08	1	2	Added title and DB check	S. Manganelli	
02/12/08	2	3	Added text and info sheet	S. Manganelli	
18/03/10	3	4	Added comments and reformatted flowchart after "keep fit simulation 1"	S. Manganelli	

: Version 4 - Updated Status

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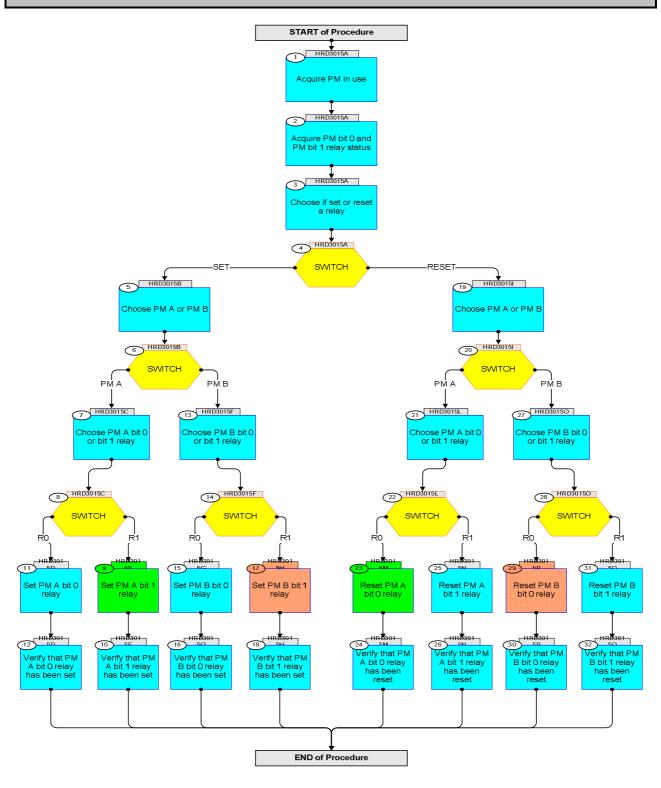
Configuration of PM relay 0 and 1

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Procedure Flowchart Overview



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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch AIT Comment		
		Beginning of Procedure				
	TC Seq. Name : HRD3015A (Dummy sequence) HRD3015A					
	UKD3015A					
		TimeTag Type: Sub Schedule ID:				
1		Acquire PM in use		Next Step:		
Τ.		Acquire FM III use				
		Week Complement				
		Verify Telemetry Active_PM_Board DEDM1160		AND=ZAD11999		
				Next Step:		
2		Acquire PM bit 0 and PM bit 1 relay status		3		
		Verify Telemetry PMA_R0_TTR-RM_A DEEX1160		AND=ZAD07999		
		Verify Telemetry PMA_R1_TTR-RM_A DEEX2160		AND=ZAD07999		
		Verify Telemetry PMB_R0_TTR-RM_B DEEX3160		AND=ZAD07999		
		Verify Telemetry PMB_R1_TTR-RM_B DEEX4160		AND=ZAD07999		
				Next Step:		
3		Choose if set or reset a relay		4		
		NOTE				
		The NOMINAL CONFIGURATION is achieved by :				
		RESETTING PM Relay 0				
		SETTING PM Relay 1 on both PMs				
		(green and orange steps on the flowchart). This				
		configuration :				
		Allows NOMINAL boot mode and				
		Selects SW IMAGE 1				
		on both sides.				
4		CMITCU		Next Step: SET 5		
*		SWITCH		RESET 19		
		type: [Switch]				
		End of Sequence				
	HPD2015P	TC Seq. Name : HRD3015B (Dummy sequence)				
	HRD3015B	Minates There				
		TimeTag Type: Sub Schedule ID:				
		agion 4 Indated				

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Step				
No.	Time	Activity/Remarks	TC/TLM	Display/ Branch AIT Comment Next Step:
5		Choose PM A or PM B		6
6		SWITCH		Next Step: PM A 7
0				PM B 13
		type: [Switch]		
		End of Sequence		
		TC Seq. Name : HRD3015C (Dummy sequence)		
	HRD3015C			
		TimeTag Type: Sub Schedule ID:		
		Sub Benedule 15.		
				Next Step:
7		Choose PM A bit 0 or bit 1 relay		8
8		SWITCH		Next Step: R1 9
0				R0 11
		type: [Switch]		
		End of Sequence		
		End of Sequence TC Seq. Name : HRD3015E (Set PM A bit 1 relay)		
	HRD3015E	TC Seq. Name : HRD3015E (Set PM A bit 1 relay)		
	HRD3015E			
	HRD3015E	TC Seq. Name :HRD3015E (Set PM A bit 1 relay) TimeTag Type:		
	HRD3015E	TC Seq. Name :HRD3015E (Set PM A bit 1 relay) TimeTag Type:		
	HRD3015E	TC Seq. Name :HRD3015E (Set PM A bit 1 relay) TimeTag Type:		Next Step:
9	HRD3015E	TC Seq. Name :HRD3015E (Set PM A bit 1 relay) TimeTag Type:		Next Step:
9	HRD3015E	TC Seq. Name :HRD3015E (Set PM A bit 1 relay) TimeTag Type: Sub Schedule ID:		
9	HRD3015E	TC Seq. Name :HRD3015E (Set PM A bit 1 relay) TimeTag Type: Sub Schedule ID:		
9	HRD3015E	TC Seq. Name :HRD3015E (Set PM A bit 1 relay) TimeTag Type: Sub Schedule ID: Set PM A bit 1 relay Execute Telecommand		
9	HRD3015E	TC Seq. Name :HRD3015E (Set PM A bit 1 relay) TimeTag Type: Sub Schedule ID: Set PM A bit 1 relay	DCA58170	10
9	HRD3015E	TC Seq. Name :HRD3015E (Set PM A bit 1 relay) TimeTag Type: Sub Schedule ID: Set PM A bit 1 relay Execute Telecommand PM_A bit_1_SW_Image_1 TC Control Flags :	DCA58170	10
9	HRD3015E	TC Seq. Name :HRD3015E (Set PM A bit 1 relay) TimeTag Type: Sub Schedule ID: Set PM A bit 1 relay Execute Telecommand PM_A bit_1_SW_Image_1 TC Control Flags : GBM IL DSEY YYY	DCA58170	10
9	HRD3015E	TC Seq. Name :HRD3015E (Set PM A bit 1 relay) TimeTag Type: Sub Schedule ID: Set PM A bit 1 relay Execute Telecommand PM_A_bit_1_SW_Image_1 TC Control Flags : GBM IL DSEY YYY Subsch. ID : 10 Det. descr. : Set PM A bit 1 = Select SW Image 1 -	DCA58170	10
9	HRD3015E	TC Seq. Name :HRD3015E (Set PM A bit 1 relay) TimeTag Type: Sub Schedule ID: Set PM A bit 1 relay Execute Telecommand PM_A_bit_1_SW_Image_1 TC Control Flags : GBM IL DSEY YYY Subsch. ID : 10	DCA58170	10
9	HRD3015E	TC Seq. Name :HRD3015E (Set PM A bit 1 relay) TimeTag Type: Sub Schedule ID: Set PM A bit 1 relay Execute Telecommand PM_A_bit_1_SW_Image_1 TC Control Flags : GBM IL DSEY YYY Subsch. ID : 10 Det. descr. : Set PM A bit 1 = Select SW Image 1 -	DCA58170	10
9	HRD3015E	TC Seq. Name :HRD3015E (Set PM A bit 1 relay) TimeTag Type: Sub Schedule ID: Set PM A bit 1 relay Execute Telecommand PM_A_bit_1_SW_Image_1 TC Control Flags : GBM IL DSEY YYY Subsch. ID : 10 Det. descr. : Set PM A bit 1 = Select SW Image 1 -	DCA58170	TC
9	HRD3015E	TC Seq. Name :HRD3015E (Set PM A bit 1 relay) TimeTag Type: Sub Schedule ID: Set PM A bit 1 relay Execute Telecommand PM_A_bit_1_SW_Image_1 TC Control Flags : GBM IL DSEY YYY Subsch. ID : 10 Det. descr. : Set PM A bit 1 = Select SW Image 1 -	DCA58170	10
	HRD3015E	TC Seq. Name :HRD3015E (Set PM A bit 1 relay) TimeTag Type: Sub Schedule ID: Set PM A bit 1 relay Execute Telecommand PM_A bit_1_SW_Image_1 TC Control Flags : GBM IL DSEY YYY Subsch. ID : 10 Det. descr. : Set PM A bit 1 = Select SW Image 1 - High Priority Standard	DCA58170	TC Next Step:
	HRD3015E	TC Seq. Name :HRD3015E (Set PM A bit 1 relay) TimeTag Type: Sub Schedule ID: Set PM A bit 1 relay Execute Telecommand PM_A bit_1_SW_Image_1 TC Control Flags : GBM IL DSEY YYY Subsch. ID : 10 Det. descr. : Set PM A bit 1 = Select SW Image 1 - High Priority Standard	DCA58170	TC Next Step:
	HRD3015E	TC Seq. Name :HRD3015E (Set PM A bit 1 relay) TimeTag Type: Sub Schedule ID: Set PM A bit 1 relay Execute Telecommand PM_A bit_1_SW_Image_1 TC Control Flags : GBM IL DSEY YYY Subsch. ID : 10 Det. descr. : Set PM A bit 1 = Select SW Image 1 - High Priority Standard	DCA58170	TC Next Step: END
	HRD3015E	TimeTag Type: Sub Schedule ID: Set PM A bit 1 relay Execute Telecommand PM_A bit_1_SW_Image_1 TC Control Flags: GBM IL DSEY YYY Subsch. ID: 10 Det. descr.: Set PM A bit 1 = Select SW Image 1 - High Priority Standard Verify that PM A bit 1 relay has been set	DCA58170	TC Next Step:
	HRD3015E	TimeTag Type: Sub Schedule ID: Set PM A bit 1 relay Execute Telecommand PM_A bit_1_SW_Image_1 TC Control Flags: GBM IL DSEY YYY Subsch. ID: 10 Det. descr.: Set PM A bit 1 = Select SW Image 1 - High Priority Standard Verify that PM A bit 1 relay has been set		TC Next Step: END

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File: H_CRP_DHS_3015.xls Author: S. Manganelli





Step					
No.	Time	Activity/Remarks TC Seq. Name :HRD3015D (Set PM A bit 0 relay)	TC/TLM	Display/ Branch	AIT Comment
	HRD3015D				
		TimeTag Type:			
		Sub Schedule ID:			
	1			Next Step:	
11		Set PM A bit 0 relay		12	
		Execute Telecommand		TC	
		Set_PM_A_bit_0	DCA56170		
		TC Control Flags : GBM IL DSE			
		Y YYY Subsch. ID : 10			
		Det. descr. : Set PM A bit 0 - High Priority Standard			
1.0		Their that DM 2 hit 0 and a har har and		Next Step:	
12		Verify that PM A bit 0 relay has been set		END	
		Verify Telemetry PMA_R0_TTR-RM_A DEEX1160	= SET	AND=ZAD07999	
		End of Sequence			
	HRD3015F	TC Seq. Name : HRD3015F (Dummy sequence)			
	1111200101	TimeTag Type:			
		Sub Schedule ID:			
13		Choose PM B bit 0 or bit 1 relay		Next Step:	
		-			
14		SWITCH		Next Step: R0 15	
1 1 1				R1 17	
		type: [Switch]			
		End of Sequence			
	HRD3015G	TC Seq. Name :HRD3015G (Set PMB bit 0 relay)			
	200100	TimeTag Type:			
		Sub Schedule ID:			
15		Set PM B bit 0 relay		Next Step:	
13		See In D Die o Telay		1.0	

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Step					
No.	Time	Activity/Remarks Execute Telecommand	TC/TLM	Display/ Branch	AIT Comment
		Set_PM_B_bit_0	DCA60170		
		TC Control Flags :			
		GBM IL DSE			
		Subsch. ID : 10 Det. descr. : Set PM B bit 0 - High Priority Standard			
				Next Step:	
16		Verify that PM B bit 0 relay has been set		END	
		Verify Telemetry			
		PMB_R0_TTR-RM_B DEEX3160	= SET	AND=ZAD07999	
		End of Sequence			
	HRD3015H	TC Seq. Name : HRD3015H (Set PMB bit 1 relay)			
		TimeTag Type:			
		Sub Schedule ID:			
				Next Step:	
17		Set PM B bit 1 relay		18	
		Execute Telecommand PM_B_bit_1_SW_Image_1	DCA62170	TC	
			DCA021/0		
		TC Control Flags : GBM IL DSE			
		Y YYY Subsch. ID : 10			
		Det. descr. : Set PM B bit 1 = Select SW Image 1 - High Priority Standard			
				North Chart	
18		Verify that PM B bit 1 relay has been set		Next Step: END	
		Verify Telemetry			
		PMB_R1_TTR-RM_B DEEX4160	= SET	AND=ZAD07999	
		End of Sequence			
		TC Seq. Name :HRD3015I (Dummy sequence)			
	HRD3015I				
		TimeTag Type: Sub Schedule ID:			
19		Change PM A or PM P		Next Step:	
13		Choose PM A or PM B		20	
				Next Step:	
20		SWITCH		PM A 21 PM B 27	
		type: [Switch]			

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch AIT Comment
		End of Sequence TC Seq. Name : HRD3015L (Dummy sequence)		
	HRD3015L	To beg. Name . INDUSTIBL (Dummy sequence)		
		TimeTag Type:		
		Sub Schedule ID:		
	1			Next Step:
21		Choose PM A bit 0 or bit 1 relay		22
22		SWITCH		Next Step: R0 23
		type: [Switch]		R1 25
		End of Sequence	·	
	HRD3015M	TC Seq. Name : HRD3015M (Reset PMA bit 0 rela)		
		TimeTag Type:		
		Sub Schedule ID:		
	1		T	Novt Cton:
23		Reset PM A bit 0 relay		Next Step: 24
		Execute Telecommand		TC
		Reset_PM_A_bit_0	DCA57170	
		TC Control Flags : GBM IL DSE		
		Subsch. ID : 10		
		Det. descr. : Reset PM A bit 0 - High Priority		
		Standard		
24		Varify that DM A hit C relay has been been		Next Step:
24		Verify that PM A bit 0 relay has been reset		END
		Vanifu malanakun		
		Verify Telemetry PMA_R0_TTR-RM_A DEEX1160	= RESET	AND=ZAD07999
		End of Sequence		
	HRD3015N	TC Seq. Name :HRD3015N (Reset PMA bit 1 rela)		
		TimeTag Type:		
		Sub Schedule ID:		
25		Reset PM A bit 1 relay		Next Step: 26
1				

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Step				
No.	Time	Activity/Remarks Execute Telecommand	TC/TLM	Display/ Branch AIT Comment
		PM_A_bit_1_SW_Image_2	DCA59170	
		TC Control Flags :		
		GBM IL DSE Y YYY		
		Subsch. ID : 10 Det. descr. : Reset PM A bit 1 = Select SW Image 2 -		
		High Priority Standard		
				Next Step:
26		Verify that PM A bit 1 relay has been reset		END
		Verify Telemetry PMA_R1_TTR-RM_A DEEX2160	= RESET	AND=ZAD07999
		End of Sequence		
	HRD3015O	TC Seq. Name :HRD30150 (Dummy sequence)		
		TimeTag Type:		
		Sub Schedule ID:		
				la constant de la con
27		Choose PM B bit 0 or bit 1 relay		Next Step: 28
28		SWITCH		Next Step: RO 29
		type: [Switch]		R1 31
		End of Sequence TC Seq. Name : HRD3015P (Reset PMB bit 0 rela)		
	HRD3015P	To beg. Name . INDSVISE (Reset Filb bit 0 Teta)		
		TimeTag Type:		
		Sub Schedule ID:		
				Next Step:
29		Reset PM B bit 0 relay		30
		Execute Telecommand Reset_PM_B_bit_0	DCA61170	TC
		TC Control Flags :		
		GBM IL DSE		
		Subsch. ID: 10		
		Det. descr. : Reset PM B bit 0 - High Priority Standard		
				Next Step:
30		Verify that PM B bit 0 relay has been reset		END END
		Verify Telemetry	- Decem	AND=ZAD07999
		PMB_R0_TTR-RM_B DEEX3160	= RESET	END=08D0 1993
	·	·	·	······································

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Step No.	Time	Activity/Remarks	TC/TLM	Display (Proper	AIT Comment
NO.	Time	ACTIVITY/Remarks	TC/TLM	Display/ Branch	All Comment
	<u> </u>	End of Sequence	I		
	HRD3015Q	TC Seq. Name : HRD3015Q (Reset PMB bit 1 rela)			
		TimeTag Type: Sub Schedule ID:			
				Next Step:	
31		Reset PM B bit 1 relay		32	
		Execute Telecommand PM_B_bit_1_SW_Image_2	DCA63170	TC	
		TC Control Flags : GBM IL DSE Y YYY Subsch. ID : 10 Det. descr. : Reset PM B bit 1 = Select SW Image 2 - High Priority Standard			
32		Verify that PM B bit 1 relay has been reset		Next Step: END	
		Verify Telemetry PMB_R1_TTR-RM_B DEEX4160	= RESET	AND=ZAD07999	
		End of Sequence			
		End of Procedure			

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Info

PM Bits 0 and 1 can be commanded at any time, they are used by the OBSW only during the next boot.

PM bit 0 = SET = "Survival" will trigger the switch to Survival mode.

Basically this relay can assume two values (RESET = Nominal and SET = Survival) and it is used by both BSW and ASW to retrieve data from SGM (PM Bit 0 = RESET) or EEPROM (PM Bit 0 = SET).

Default configuration for PM Relay 0 is RESET for both PM-A and PM-B. It is autonomously modified to SET by the RM following an S/C Level 4 FDIR, leading to an S/C Survival Mode transition.

On board autonomous commanding never resets PM bit 0 and it should be RESET to "Nominal" by the Ground when recovering from Survival mode, otherwise a subsequent level 3 failure would lead to another switch to Survival mode.

PM bit 1 = RESET = "Select SW Image 2" will cause the second image in EEPROM to be loaded in RAM as part of the bootstrap logic. The EEPROM stores two SW images, one in each half of the EEPROM. SW Image 1 (in the lower half of the EEPROM) is used when PM Relay 1 is set and SW Image 2 (in the upper part of the EEPROM) is used when PM Relay 1 is reset (cleared).

On board autonomous commanding never sets it back to "Select SW Image 1" and thus it is up to the Ground to set the PM bit 1 when correcting the SW images stored on board.

The PM bits relay values (part of the Configuration relays variable) reflect the value at initialisation and are not updated in response to subsequent Ground TC, even though the actual value is affected by commanding and the value will be taken into account at the next reboot.

The commanded position of the relay can be observed by Ground via the data pool variables in charge of storing the status of the relay, as read from the TTR boards.

So:

DEEX1160 PMA_R0_TTR-RM_A - PM A Relay 0 as read from TTR/RM board A DEEX3160 PMB_R0_TTR-RM_B - PM B Relay 0 as read from TTR/RM board B

are the current values, while

DEK8K160 PM_relay_0

is the status used by OBSW at last boot.

PM relay 1 current value parameters :

DEEX2160 PMA_R1_TTR-RM_A - PM A Relay 1 as read from TTR/RM board A DEEX4160 PMB_R1_TTR-RM_B - PM B Relay 1 as read from TTR/RM board B

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