

HIFI\_SwitchedOff\_to\_Intermediate\_Redundant  
 File: H\_FCP\_HIF\_RION.xls  
 Author: R. Biggins



## Procedure Summary

### Objectives

This procedure describes the steps to switch on the redundant HIFI ICU:  
 - Power on the ICU  
 - Enable HK for all HIFI units  
 - Set FCU (Focal-plane Control Unit) status to ON

Based on procedure:  
 HIFI\_SwitchedOff\_to\_Intermediate\_Redundant (v2)

### Summary of Constraints

HIFI redundant units powered OFF for at least 4 minutes

### Spacecraft Configuration

**Start of Procedure**

HIFI is OFF

**End of Procedure**

HIFI is in RESCUE/INTERMEDIATE mode

### Reference File(s)

**Input Command Sequences**

**Output Command Sequences**

HPHRION

### Referenced Displays

**ANDs**      **GRDs**      **SLDs**  
 ZAZ9C999

### Configuration Control Information

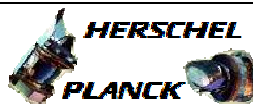
DATE	FOP ISSUE	VERSION	MODIFICATION DESCRIPTION	AUTHOR	SPR REF
08/11/07		1	Created	R. Biggins	
16/11/07		1.01	Validation : Editorial updates	R. Biggins	
08/01/08		2	Update due to initial testing against simulator: - Time tags updated - Bus profile selection TC added - BBID/OBSID TM checks added	R. Biggins	
29/02/08		3	Update due to testing against MOC Simulator and comments by D. Teyssier: - Telecommand flags updated - Editorial updates - 'Notify PDU status for FCU' step added	R. Biggins	

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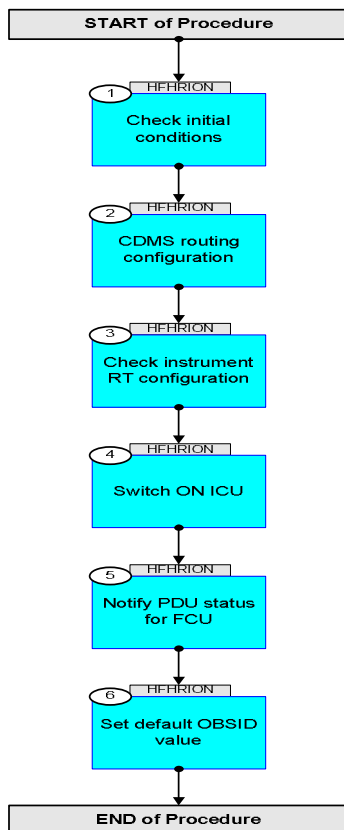


05/06/08	1	4	Updates due to SVT-1 testing: <input type="checkbox"/> - Start RT interrogation TC updated (step 4.3) <input type="checkbox"/> - Enable SDB FDIR TC moved from step 4.7 to step 4.5 <input type="checkbox"/> - TM checks added after Force Boot TC (step 4.6) <input type="checkbox"/> - AND updated for all TM parameters <input type="checkbox"/> - Comments added <input type="checkbox"/> - Flags updated	R. Biggins	
05/11/08		5	Updates due to new procedures from industry <input type="checkbox"/> - Step 4.2 and 4.3 merged <input type="checkbox"/> - TC DC005161 database definition updated	R. Biggins	
22/01/09	2	6	- Force Boot TC HC162289 replaced by HC163289 making the partition selectable <input type="checkbox"/> - TCs DC005161 updated and moved so that the ICU is switched on and booted during TFL_TM FDIR disabled (SDB FDIR enabled throughout) <input type="checkbox"/> - comments updated	R. Biggins	
19/02/09		7	Updates due to SVT-2/SOVT-2 testing <input type="checkbox"/> - SDB FDIR commanding updated <input type="checkbox"/> - Expected LCL current updated	R. Biggins	
19/02/09	2.1	7.01	Validation : Comments updated	R. Biggins	
07/04/09	2.3	7.02	Validation : Final updates before flight <input type="checkbox"/> - Summary updated <input type="checkbox"/> - Display of TC flags updated <input type="checkbox"/> - Procedure description/title updated	R. Biggins	
11/09/09	2.5	8	HK data rate updated to 1 packet per second	R. Biggins	

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## Procedure Flowchart Overview

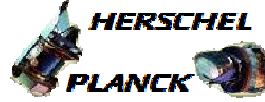


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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
<b>Beginning of Procedure</b>				
TC Seq. Name : HFHRION (Switch ON ICU (Red))				
TimeTag Type: N Sub Schedule ID:  <input type="checkbox"/>				
1		Check initial conditions		Next Step: 2
		Verify: Redundant HIFI units have been switched off for at least 4 minutes		
1.1		HSC/ICC input		<input type="checkbox"/>
		Verify that the HSC has supplied a valid OBSID value  OBS_ID = 0xnnnn nnnn		
		Verify that the HIFI ICC has indicated whether the ICU is to be booted from the primary or secondary partition (step 4.4)  DPU_PRTN = 1 or 2		
		Verify that the correct information has been supplied by the ICC:  ICU Software Version/Revision/Patch number		
1.2		Spacecraft mode		<input type="checkbox"/>
		Verify Telemetry  CurrentMode                      DEL34170                      = Nominal		AND=ZAZ9C999
		Verify Telemetry  ACC_A_MODE                      AEE8G050                      = Nominal		AND=ZAZ9C999
1.3		Bus status		<input type="checkbox"/>
		Verify Bus configuration		
		Verify: Active 1553 bus Active_Bus_A_B                      DEFJ1160                      = BUS_A		AND=ZAZ9C999
		Verify: 1553 bus FDIR status SDB_FDIR                      DEFJ4160                      = ENABLED		AND=ZAZ9C999
		Verify: SDB handling status BSW_SDB_ENAB                      DEF60160                      = ENABLED		AND=ZAZ9C999

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Verify bus health status		
		Verify: Bus (side A) health status <b>BusA_HealthySts</b> <b>DEFJ2160</b>	<b>= Healthy</b>	AND=ZAZ9C999
		Verify: Bus (side B) health status <b>BusB_HealthySts</b> <b>DEFJ3160</b>	<b>= Healthy</b>	AND=ZAZ9C999
1.4		Redundant instrument LCLs		<input type="checkbox"/>
		Verify: ICU LCL status <b>HiFiIcuR_L68_1S</b> <b>WM62D565</b>	<b>= OFF</b>	AND=ZAZ9C999
		Verify Telemetry <b>HiFiLcuR_L54_1S</b> <b>WM42D565</b>	<b>= OFF</b>	AND=ZAZ9C999
1.5		Nominal instrument LCLs		<input type="checkbox"/>
		Verify: ICU LCL status <b>HiFiIcuN_L64_1S</b> <b>WM52D565</b>	<b>= OFF</b>	AND=ZAZ9C999
		Verify: LCU LCL status <b>HiFiLcuN_L53_1S</b> <b>WM72D565</b>	<b>= OFF</b>	AND=ZAZ9C999
1.6		Common LCLs		<input type="checkbox"/>
		Verify: HRS-H LCL status <b>HiFiHRH_L63_1S</b> <b>WM52C565</b>	<b>= OFF</b>	AND=ZAZ9C999
		Verify: HRS-V LCL status <b>HiFiHRV_L67_1S</b> <b>WM62C565</b>	<b>= OFF</b>	AND=ZAZ9C999
		Verify: WBS-H LCL status <b>HiFiWEV_L43_S</b> <b>WM82A565</b>	<b>= OFF</b>	AND=ZAZ9C999
		Verify: WBS-V LCL status <b>HiFiWEV_L44_S</b> <b>WM32A565</b>	<b>= OFF</b>	AND=ZAZ9C999
2		CDMS routing configuration		Next Step: 3
	ET=+ UT=+00.00.00	Execute Telecommand  <b>RepDownlinkTMStorage</b>  TC Control Flags :  Subsch. ID : 10 Det. descr. : Report Telemetry Packets Down-linking/ Storage Status	<b>DC141160</b>  <b>GBM IL DSE</b> <b>--Y -- ---</b>	

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		It should be verified that ALL telemetry packets for HIFI APIDs should be transmitted to ground (Transmit_Flag = ENABLED) EXCEPT for TM(21,x) which should be stored in the SSMM (Storage_Flag = ENABLED, Transmit_Flag = DISABLED).  This should be verified on the VPD		
		<b>NOTE:</b> The flags should be set correctly by default so any incorrect settings should be investigated.		
		Verify Packet Reception <b>Telemetry Packets DownLinking-Storage Status Report</b> Packet Details:  APID: 16 Type: 14 Subtype: 7 PI1: PI2:	(14,7)-1400	
3		Check instrument RT configuration		Next Step: 4
3.1		Remote Terminal configuration		<input type="checkbox"/>
		Verify Telemetry HIFI_VitalNonV DED4G161	= NonVital	AND=ZAZ9C999
		Verify Telemetry HIFI_TmRetry DED4Z161	= ON	AND=ZAZ9C999
3.2		Remote Terminal Status		<input type="checkbox"/>
		Redundant units		
		Verify Telemetry HIFIB_OnOff DED11161	= OFF	AND=ZAZ9C999
		Verify Telemetry HIFIB_DeadAlive DED12161	= Alive	AND=ZAZ9C999
		Verify Telemetry HIFIB_WellsicTC DED13161	= Well	AND=ZAZ9C999
		Verify Telemetry HIFIB_WellsicTM DED14161	= Well	AND=ZAZ9C999
		Verify Telemetry HIFIB_ValidInv DED15161	= Invalid	AND=ZAZ9C999
		Nominal units		
		Verify Telemetry HIFIA_OnOff DEDZG161	= OFF	AND=ZAZ9C999

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Verify Telemetry HIFIA_DeadAlive DEDZH161	= Alive	AND=ZAZ9C999
		Verify Telemetry HIFIA_WellsicTC DEDZZ161	= Well	AND=ZAZ9C999
		Verify Telemetry HIFIA_WellsicTM DEDZJ161	= Well	AND=ZAZ9C999
		Verify Telemetry HIFIA_ValidInv DEDZK161	= Invalid	AND=ZAZ9C999
4		Switch ON ICU		Next Step: 5
4.1		Set Bus Profile		<input type="checkbox"/>
	ET=+ UT=+00.00.00	Execute Telecommand SelectActiveSCBP Command Parameter(s) : SCBP DH049160 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 10 Det. descr. : Select Active SCBP from SCBP Table	DC819160 SCBP_02	
		Verify: Bus profile BSW_SDB_ActProf DEF5F160	= 2 <dec>	AND=ZAZ9C999
4.2		Disable FDIR and enable RT interrogations		<input type="checkbox"/>
		<b>NOTE:</b> The following TC acts in the following order: - disables the FDIR for the whole spacecraft - updates the RTA status		
	ET=+ UT=+00.00.00	Execute Telecommand ConfiguresDBFDIR Command Parameter(s) : RTA DH011161 M0 DH030161 M1 DH031161 M2 DH032161 M3 DH033161 M4 DH034161 M5 DH035161 M6 DH036161 M7 DH037161 F0 DH018161 F1 DH019161	DC005161 HIFI B Update status Ignore Flag Ignore Flag Ignore Flag Update status Ignore Flag Update status Ignore Flag ON Alive	

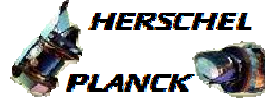
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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		F2 DH020161 F3 DH021161 F4 DH022161 F5 DH023161 F6 DH024161 F7 DH025161 M12 DH051161 M_C DH043161 M8 DH038161 M9 DH039161 M10 DH040161 M11 DH041161 F12 DH050161 CNT DH042161 F8 DH026161	Well TC Well TM Valid Non-vital REDUNDANT ON Ignore Flag Ignore CNT Ignore Flag Ignore Flag Ignore Flag Update status ENABLED LoopCnt1 Bus A	
		F9 DH027161 F10 DH028161 F11 DH029161  TC Control Flags :  Subsch. ID : 10 Det. descr. : Configure SDB FDIR  GBM IL DSE --Y -- ---	Healthy Healthy DISABLED	
		Wait up to 1 minute for the generation of the D_H_Hk_P64 packet from the CDMU (APID = 18)		
		Verify Telemetry SDB_FDIR DEFJ4160	= DISABLED	AND=ZAZ9C999
		Verify Telemetry HIFI_NomRed DED4H161	= REDUNDANT	AND=ZAZ9C999
		Verify Telemetry HIFIB_OnOff DED11161	= ON	AND=ZAZ9C999
		Verify Telemetry HIFIB_ValidInv DED15161	= Valid	AND=ZAZ9C999
4.3		Switch on ICU LCL		<input type="checkbox"/>
		Switching ON the ICU LCL will initialise BSW. This will initially execute memory checks (failures will generate TM(5,4) packets) and then generate TM(5,1) [HIFI_ready_event] packets every 10 seconds (for 210 seconds only).		
	ET=+ UT=+00.00.00	Execute Telecommand SwOn_HiFiICU_R_L68  TC Control Flags :  Subsch. ID : 10 Det. descr. : PCDU: TC(8,4,112,5) HIFI ICU Red - switch LCL_68 on  GBM IL DSE --Y -- ---	DC68D170	

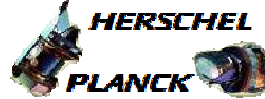


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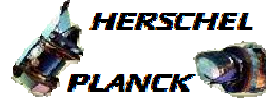
Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Verify: ICU LCL status <b>HiFiIcuR_L68_1S</b> <b>WM62D565</b>	= ON	AND=ZAZ9C999
		Verify: ICU LCL current (+/- 0.1A) <b>HiFiICU_R_L68_I</b> <b>WM609565</b>	= 1.0 A	AND=ZAZ9C999
		<b>CONTINGENCY:</b> If the <b>TM(5,1)</b> packet is not received or a <b>TM(5,4)</b> packet is received, HIFI is in RESCUE mode. The ICC should be contacted and the following procedure executed: H_CRP_HIF_RROF		
4.4		<i>DPU Force Boot</i>		□
		Sending the FORCE_BOOT TC will generate a <b>TM(5,1)</b> [HIFI_BSW_TC_acknowledge_event] packet from the BSW.		
	ET=+ UT=+00.00.00	Execute Telecommand <b>HIFI_force_bootpartition</b>  Command Parameter(s) : <b>HIF_partition_ID</b> <b>HP228197</b>  TC Control Flags :  <b>GBM IL DSE</b> <b>--Y -- ---</b>  Subsch. ID : 70 Det. descr. : Load OBS-image from specified EEPROM partition and boot	<b>HC163289</b>  <b>ICU_PRTN</b>	
		Verify that the following <b>TM(3,25)</b> packets are being generated:  <b>HIFI_R_essential_HK</b> (APID 1025) <b>HIFI_R_HK_rev_7</b> (APID 1027)		
		The following version check should ensure that the expected software version is running.		
		Verify Telemetry <b>HI_SW_Version</b> <b>HM010190</b>	<b>Version</b>	AND=ZAZ9C999
		Verify Telemetry <b>HI_SW_Revision</b> <b>HM011190</b>	<b>Revision</b>	AND=ZAZ9C999
		Verify Telemetry <b>HI_SW_Patch</b> <b>HM012190</b>	<b>Patch</b>	AND=ZAZ9C999
4.5		<i>Re-enable FDIR</i>		□

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
	ET=+ UT=+00.00.00	Execute Telecommand  ConfiguresSDBFDIR  Command Parameter(s) : RTA            DH011161 M0            DH030161 M1            DH031161 M2            DH032161 M3            DH033161 M4            DH034161 M5            DH035161 M6            DH036161 M7            DH037161 F0            DH018161 F1            DH019161	DC005161  HIFI B Ignore Flag Ignore Flag Ignore Flag Ignore Flag Ignore Flag Ignore Flag Ignore Flag Ignore Flag ON Alive	
		F2            DH020161 F3            DH021161 F4            DH022161 F5            DH023161 F6            DH024161 F7            DH025161 M12          DH051161 M_C          DH043161 M8            DH038161 M9            DH039161 M10          DH040161 M11          DH041161 F12          DH050161 CNT          DH042161 F8            DH026161	Well TC Well TM Valid Non-vital NOMINAL ON Ignore Flag Ignore CNT Ignore Flag Ignore Flag Ignore Flag Update status ENABLED LoopCnt1 Bus A	
		F9            DH027161 F10          DH028161 F11          DH029161  TC Control Flags :  Subsch. ID : 10 Det. descr. : Configure SDB FDIR  GBM IL DSE ---Y ---	Healthy Healthy ENABLED	
		Wait up to 1 minute for the generation of the D_H_Hk_P64 packet from the CDMU (APID = 18)		
		Verify Telemetry  SDB_FDIR            DEFJ4160	= ENABLED	AND=ZAZ9C999
4.6		Adjust HK data rate		□

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	ET=+ UT=+00.00.05	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   1EF40001 <hex> OBS_ID	
		Verify Telemetry  BB_ID_per_hk           HM004190	= 1EF40001 <hex>	AND=ZAZ9C999
		Verify Telemetry  OBS_ID_per_hk         HM003190	OBS_ID	AND=ZAZ9C999
	ET=+ UT=+00.00.00	HIFI_Housekeeping_on  HIFI_Housekeeping_on  Command Parameter(s) : HIF_HK_rate         HP012197 HIF_FCU_S           HP006197 HIF_LCU_S           HP007197 HIF_WBSV_S         HP009197 HIF_WBSH_S         HP008197 HIF_HRSV_S         HP011197 HIF_HRSH_S         HP010197  TC Control Flags :  GBM IL DSE --Y -- ---	HC016289   1_pkt_per_s ON (Def) ON (Def) ON (Def) ON (Def) ON (Def) ON (Def)	
		Subsch. ID : 70 Det. descr. : Sets periodic housekeeping packet generation period		
		Verify that the following <b>TM(3,25)</b> packets are being generated every 4 seconds:  HIFI_R_essential_HK (APID 1025) HIFI_R_HK_rev_7     (APID 1027)		
5		Notify PDU status for FCU		Next Step: 6

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
	ET=+ UT=+00.00.01	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  1DE70001 <hex> OBS_ID	
		Verify Telemetry  BB_ID_per_hk           HM004190	= 1DE70001 <hex>	AND=ZAZ9C999
		Verify Telemetry  OBS_ID_per_hk         HM003190	OBS_ID	AND=ZAZ9C999
	ET=+ UT=+00.00.00	HIFI_notify_PDU_status  HIFI_notify_PDU_status  Command Parameter(s) : HIF_FCU_S            HP006197    ON HIF_LCU_S            HP007197    OFF (Def) HIF_WBSV_S           HP009197    OFF (Def) HIF_WBSH_S           HP008197    OFF (Def) HIF_HRSV_S           HP011197    OFF (Def) HIF_HRSR_S           HP010197    OFF (Def)  TC Control Flags : GBM IL DSE --Y -- ---  Subsch. ID : 70	HC015289  ON OFF (Def) OFF (Def) OFF (Def) OFF (Def) OFF (Def)	
		Det. descr. : Notifies the power status of the subssystems to the OBS		
		Verify Telemetry  HI_FCU_S             HM000191	= ON	AND=ZAZ9C999
		Verify that the parameters in the AND HA037289 are being received and are valid		
6		Set default OBSID value		Next Step: END
	ET=+ UT=+00.00.01	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  0 <hex> (Def) 0 <hex> (Def)	

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		Verify Telemetry BB_ID_per_hk                      HM004190	= 0 <hex>	AND=ZAZ9C999
		Verify Telemetry OBS_ID_per_hk                      HM003190	= 0 <hex>	AND=ZAZ9C999
<b>End of Procedure</b>				