

FPU functional test  
 File: H\_COP\_HIF\_NFF8.xls  
 Author: R. Biggins



## Procedure Summary

### Objectives

The objective of this procedure is to execute a functional test on band 8 of the FPU

- Initialise FPU
- Execute FPU heater test

Based on procedure:  
 HIFI-COP-1.2-FPU\_FT (v6)

### Summary of Constraints

Real-time science packets should be enabled for downlink for HIFI analysis

### Spacecraft Configuration

**Start of Procedure**

n/a

**End of Procedure**

n/a

### Reference File(s)

**Input Command Sequences**

**Output Command Sequences**

HCHNFF8

### Referenced Displays

<b>ANDs</b>	<b>GRDs</b>	<b>SLDs</b>
ZAZ9C999		
HA038289		
HA039289		

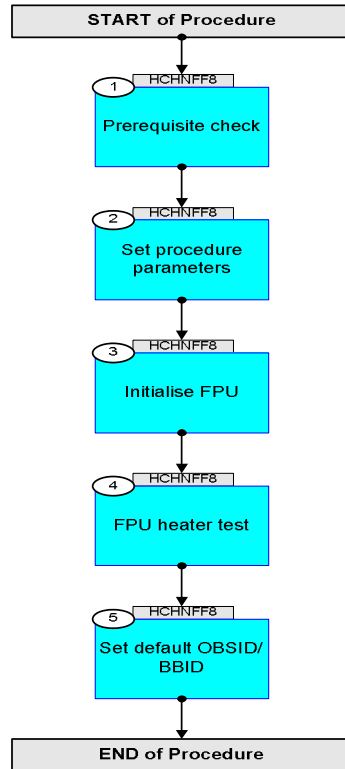
### Configuration Control Information

DATE	FOP ISSUE	VERSION	MODIFICATION DESCRIPTION	AUTHOR	SPR REF
27/10/08	2	1	Created	R. Biggins	
			Updates due to SVT-2/SOVT-2 testing <input type="checkbox"/>		
			<input type="checkbox"/>		
24/02/09	2.1	2	- Summary updated <input type="checkbox"/> - TCs Set_OBS_ID and HIFI_non_periodic_hk_FCU removed from step 4	R. Biggins	
			Changes based on updates from D. Teyssier <input type="checkbox"/>		
07/04/09	2.3	3	- TC flags updated <input type="checkbox"/> - Parameter values in step 4 updated	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 : HCHNFF8 (FPU functional test)				
TimeTag Type: B Sub Schedule ID:  □				
1		Prerequisite check		Next Step: 2
1.1		HSC/ICC input		□
		Verify that the HSC/ICC has supplied a valid OBSID value:  OBS_ID = 0xnnnn nnnn		
2		Set procedure parameters		Next Step: 3
	ET=+00.00.01 UT=+00.00.01	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	HIFI_Set_OBS_ID  HC014289  17700001 <hex> OBS_ID	
		Verify Telemetry BB_ID_per_hk                  HM004190	= 17700001 <hex>	AND=ZAZ9C999
		Verify Telemetry OBS_ID_per_hk                  HM003190	OBS_ID	AND=ZAZ9C999
	ET=+00.00.00 UT=+00.00.00	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_HRSR_S                  HP010197  TC Control Flags : GBM IL DSE --- -- --	HIFI_Housekeeping_on  HC016289  1_pkt_per_s ON (Def) ON (Def) ON (Def) ON (Def) ON (Def) ON (Def)	

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch																																	
		Subsch. ID : 70 Det. descr. : Sets periodic housekeeping packet generation period																																			
		Verify: The following TM(3,25) packets should be produced once every second:  HIFI_essential_HK (APID 1024) HIFI_HK_rev_7 (APID 1026)																																			
3		Initialise FPU		Next Step: 4																																	
	ET=+00.00.01 UT=+00.00.01	HIFI_Configure_FCU_Power  Command Parameter(s) : <table border="0"> <tr><td>HIFI_BB_ID</td><td>HP001197</td><td>1C200001 &lt;hex&gt;</td></tr> <tr><td>HF_CPR_Mixer_H_S</td><td>HP203191</td><td>ON (Def)</td></tr> <tr><td>HF_CPR_Mixer_V_S</td><td>HP204191</td><td>ON (Def)</td></tr> <tr><td>HF_CPR_Chopper_S</td><td>HP205191</td><td>ON (Def)</td></tr> <tr><td>HF_CPR_UCH_S</td><td>HP206191</td><td>ON (Def)</td></tr> <tr><td>HF_CPR_UCV_S</td><td>HP207191</td><td>ON (Def)</td></tr> </table> TC Control Flags : <table border="0"> <tr><td>GBM IL DSE</td></tr> <tr><td>--Y -- ---</td></tr> </table> Subsch. ID : 70	HIFI_BB_ID	HP001197	1C200001 <hex>	HF_CPR_Mixer_H_S	HP203191	ON (Def)	HF_CPR_Mixer_V_S	HP204191	ON (Def)	HF_CPR_Chopper_S	HP205191	ON (Def)	HF_CPR_UCH_S	HP206191	ON (Def)	HF_CPR_UCV_S	HP207191	ON (Def)	GBM IL DSE	--Y -- ---	HC027289														
HIFI_BB_ID	HP001197	1C200001 <hex>																																			
HF_CPR_Mixer_H_S	HP203191	ON (Def)																																			
HF_CPR_Mixer_V_S	HP204191	ON (Def)																																			
HF_CPR_Chopper_S	HP205191	ON (Def)																																			
HF_CPR_UCH_S	HP206191	ON (Def)																																			
HF_CPR_UCV_S	HP207191	ON (Def)																																			
GBM IL DSE																																					
--Y -- ---																																					
		Det. descr. : Switch ON or OFF the five FCU-boards (mixer H/V, chopper, IF HV)																																			
		Verify Telemetry  BB_ID_per_hk                      HM004190	= 1C200001 <hex>	AND=ZAZ9C999																																	
	ET=+00.00.00 UT=+00.00.00	HIFI_P_Configure_FCU  Command Parameter(s) : <table border="0"> <tr><td>HIFI_BB_ID</td><td>HP001197</td><td>1C200001 &lt;hex&gt;</td></tr> <tr><td>HF_CPR_MX BAND</td><td>HP202191</td><td>0 &lt;dec&gt; (Def)</td></tr> <tr><td>HF_CH1_DPFP P1</td><td>HP176191</td><td>0 &lt;dec&gt;</td></tr> <tr><td>HF_CH2_FIF1_Drain_V</td><td>HP177191</td><td>0.75 V</td></tr> <tr><td>HF_CH2_FIF1_Drain_C</td><td>HP178191</td><td>4.0 mA</td></tr> <tr><td>HF_CH2_FIF2_Drain_V</td><td>HP179191</td><td>0.65 V</td></tr> <tr><td>HF_CH2_FIF2_Drain_C</td><td>HP180191</td><td>3.0 mA</td></tr> <tr><td>HF_CH2_SIF1_Drain_V</td><td>HP181191</td><td>0.82 V</td></tr> <tr><td>HF_CH2_SIF1_Drain_C</td><td>HP182191</td><td>2.5 mA</td></tr> <tr><td>HF_CH2_SIF2_Drain_V</td><td>HP183191</td><td>0.8 V</td></tr> <tr><td>HF_CH2_SIF2_Drain_C</td><td>HP184191</td><td>1.9 mA</td></tr> </table>	HIFI_BB_ID	HP001197	1C200001 <hex>	HF_CPR_MX BAND	HP202191	0 <dec> (Def)	HF_CH1_DPFP P1	HP176191	0 <dec>	HF_CH2_FIF1_Drain_V	HP177191	0.75 V	HF_CH2_FIF1_Drain_C	HP178191	4.0 mA	HF_CH2_FIF2_Drain_V	HP179191	0.65 V	HF_CH2_FIF2_Drain_C	HP180191	3.0 mA	HF_CH2_SIF1_Drain_V	HP181191	0.82 V	HF_CH2_SIF1_Drain_C	HP182191	2.5 mA	HF_CH2_SIF2_Drain_V	HP183191	0.8 V	HF_CH2_SIF2_Drain_C	HP184191	1.9 mA	HC182289	
HIFI_BB_ID	HP001197	1C200001 <hex>																																			
HF_CPR_MX BAND	HP202191	0 <dec> (Def)																																			
HF_CH1_DPFP P1	HP176191	0 <dec>																																			
HF_CH2_FIF1_Drain_V	HP177191	0.75 V																																			
HF_CH2_FIF1_Drain_C	HP178191	4.0 mA																																			
HF_CH2_FIF2_Drain_V	HP179191	0.65 V																																			
HF_CH2_FIF2_Drain_C	HP180191	3.0 mA																																			
HF_CH2_SIF1_Drain_V	HP181191	0.82 V																																			
HF_CH2_SIF1_Drain_C	HP182191	2.5 mA																																			
HF_CH2_SIF2_Drain_V	HP183191	0.8 V																																			
HF_CH2_SIF2_Drain_C	HP184191	1.9 mA																																			

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		HF_CH2_SIF3_Drain_V HP185191 HF_CH2_SIF3_Drain_C HP186191 HF_CV1_DPFPF1 HP191191 HF_CV2_FIF1_Drain_V HP192191 HF_CV2_FIF1_Drain_C HP193191 HF_CV2_FIF2_Drain_V HP194191 HF_CV2_FIF2_Drain_C HP195191 HF_CV2_SIF1_Drain_V HP196191 HF_CV2_SIF1_Drain_C HP197191 HF_CV2_SIF2_Drain_V HP198191 HF_CV2_SIF2_Drain_C HP199191 HF_CV2_SIF3_Drain_V HP200191 HF_CV2_SIF3_Drain_C HP201191 HF_CPR_CH_SINE_S HP211191 HF_CPR_CH_LOOP_S HP210191	0.65 V 3.0 mA 0 <dec> 0.75 V 4.0 mA 0.65 V 3.0 mA 0.77 V 3.0 mA 0.9 V 1.55 mA 0.75 V 2.5 mA ON (Def) CLOSE (Def)	
		HF_CPR_CHFPG1 HP212191 HF_CPR_CHFPG2 HP213191 HF_CPR_CHFPZ1 HP214191 HF_CPR_CHFPZ2 HP215191 HF_CPR_CHFPP2 HP216191 HF_CPR_Cal_Heater_C HP217191 HF_CH1_MXBIAS_V HP172191 HF_CH1_MX_MG_C HP173191 HF_CV1_MXBIAS_V HP187191 HF_CV1_MX_MG_C HP188191 HF_P_Chopper_Rot HP454191 HF_CH1_DFACT_C HP174191 HF_CV1_DFACT_C HP189191	17 <dec> 201 <dec> 1010 <dec> 885 <dec> 149 <dec> 1.1 mA 2.1 mV 15.0 mA 2.1 mV 15.0 mA -1.07 V 0.0 mA 0.0 mA	
		GBM IL DSE --Y -- -- Subsch. ID : 70 Det. descr. : Configure the FCU-subsystem (prime)		
	ET=+00.00.03 UT=+00.00.03	HIFI_CH1_MX_MG_C HIFI_CH1_MX_MG_C Command Parameter(s) : HIFI_BB_ID HP001197 HF_CH1_MX_MG_C HP173191 Subsch. ID : 70 Det. descr. : Send single command to set H mixer magnet current	HC096289 1C200001 <hex> 8.3 mA	
	ET=+00.00.00 UT=+00.00.00	HIFI_CV1_MX_MG_C HIFI_CV1_MX_MG_C Command Parameter(s) : HIFI_BB_ID HP001197 HF_CV1_MX_MG_C HP188191 Subsch. ID : 70 Det. descr. : Send single command to set V mixer magnet current	HC099289 1C200001 <hex> 8.2 mA	
		Verify: Verify the content of the following ANDs with the HIFI representative:		

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		HA038289 FCU_H_device HA039289 FCU_V_device HA042289 FCU_PR_power HA044289 FCU_common		
4		FPU heater test		Next Step: 5
	ET=+00.00.01 UT=+00.00.01	HIFI_CH1_MX_MG_C  HIFI_CH1_MX_MG_C  Command Parameter(s) : HIFI_BB_ID                  HP001197 HF_CH1_MX_MG_C          HP173191  TC Control Flags :  GBM IL DSE --Y -- ---  Subsch. ID : 70 Det. descr. : Send single command to set H mixer magnet current	HC096289  CA80001 <hex> 0.0 mA (Def)	
	ET=+00.00.00 UT=+00.00.00	HIFI_CV1_MX_MG_C  HIFI_CV1_MX_MG_C  Command Parameter(s) : HIFI_BB_ID                  HP001197 HF_CV1_MX_MG_C          HP188191  Subsch. ID : 70 Det. descr. : Send single command to set V mixer magnet current	HC099289  CA80001 <hex> 0.0 mA (Def)	
		Verify: In the 2 seconds following the upcoming TC, the following parameter (HF_AH1_DHTR_C) should increase in the vicinity of 17mA, then drop to its initial value.		
	ET=+00.00.01 UT=+00.00.01	HIFI_HF_CH1_DHTR_C  HIFI_HF_CH1_DHTR_C  Command Parameter(s) : HIFI_BB_ID                  HP001197 HF_CH1_DHTR_P          HP218191  TC Control Flags :  GBM IL DSE --Y -- ---  Subsch. ID : 70 Det. descr. : Send single command to generate a H deflux heater pulse	HC093289  CA80001 <hex> 3000.0 ms	
		Verify Telemetry  HF_AH1_DHTR_C                  HM042191	see above	AND=HA038289
		Verify: In the 2 seconds following the upcoming TC, the following parameter (HF_AV1_DHTR_C) should increase in the vicinity of 17mA, then drop to its initial value.		

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
	ET=+00.00.04 UT=+00.00.04	HIFI_HF_CV1_DHTR_C  HIFI_HF_CV1_DHTR_C  Command Parameter(s) : HIFI_BB_ID                  HP001197 HF_CV1_DHTR_P              HP219191  TC Control Flags :  GBM IL DSE --Y -- ---  Subsch. ID : 70 Det. descr. : Send single command to generate a V deflux heater pulse	HC094289  CA80001 <hex> 3000.0 ms	
		Verify Telemetry  HF_AV1_DHTR_C                  HM133191	see above	AND=HA039289
	ET=+00.01.04 UT=+00.01.04	HIFI_CH1_MX_MG_C  HIFI_CH1_MX_MG_C  Command Parameter(s) : HIFI_BB_ID                  HP001197 HF_CH1_MX_MG_C              HP173191  Subsch. ID : 70 Det. descr. : Send single command to set H mixer magnet current	HC096289  CA80001 <hex> 15.0 mA	
	ET=+00.00.00 UT=+00.00.00	HIFI_CV1_MX_MG_C  HIFI_CV1_MX_MG_C  Command Parameter(s) : HIFI_BB_ID                  HP001197 HF_CV1_MX_MG_C              HP188191  Subsch. ID : 70 Det. descr. : Send single command to set V mixer magnet current	HC099289  CA80001 <hex> 15.0 mA	
	ET=+00.00.01 UT=+00.00.01	HIFI_CH1_MX_MG_C  HIFI_CH1_MX_MG_C  Command Parameter(s) : HIFI_BB_ID                  HP001197 HF_CH1_MX_MG_C              HP173191  Subsch. ID : 70 Det. descr. : Send single command to set H mixer magnet current	HC096289  CA80001 <hex> 8.3 mA	
	ET=+00.00.00 UT=+00.00.00	HIFI_CV1_MX_MG_C  HIFI_CV1_MX_MG_C  Command Parameter(s) : HIFI_BB_ID                  HP001197 HF_CV1_MX_MG_C              HP188191  Subsch. ID : 70 Det. descr. : Send single command to set V mixer magnet current	HC099289  CA80001 <hex> 8.2 mA	

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
	ET=+00.00.01 UT=+00.00.01	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  Subsch. ID : 70 Det. descr. : Sets periodic housekeeping packet generation period	HC016289  1_pkt_per_4_s ON (Def) ON (Def) ON (Def) ON (Def) ON (Def) ON (Def)	
		Verify: The following <b>TM(3,25)</b> packets should be produced once every 4 seconds:  HIFI_essential_HK (APID 1024) HIFI_HK_rev_7 (APID 1026)		
5		Set default OBSID/BBID		Next Step: END
	ET=+00.00.01 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)	
		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>				