

MCU_BOOT Mode Transisiton
 File: H_COP_SPI_MMCB.xls
 Author: R. Biggins



Procedure Summary

Objectives

This is a mode transisition procedure. The purpose of this procedure is to boot the MCU.
 This procedure has been updated for the Power Recycle.

Based on procedure:
 Name:MCU_BOOT
 Version number:2
 Generated:10/10/2009

Summary of Constraints

n/a

Spacecraft Configuration

Start of Procedure

Sub-Mode = SCU_ON

End of Procedure

Mode = REDY

Reference File(s)

Input Command Sequences

Output Command Sequences

HCSMMCB

Referenced Displays

ANDs **GRDs** **SLDs**
 ZAZ90999
 ZAZ91999
 SA_7_559

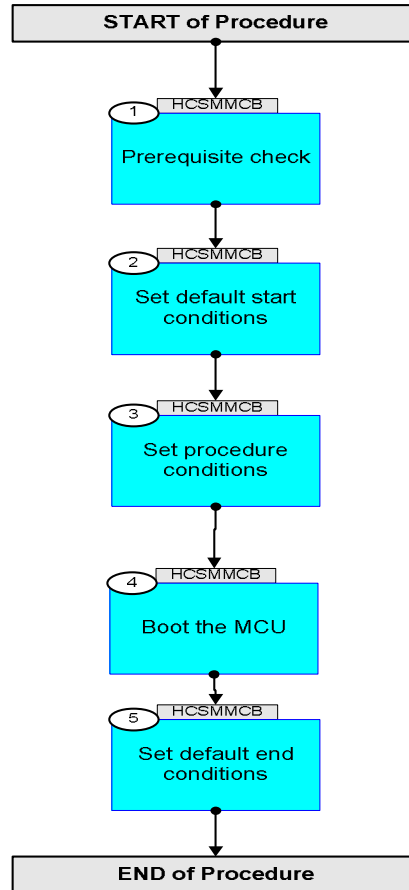
Configuration Control Information

DATE	FOP ISSUE	VERSION	MODIFICATION DESCRIPTION	AUTHOR	SPR REF
19/04/2009		1	Created	L.Lucas-hp	
21/04/2009	2.3	1.01	Validation : TExt Update	L.Lucas-hp	
13/10/2009	3	2	Updates fro Power Recycle, remove the possibility for SPIRE to be switched to SAFE	L.Lucas-hp	
14/12/2010	3.1	3	Update due to new inputs from SPIRE	R. Biggins	

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Procedure Flowchart Overview



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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
Beginning of Procedure				
<p><i>TC Seq. Name : HCSMMCB (Mode Trans Boot MCU)</i></p> <p><i>TimeTag Type: N</i> <i>Sub Schedule ID:</i></p> <p style="text-align: center;">□</p>				
1		<i>Prerequisite check</i>		Next Step: 2
1.1		<i>HSC/ICC input</i>		□
		Verify that the HSC has supplied a valid OBSID value: OBS_ID = 0xnnnn nnnn		
2		<i>Set default start conditions</i>		Next Step: 3
		Note that a TM(5,1) packet [New_Step_Report] is generated after each of the following SET_OBS_STEP telecommands		
	ET=+ UT=+00.00.00	SET_OBS_STEP SET_OBS_STEP <i>Command Parameter(s) :</i> OBSERVATION_STEP SP03N500 <i>TC Control Flags :</i> GBM IL DSE --Y -- -- <i>Subsch. ID : 370</i> <i>Det. descr. : SET OBSERVATION STEP</i>	SC003500 0 <hex>	
	ET=+ UT=+00.00.01	SET_BBID SET_BBID <i>Command Parameter(s) :</i> BUILDING_BLOCK_ID SP01N500 <i>Subsch. ID : 370</i> <i>Det. descr. : SET BUILDING BLOCK IDENTIFIER</i>	SC001500 80010001 <hex>	
		Verify Telemetry BBFULLTYPE SM2LN500 = ClearObs		AND=ZAZ90999

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
	ET=+ UT=+00.00.00	SET_OBS_STEP SET_OBS_STEP Command Parameter(s) : OBSERVATION_STEP SP03N500 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 370 Det. descr. : SET OBSERVATION STEP	SC003500 1 <hex>	
	ET=+ UT=+00.00.01	SET_OBSID SET_OBSID Command Parameter(s) : OBSERVATION_ID SP00N500 Subsch. ID : 370 Det. descr. : SET OBSERVATION IDENTIFIER	SC000500 00000000 <hex>	
		Verify Telemetry OBSID SM10N500	= 00000000 <hex>	AND=ZAZ90999
	ET=+ UT=+00.00.00	SET_OBS_STEP SET_OBS_STEP Command Parameter(s) : OBSERVATION_STEP SP03N500 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 370 Det. descr. : SET OBSERVATION STEP	SC003500 0 <hex>	
	ET=+ UT=+00.00.01	SET_BBID SET_BBID Command Parameter(s) : BUILDING_BLOCK_ID SP01N500 Subsch. ID : 370 Det. descr. : SET BUILDING BLOCK IDENTIFIER	SC001500 80000000 <hex>	
		Verify Telemetry BBFULLTYPE SM2LN500	= Null	AND=ZAZ90999
	ET=+ UT=+00.00.00	SET_OBS_STEP SET_OBS_STEP Command Parameter(s) : OBSERVATION_STEP SP03N500 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 370 Det. descr. : SET OBSERVATION STEP	SC003500 0 <hex>	

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
	ET=+ UT=+00.00.01	SET_BBID Command Parameter(s) : BUILDING_BLOCK_ID Subsch. ID : 370 Det. descr. : SET BUILDING BLOCK IDENTIFIER	SET_BBID SP01N500 80020001 <hex>	SC001500
		Verify Telemetry BBFULLTYPE	SM2LN500	= StartObsAll AND=ZAZ90999
3		Set procedure conditions		Next Step: 4
	ET=+ UT=+00.00.00	RESET_DRCU_COUNTERS TC Control Flags : Subsch. ID : 370 Det. descr. : RESET DRCU COUNTERS	RESET_DRCU_COUNTERS GBM IL DSE --Y -- ---	SCD00505
		Verify that the TRESET parameter has the same value as the THSK parameter	TRESET	SM01T500 same as THSK AND=ZAZ90999
			THSK	SM00T500 any AND=ZAZ90999
		Note that a TM(5,1) packet [New_Step_Report] is generated after each of the following SET_OBS_STEP telecommands		
	ET=+ UT=+00.00.00	SET_OBS_STEP Command Parameter(s) : OBSERVATION_STEP TC Control Flags : Subsch. ID : 370 Det. descr. : SET OBSERVATION STEP	SET_OBS_STEP SP03N500 1 <hex>	SC003500
	ET=+ UT=+00.00.01	SET_OBSID Command Parameter(s) : OBSERVATION_ID Subsch. ID : 370 Det. descr. : SET OBSERVATION IDENTIFIER	SET_OBSID SP00N500 OBSID	SC000500
		Verify Telemetry OBSID	SM10N500	OBS_ID AND=ZAZ90999

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
	ET=+ UT=+00.00.00	SET_OBS_STEP Command Parameter(s) : OBSERVATION_STEP TC Control Flags : Subsch. ID : 370 Det. descr. : SET OBSERVATION STEP	SET_OBS_STEP SP03N500 GBM IL DSE --Y -- --- SC003500 0 <hex>	
	ET=+ UT=+00.00.01	SET_BBID Command Parameter(s) : BUILDING_BLOCK_ID Subsch. ID : 370 Det. descr. : SET BUILDING BLOCK IDENTIFIER	SET_BBID SP01N500 80000000 <hex>	
		Verify Telemetry BBFULLTYPE SM2LN500	= Null	AND=ZAZ90999
	ET=+ UT=+00.00.00	SET_OBS_STEP Command Parameter(s) : OBSERVATION_STEP TC Control Flags : Subsch. ID : 370 Det. descr. : SET OBSERVATION STEP	SET_OBS_STEP SP03N500 GBM IL DSE --Y -- --- SC003500 0 <hex>	
	ET=+ UT=+00.00.01	SET_BBID Command Parameter(s) : BUILDING_BLOCK_ID Subsch. ID : 370 Det. descr. : SET BUILDING BLOCK IDENTIFIER	SET_BBID SP01N500 89000001 <hex>	
		Verify Telemetry BBFULLTYPE SM2LN500	= MCU_Boot	AND=ZAZ90999
	ET=+ UT=+00.00.02	SET_OBS_MODE Command Parameter(s) : OBSERVING_MODE TC Control Flags : Subsch. ID : 370 Det. descr. : SET OBSERVING MODE	SET_OBS_MODE SP02N500 GBM IL DSE --Y -- --- SC002500 102 <hex>	

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
	ET=+ UT=+00.00.05	SEND_DRCU_COMMAND SEND_DRCU_COMMAND Command Parameter(s) : DRCUCOMMAND SPD4N505 OVERRIDE SPD9N505 Subsch. ID : 370 Det. descr. : SEND A SINGLE COMMAND TO THE DRCU	SCD06505 90010007 <hex> 0 <hex> (Def)	
	ET=+ UT=+00.00.05	SEND_DRCU_COMMAND SEND_DRCU_COMMAND Command Parameter(s) : DRCUCOMMAND SPD4N505 OVERRIDE SPD9N505 Subsch. ID : 370 Det. descr. : SEND A SINGLE COMMAND TO THE DRCU	SCD06505 9021c000 <hex> 0 <hex> (Def)	
	ET=+ UT=+00.00.05	SEND_DRCU_COMMAND SEND_DRCU_COMMAND Command Parameter(s) : DRCUCOMMAND SPD4N505 OVERRIDE SPD9N505 Subsch. ID : 370 Det. descr. : SEND A SINGLE COMMAND TO THE DRCU	SCD06505 90240001 <hex> 0 <hex> (Def)	
	ET=+ UT=+00.00.05	SEND_DRCU_COMMAND SEND_DRCU_COMMAND Command Parameter(s) : DRCUCOMMAND SPD4N505 OVERRIDE SPD9N505 Subsch. ID : 370 Det. descr. : SEND A SINGLE COMMAND TO THE DRCU	SCD06505 904A0000 <hex> 0 <hex> (Def)	
	ET=+ UT=+00.00.05	SEND_DRCU_COMMAND SEND_DRCU_COMMAND Command Parameter(s) : DRCUCOMMAND SPD4N505 OVERRIDE SPD9N505 Subsch. ID : 370 Det. descr. : SEND A SINGLE COMMAND TO THE DRCU	SCD06505 904d0000 <hex> 0 <hex> (Def)	
	ET=+ UT=+00.00.05	SEND_DRCU_COMMAND SEND_DRCU_COMMAND Command Parameter(s) : DRCUCOMMAND SPD4N505 OVERRIDE SPD9N505 Subsch. ID : 370 Det. descr. : SEND A SINGLE COMMAND TO THE DRCU	SCD06505 90557df1 <hex> 0 <hex> (Def)	

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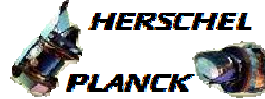
Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
	ET=+ UT=+00.00.05	SEND_DRCU_COMMAND SEND_DRCU_COMMAND Command Parameter(s) : DRCUCOMMAND SPD4N505 OVERRIDE SPD9N505 Subsch. ID : 370 Det. descr. : SEND A SINGLE COMMAND TO THE DRCU	SCD06505 90542ea5 <hex> 0 <hex> (Def)	
	ET=+ UT=+00.00.05	SEND_DRCU_COMMAND SEND_DRCU_COMMAND Command Parameter(s) : DRCUCOMMAND SPD4N505 OVERRIDE SPD9N505 Subsch. ID : 370 Det. descr. : SEND A SINGLE COMMAND TO THE DRCU	SCD06505 91c70061 <hex> 0 <hex> (Def)	
	ET=+ UT=+00.00.01	SEND_DRCU_COMMAND SEND_DRCU_COMMAND Command Parameter(s) : DRCUCOMMAND SPD4N505 OVERRIDE SPD9N505 Subsch. ID : 370 Det. descr. : SEND A SINGLE COMMAND TO THE DRCU	SCD06505 91c8006b <hex> 0 <hex> (Def)	
	ET=+ UT=+00.00.01	SEND_DRCU_COMMAND SEND_DRCU_COMMAND Command Parameter(s) : DRCUCOMMAND SPD4N505 OVERRIDE SPD9N505 Subsch. ID : 370 Det. descr. : SEND A SINGLE COMMAND TO THE DRCU	SCD06505 91c90065 <hex> 0 <hex> (Def)	
	ET=+ UT=+00.00.01	SEND_DRCU_COMMAND SEND_DRCU_COMMAND Command Parameter(s) : DRCUCOMMAND SPD4N505 OVERRIDE SPD9N505 Subsch. ID : 370 Det. descr. : SEND A SINGLE COMMAND TO THE DRCU	SCD06505 91ca0070 <hex> 0 <hex> (Def)	
	ET=+ UT=+00.00.01	SEND_DRCU_COMMAND SEND_DRCU_COMMAND Command Parameter(s) : DRCUCOMMAND SPD4N505 OVERRIDE SPD9N505 Subsch. ID : 370 Det. descr. : SEND A SINGLE COMMAND TO THE DRCU	SCD06505 91c6006f <hex> 0 <hex> (Def)	

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
	ET=+ UT=+00.00.01	SEND_DRCU_COMMAND SEND_DRCU_COMMAND Command Parameter(s) : DRCUCOMMAND SPD4N505 OVERRIDE SPD9N505 Subsch. ID : 370 Det. descr. : SEND A SINGLE COMMAND TO THE DRCU	SCD06505 91d4006b <hex> 0 <hex> (Def)	
	ET=+ UT=+00.00.01	REPORT_TABLE REPORT_TABLE Command Parameter(s) : TABLEID_REPTAB SPB2N500 INDEX_REPTAB SPB3N500 COUNT_REPTAB SPB4N500 Subsch. ID : 370 Det. descr. : REQUEST TM PACKETS REPORTING CONTENTS OF A TABLE	SCB01500 6 <hex> 0 <hex> 0 <hex>	
	ET=+ UT=+00.00.02	UPDATE_TABLE UPDATE_TABLE Command Parameter(s) : TABLEID_UPDTAB SPB5N500 INDEX_UPDTAB SPB6N500 N_UPDTAB SPB7N500 DATA_UPDTAB SPB8N500 DATA_UPDTAB SPB8N500 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 370 Det. descr. : UPDATE CONTENTS OF A TABLE	SCB02500 6 <hex> 10 <hex> 2 <hex> 3 <hex> 3 <hex>	
	ET=+ UT=+00.00.02	REPORT_TABLE REPORT_TABLE Command Parameter(s) : TABLEID_REPTAB SPB2N500 INDEX_REPTAB SPB3N500 COUNT_REPTAB SPB4N500 Subsch. ID : 370 Det. descr. : REQUEST TM PACKETS REPORTING CONTENTS OF A TABLE	SCB01500 6 <hex> 0 <hex> 0 <hex>	
	ET=+ UT=+00.00.02	SET_OBS_MODE SET_OBS_MODE Command Parameter(s) : OBSERVING_MODE SP02N500 Subsch. ID : 370 Det. descr. : SET OBSERVING MODE	SC002500 200 <hex>	

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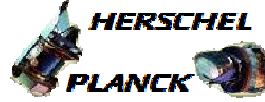
Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
	ET=+ UT=+00.00.01	SET_OBS_STEP SET_OBS_STEP Command Parameter(s) : OBSERVATION_STEP SP03N500 Subsch. ID : 370 Det. descr. : SET OBSERVATION STEP	SC003500 0 <hex>	
	ET=+ UT=+00.00.00	SET_BBID SET_BBID Command Parameter(s) : BUILDING_BLOCK_ID SP01N500 Subsch. ID : 370 Det. descr. : SET BUILDING BLOCK IDENTIFIER	SC001500 80000000 <hex>	
	ET=+ UT=+00.00.02	DEFINE_NEW_HK_REPORT DEFINE_NEW_HK_REPORT Command Parameter(s) : HKPCKTID_DEFINENEWHK SPR0N500 301 <hex> HKSID_DEFINENEWHK SPR1N500 301 <hex> HKINTERVAL_DEFINENEWHK SPR2N500 fa0 <hex> HKREPEAT_DEFINENEWHK SPR3N500 1 <hex> TABLEID_DEFINENEWHK SPR4N500 1 <hex> Subsch. ID : 370 Det. descr. : DEFINE NEW HOUSEKEEPING PARAMETER REPORT	SCR00500 301 <hex> 301 <hex> fa0 <hex> 1 <hex> 1 <hex>	
		Verify Telemetry is incrementing at 4 second interval TM2N SMT1N500		AND=SA_7_559
		Verify Telemetry is updating every four seconds THSK SM00T500		AND=SA_7_559
		Verify Telemetry MODE SM00M500 = REDY		AND=ZAZ91999
4.1		TM Checks		<input type="checkbox"/>
		Now check MCU Board voltages		
		Verify Telemetry value is ~5V MCUP5V SM_4V515		AND=SA_7_559
		Verify Telemetry is ~15.5V MCUP15V SM_0V515		AND=SA_7_559
		Verify Telemetry is ~14.1V MCUP14V SM_2V515		AND=SA_7_559
		Verify Telemetry value is ~14.5V MCUM14V SM_3V515		AND=SA_7_559
		Verify Telemetry value is ~15.6V MCUM15V SM_1V515		AND=SA_7_559

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
5		Set default end conditions		Next Step: END
		Note that a TM(5,1) packet [New_Step_Report] is generated after each of the following SET_OBS_STEP telecommands		
	ET=+ UT=+00.00.00	SET_OBS_STEP Command Parameter(s) : OBSERVATION_STEP SP03N500 TC Control Flags : Subsch. ID : 370 Det. descr. : SET OBSERVATION STEP	SET_OBS_STEP SC003500 0 <hex>	
	ET=+ UT=+00.00.01	SET_BBID Command Parameter(s) : BUILDING_BLOCK_ID SP01N500 Subsch. ID : 370 Det. descr. : SET BUILDING BLOCK IDENTIFIER	SET_BBID SC001500 80000000 <hex>	
		Verify Telemetry BBFULLTYPE SM2LN500	= Null	AND=ZAZ90999
	ET=+ UT=+00.00.00	SET_OBS_STEP Command Parameter(s) : OBSERVATION_STEP SP03N500 TC Control Flags : Subsch. ID : 370 Det. descr. : SET OBSERVATION STEP	SET_OBS_STEP SC003500 0 <hex>	
	ET=+ UT=+00.00.01	SET_BBID Command Parameter(s) : BUILDING_BLOCK_ID SP01N500 Subsch. ID : 370 Det. descr. : SET BUILDING BLOCK IDENTIFIER	SET_BBID SC001500 80030001 <hex>	
		Verify Telemetry BBFULLTYPE SM2LN500	= EndObs	AND=ZAZ90999

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	ET=+ UT=+00.00.00	SET_OBS_STEP SET_OBS_STEP Command Parameter(s) : OBSERVATION_STEP SP03N500 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 370 Det. descr. : SET OBSERVATION STEP	SC003500 1 <hex>	
	ET=+ UT=+00.00.01	SET_OBSID SET_OBSID Command Parameter(s) : OBSERVATION_ID SP00N500 Subsch. ID : 370 Det. descr. : SET OBSERVATION IDENTIFIER	SC000500 00000000 <hex>	
		Verify Telemetry OBSID SM10N500	= 00000000 <hex>	AND=ZAZ90999
	ET=+ UT=+00.00.00	SET_OBS_STEP SET_OBS_STEP Command Parameter(s) : OBSERVATION_STEP SP03N500 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 370 Det. descr. : SET OBSERVATION STEP	SC003500 0 <hex>	
	ET=+ UT=+00.00.01	SET_BBID SET_BBID Command Parameter(s) : BUILDING_BLOCK_ID SP01N500 Subsch. ID : 370 Det. descr. : SET BUILDING BLOCK IDENTIFIER	SC001500 80000000 <hex>	
		Verify Telemetry BBFULLTYPE SM2LN500	= Null	AND=ZAZ90999

End of Procedure