

HIFI Recovery - SPACON
File: H_CRP_HIF_SPCN.xls
Author: R. Biggins



Procedure Summary

Objectives

The objective of this procedure is to dump the LCU memory in the case when the HIFI autonomous checks have detected a problem and have generated a TM(5,4) packet.

NOTE that this procedure DOES NOT RECOVER THE FAILURE, but merely assembles the data required for later analysis and recovery.

This procedure should be run by the SPACON only

Summary of Constraints

Triggered by:
TM(5,4) from HIFI [APID 1025]

This procedure should be executed when other DTCP activities have been completed

This procedure is for the case when:

- HIFI is not in use
- There are two or more working days before HIFI will be in use
- There is one working day followed by a weekend before HIFI will be in use

If HIFI is in use, or HIFI must be recovered quickly before commanding begins, the on-call engineer should be called, and the procedure H_CRP_HIF_CALL should be executed instead

Spacecraft Configuration

Start of Procedure

Any CDMU bus profile may be use
HIFI in Standby mode

End of Procedure

HIFI in Standby mode

Reference File(s)

Input Command Sequences

Output Command Sequences

HRHSPCN
HRHSPCN2
HRHSPCN1

Referenced Displays

ANDs GRDs SLDs
ZAZEB999

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Configuration Control Information

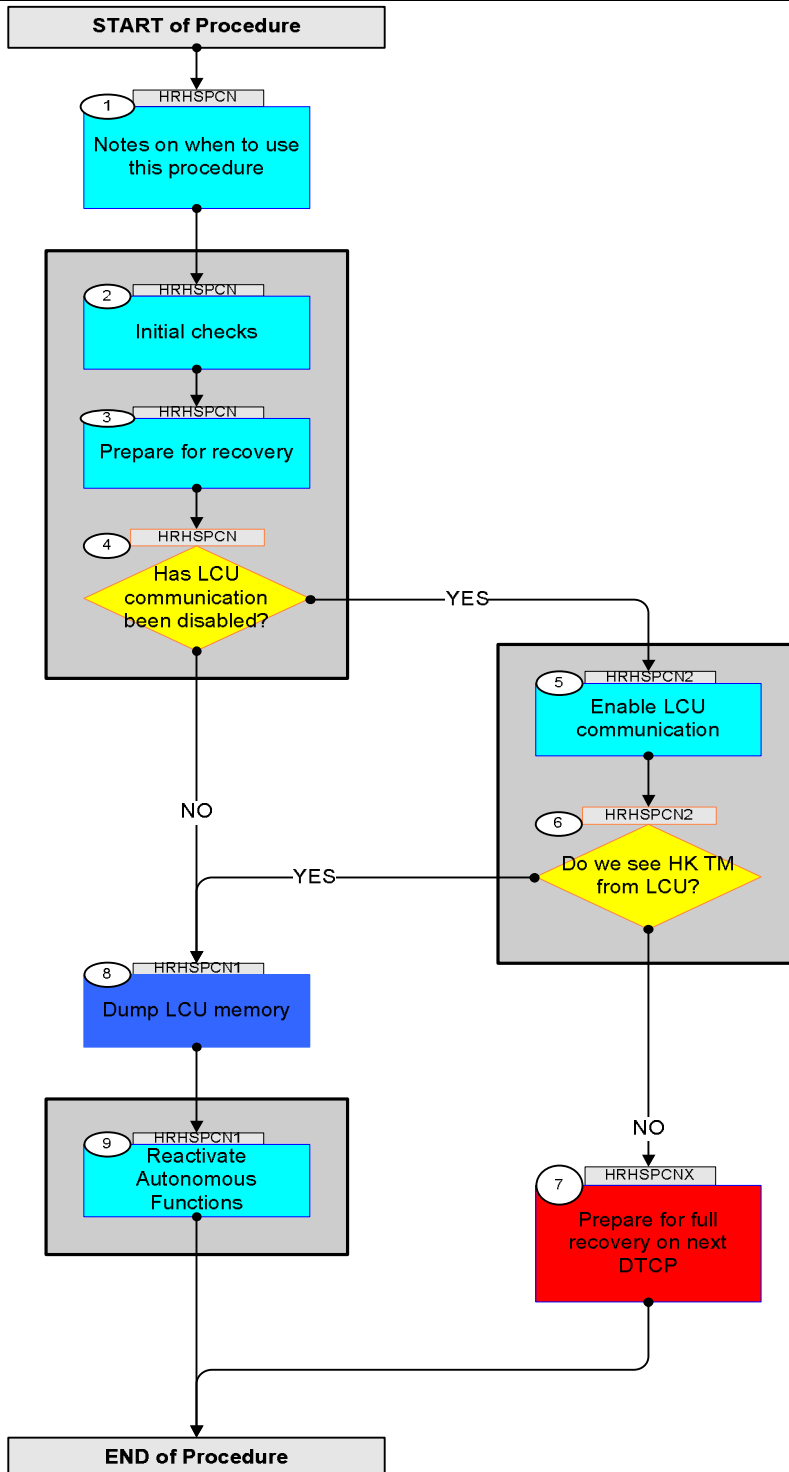
DATE	FOP ISSUE	VERSION	MODIFICATION DESCRIPTION	AUTHOR	SPR REF
26/02/2010		1	Created	R. Biggins	
08/04/2010	3	2	Updated due to initial testing	R. Biggins	
07/05/2010		3	Complete rewrite due to new HIFI software	R. Biggins	
07/05/2010		4	Dummy sequence HRHCALLX renamed HRHSPCNX (contains no TC or TM)	R. Biggins	
11/05/2010		4.01	Validation : Step 11 updated to include 'Load Sequence' comment	R. Biggins	
08/06/2010		5	Update due to comments by D. Teyssier and C. Risacher	R. Biggins	
29/06/2010		6	Update to correct ET/UT problems	R. Biggins	
10/02/2011		7	Update due to results of operational use	R. Biggins	
09/03/2011	3.1	8	Updated to remove the LCU reset TC and to identify additional failure cases	R. Biggins	

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Procedure Flowchart Overview

SPACON activities



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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
Beginning of Procedure				
<p><i>TC Seq. Name :HRHSPCN (Recovery - Block 1.1)</i></p> <p><i>TimeTag Type: N</i> <i>Sub Schedule ID:</i></p> <p style="text-align: center;">□</p>				
1		Notes on when to use this procedure		Next Step: 2
		<p>This procedure is for the case when:</p> <ul style="list-style-type: none"> - HIFI is not in use - There are two or more working days before HIFI will be in use - There is one working day followed by a weekend before HIFI will be in use <p>If HIFI is in use, or HIFI must be recovered quickly before commanding begins, the on-call engineer should be called, and the procedure H_CRP_HIF_CALL should be executed instead</p>		
		<p>NOTE that this procedure DOES NOT RECOVER THE FAILURE, but merely assembles the data required for later analysis and recovery.</p> <p>This procedure should be run by the SPACON only</p>		
2		Initial checks		Next Step: 3
		Note: LCU current (+/- 0.1A) <div style="display: flex; justify-content: space-between;"> HifiLCU_R_L54_I WM409565 </div>	see below	AND=ZAZEB999
		Note: LCU commanding <div style="display: flex; justify-content: space-between;"> HI_LCU_commands HM049190 </div>		AND=ZAZEB999
		Note: HIFI mode <div style="display: flex; justify-content: space-between;"> HL_MODE_S HM258194 </div>		AND=ZAZEB999
		<p>NOTE:</p> <ul style="list-style-type: none"> - Find the TM(5,4) [APID 1025] which identifies which autonomous action has stopped communication. 		
		<p>E-MAIL - HIFI communication: Mail the HIFI on-call representative and inform him that a TM(5,4) packet has been recieved, and provide the above details (including the time of the packet). If possible send a copy of the TM(5,4).</p>		
		<p>E-MAIL: Mail the H_FCT and inform them that a TM(5,4) packet has been received from HIFI. If possible send a copy of the TM(5,4).</p>		
3		Prepare for recovery		Next Step: 4

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		LOAD SEQUENCE: HRHSPCN		
3.1		Disable MTL		<input type="checkbox"/>
	ET=+ UT=+00.00.00	Execute Telecommand DisableRelOfTcs_Templ Command Parameter(s) : N_Repetition DH041170 SubscheduleId DH053170 M_nrOfApids DH054170 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 10 Det. descr. : TEMPLATE DisableReleaseOfTcs, TC(11,2)	DCT23170	
	ET=+ UT=+00.00.05	Execute Telecommand RetStatusOfCmdSchedule Subsch. ID : 10 Det. descr. : TEMPLATE ReportStatusOfCmdSchedule, TC(11,18), no appl. data	DCT25170	
		Verify: Using the OBQD, verify that subschedule 70 is disabled		
3.2		Disable autonomous checks		<input type="checkbox"/>
		Verify Telemetry HI_au_LCU_mem_S HM123190	= ON	AND=ZAZEB999
		Verify Telemetry HI_au_LCUmode_S HM124190	= ON	AND=ZAZEB999
		Verify Telemetry HI_au_LCUresp_S HM125190	= ON	AND=ZAZEB999
	ET=+ UT=+00.00.00	HIFI_Set_OBS_ID HIFI_Set_OBS_ID Command Parameter(s) : HIFI_BB_ID HP001197 HIFI_OBS_ID HP000197 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 70 Det. descr. : Set Observation-ID and Building-Block-ID	HC014289	

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
	ET=+ UT=+00.00.02	HIFI_LCU_mem_check_off HIFI_LCU_mem_check_off Subsch. ID : 70 Det. descr. : Disables autonomous function to check LCU-checksum	HC206289	
	ET=+ UT=+00.00.02	HIFI_LCUmode_check_off HIFI_LCUmode_check_off Subsch. ID : 70 Det. descr. : Disables autonomous function to check LCU-standby0 mode	HC204289	
	ET=+ UT=+00.00.02	HIFI_LCUnonresp_chck_off HIFI_LCUnonresp_chck_off Subsch. ID : 70 Det. descr. : Disables autonomous function to check LCU-HouseKeeping responses	HC202289	
		Verify Telemetry HI_au_LCU_mem_S HM123190 = OFF AND=ZAZEB999		
		Verify Telemetry HI_au_LCUmode_S HM124190 = OFF AND=ZAZEB999		
		Verify Telemetry HI_au_LCUresp_S HM125190 = OFF AND=ZAZEB999		
4		Has LCU communication been disabled?		Next Step: YES 5 NO 8
		Verify: LCU commanding HI_LCU_commands HM049190 = DISABLED AND=ZAZEB999		
		WARNING: - [ENABLED = NO] If TM is received from the LCU, the LCU can be dumped - [DISABLED = YES] If no TM is received from the LCU, then LCU communications should be restarted		
TC Seq. Name :HRHSPCN2 (Recovery - Block 1.3)				
TimeTag Type: N Sub Schedule ID: <input type="checkbox"/>				
5		Enable LCU communication		Next Step: 6
		LOAD SEQUENCE: HRHSPCN2		

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
	ET=+ UT=+00.00.00	Execute Telecommand HIFI_clear_LCU_comm_lock TC Control Flags : Subsch. ID : 70 Det. descr. : Resets the LCU communication lock status GBM IL DSE --Y -- --	HC200289	
		Verify: LCU commanding HI_LCU_commands HM049190	= ENABLED	AND=ZAZEB999
		Verify: PTV checksum OOL HL_ptv_checksum HD247194	OOL	AND=ZAZEB999
		WARNING: If there are multiple HIFI OOLs, or the LCU telemetry is still invalid, then this procedure should be stopped. The On-call SOE and HIFI should be informed immediately.		
		WARNING: - If TM has restarted from the LCU, the LCU memory can be dumped - If no TM is received from the LCU, then the LCU should be reset (part of the H_CRP_HIF_XPRT procedure to be executed by the HIFI SOE)		
6		Do we see HK TM from LCU?		Next Step: NO 7 YES 8
		Verify: HIFI mode HL_MODE_S HM258194	<valid>	AND=ZAZEB999
TC Seq. Name :HRHSPCNX (Recovery)				
TimeTag Type: Sub Schedule ID: <input type="checkbox"/>				
7		Prepare for full recovery on next DTCP		Next Step: END
		E-mail the H_FCT and the HIFI representative that HIFI needs to be power recycled (to be done by HIFI expert only)		
TC Seq. Name :HRHSPCN1 (Recovery - Block 1.2)				
TimeTag Type: N Sub Schedule ID: <input type="checkbox"/>				

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
8		Dump LCU memory		Next Step: 9
		Memory dump: Execute the commands defined in the stack described in the following procedure PROCEDURE: H_CRP_OBS_LCUD		
9		Reactivate Autonomous Functions		Next Step: END
		LOAD SEQUENCE: HRHSPCN1		
		Formal Parameter value: The value for the FP should be taken from ZAZEB999: HD246194 HL_exp_checksum		
		Verify: HC205289 has the correct value for the HIF_check_CRC Verify: verify parameter radix is correct		
	ET=+ UT=+00.00.00	Execute Telecommand HIFI_Housekeeping_on Command Parameter(s) : HIF_HK_rate HP012197 1_pkt_per_10_s HIF_FCU_S HP006197 ON (Def) HIF_LCU_S HP007197 ON (Def) HIF_WBSV_S HP009197 ON (Def) HIF_WBSH_S HP008197 ON (Def) HIF_HRSV_S HP011197 ON (Def) HIF_HRSH_S HP010197 ON (Def) TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 70 Det. descr. : Sets periodic housekeeping packet generation period	HC016289	
	ET=+ UT=+00.00.02	Execute Telecommand HIFI_LCU_mem_check_on Command Parameter(s) : HIFI_BB_ID HP001197 0F130001 <hex> HIF_step_time_ms HP079197 3000 ms HIF_check_crc HP233197 LCU_CRC HIF_step_time_s HP462197 3600 s (Def) Subsch. ID : 70 Det. descr. : Enables autonomous function to check LCU checksum	HC205289	

Expected state of HIFI based on TM(5,4) packet

<p>TM(5,4) HIFI_LCU_nonresponse</p> <p>The LCU is not responding; there has been a communications problem between the ICU and LCU</p> <p><i>Expected state:</i></p> <ul style="list-style-type: none">- HIFI set to Standby1 mode (not visible)- LCU commanding disabled
<p>TM(5,4) HIFI_R_LCU_in_standby0</p> <p>HIFI has been found in an unexpected mode</p> <p><i>Expected state:</i></p> <ul style="list-style-type: none">- HIFI set to Standby0 mode (not visible)- LCU commanding disabled
<p>TM(5,4) HIFI_R_LCUCRC_mismatch</p> <p>An SEU has been detected in an unknown area of the memory.</p> <p><i>Expected state:</i></p> <ul style="list-style-type: none">- HIFI set to Standby1 mode (not visible)- LCU commanding disabled
<p>TM(5,4) HIFI_LCUCRC_mismatch_table</p> <p>An SEU has been detected in the tables area of the memory.</p> <p><i>Expected state:</i></p> <ul style="list-style-type: none">- HIFI set to Standby1 mode
<p>TM(5,4) HIFI_LCUCRC_mismatch_safe</p> <p>An SEU has been detected in a safe area of the memory</p> <p><i>Expected state:</i></p> <ul style="list-style-type: none">- HIFI set to Standby1 mode (may or may not be visible)- LCU commanding may or may not be disabled
<p>TM(5,4) HIFI_LCUCRC_mismatch_critical</p> <p>An SEU has been detected in a critical area of the memory.</p> <p><i>Expected state:</i></p> <ul style="list-style-type: none">- HIFI set to Standby1 mode (not visible)- LCU commanding disabled

Doc No. : PT-HMOC-OPS-FOP-6001-OPS-OAH
Fop Issue : 3.1
Issue Date: 05/09/11

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Status : Version 8 - Updated
Last Checkin: 09/03/2011