5.13_V1.0 EXIT BAKEOUT: FP to -60 C, DH to $+20$ C

Last Revised: October 6, 2003
Filename: exit_bake_FPm60_DHp20

BRIEF FUNCTIONAL DESCRIPTION:

This procedure takes the instrument out of the bakeout mode which set the detector housing (DH) temperature to $\sim +20.0$ C and the focal plane (FP) to ~ -60.0 C and restores it to the canonical thermal standby state. The procedure first turns off the DH heaters and waits for the DH to cool to ~ -55.0 C. It will take the DH about 12 hr to reach -55.0 C. Once the DH is cold, then the FP bakeout heater is turned off and the FP is allowed to cool to -120 C. This procedure takes a long time to execute, but the vast majority of that time is spent waiting for the DH and/or FP to cool. Please note that the FP is commanded to a set point of -121.0 C, since the set point apparently shifted after launch.

The sequence of actions will be:

1. Verify the initial Camera Body, Warm & Cold Radiators and FP temperatures
2. Turn off the DH bakeout heater and begin cooling the DH to -60 C
3. Disable the FP bakeout and cool the FP to -120 C
4. Monitor the FP temperature as it cools to -120 C
5. Translate the SIM to the HRC-S position

ASSUMED INSTRUMENT STATE:

Assumes the instrument is in the bakeout mode with the FP and DH bakeout heaters on and the FP temperature at -60 C and the DH temperature at +22.8/17.8 C.
Assumes the video boards and FEPs are off.

SPECIAL INITIAL CONDITIONS:

OPERATIONAL CONSTRAINTS/CAUTIONS:

REFERENCES:

ACIS Long Form Functional Test Procedure (36-01301.01)
SOT procedure 2.13_V2.0 “Exit Full Bakeout and Return to Thermal Standby Mode”

CHANGE HISTORY:

V1.0

- adapted from SOT procedure 2.13_V2.0 “Exit Full Bakeout and Return to Thermal Standby Mode”, corresponding FOT procedure is SAP_61076

Table 1: **Exit Bakeout: FP to -60 C, DH to $+20$ C and Return to Thermal Standby Mode**

Step #	Title (Revision 5.13_V1.0)	Time Req (m)	Command Description	Command Mnemonic	Telemetry Description	Telemetry Mnemonic	Expected Value	Units
1.0	Verify Initial Temperatures							
1.1	Verify SIM position	1			SIM TT Position	3TSCPOS	75624	
1.2	Verify HW Temperatures				Camera Body T A	1CBAT	$+22.8 \pm 2$	C
					Camera Body T B	1CBBT	$+17.8 \pm 2$	C
					Cold Radiator T A	1CRAT	~ -50.0	C
					Cold Radiator T B	1CRBT	~ -47.5	C
					Warm Radiator T A	1WRAT	~ -37.6	C
					Warm Radiator T B	1WRBT	~ -37.6	C
1.2	verify FP temperature	2			FP Temp		~ -60.0	C
2.0	Start Cooling DH to -60 C							
2.1	Housing Bakeout Off B	1	Housing B.O. Off B	1HBOBOF	DA BO B On/Off	1DABOBON	OFF	
					DA Htr Output V B	1DAHBVO	0.0	V
					DA Htr Current B	1DAHBCU	0.0	A
2.2	Housing Bakeout Dis B	1	Housing B.O. Dis B	1HBOBDS	DA BO B Enb/Dis	1DABOBEN	DIS	
2.3	monitor Camera Body temp	720			Camera Body T A	1CBAT	$< +22.8$	C
					Camera Body T B	1CBBT	$< +17.8$	C
3.0	Disable FP bakeout							
3.1	Verify Camera Body Temp	10			Camera Body T A	1CBAT	≤ -55.0	C
					Camera Body T B	1CBBT	≤ -55.0	C
3.2	set FP temp to -121 C	2	ChangeConfigSetting	WSFTNEG121				
3.3	turn off FP bakeout htr	2	ChangeConfigSetting	WSBAKDSABL				
3.4	disable bakeout patch	2	writeBep	WBBOEN_DIS				
3.5	set warm boot flag on	0.1	DPA Warm Boot	1WRMBTSB(1)				
3.6	Halt BEP	0.1	DPA Command Reset	1RSETIRT(1)				
3.7	Restart BEP	0.1	DPA Command Reset	1RSETIRT(0)				
3.8	Check BEP A Boot	2.0						

Table 2: (CONT) **Exit Bakeout: FP to −60 C, DH to +20 C and Return to Thermal Standby Mode**

Step #	Telemetry EGSE	Other Verifier	Crit	Description	Notes	RT Con	Tlm Fmt	Min Alt	SIM Pos
1.0									
1.1			1	should be at ACIS-S		Y	1or2		
1.2			2	should be at $+22.8 \pm 2$ C		Y	1or2		
			2	should be at $+17.8 \pm 2$ C					
			2						
			2						
1.2	deaHousekeepingData		A	verify FP temp stable at desired temp.		Y	1or2		
2.0									
2.1						Y	1or2		
			1	voltage should drop to 0					
			1	current should drop to zero					
2.2						Y	1or2		
2.3			2	wait for a significant		P	1or2		
			2	drop below $+22.8/17.8 \pm 2$ C					
3.0									
3.1			2	should be at ≤ -55.0 C		Y	1or2		
			2						
3.2	Check cmdResult == 1		A			Y	1or2		
	commandEcho 1220								
3.3	Check cmdResult == 1		A			Y	1or2		
	commandEcho 116					Y	1or2		
3.4	Check cmdResult == 1		A			Y	1or2		
	commandEcho 99								
3.5			2			Y	1or2		
3.6			2	1RSETIRT=1 holds board in reset		Y	1or2		
3.7			2	1RSETIRT=0 releases board		Y	1or2		
3.8	Check bepStartupMessage:		A			Y	1or2		
	bepTickCounter < 10; warmbootFlag =1;		A						
	watchdogFlag = 0, patchValidFlag =1		A						
	Check swHousekeeping messages:								

Table 1: **Exit Bakeout: FP to -60 C, DH to $+20$ C and Return to Thermal Standby Mode (Page 2)**

Step #	Title (Revision 5.13_V1.0)	Time Req (m)	Command Description	Command Mnemonic	Telemetry Description	Telemetry Mnemonic	Expected Value	Units
3.9	Check HW LEDs	2.0			BEP Select	1STAT4ST	0	
					BEP FIFO Not Full	1STAT6ST	1	
					BEP FIFO Not Empty	1STAT7ST	0	
3.10	Check SW LEDs	2.0			BEP initialization	1STAT3ST	0	
					Watchdog boot	1STAT2ST	1	
					Science run status	1STAT1ST	1	
						1STAT0ST	0or1	
4.0	Monitor FP Temp							
4.1	Load Board 11 DEA HK	1	loadDeaBlock	WD00001024				
4.2	Start DEA Hkp run	1	startDEA	XDZ0000005				
4.3	dump system config.	0.1	dumpSysConfig	RS_0000001				
4.4	Monitor FP temp	30			FP Temp		< -60	C
5.0	Translate SIM to HRC-S							
5.1	FOT translates SIM to HRC-S	5						
5.2	Verify SIM position	1			SIM TT Position	3TSCPOS	-99616	
	Total Time	785.4						

Table 2: (CONT) **Exit Bakeout: FP to** -60 **C, DH to** $+20$ **C and Return to Thermal Standby Mode (Page 2)**

Step #	Telemetry EGSE	Other Verifier	Crit	Description	Notes	RT Con	Tlm Fmt	Min Alt	SIM Pos
	startingBepTickCounter < 10;		B						
	endingBepTickCounter=		B						
	=startingBepTickCounter+640;								
	ACIS EGSE verifies "version"								
	field == 30 decimal								
3.9			2	0 indicates BEP A is selected		Y	1or2		
			2	1 means FIFO not full					
			2	1 means FIFO not empty					
3.10			2	0 means BEP SW is running		Y	1or2		
			2	1 means no watchdog boot					
			2	1 means science idle					
			2	this bit toggles to indicate BEP is running					
4.0									
4.1	Check cmdResult == OK		B	Load Fullhouse DEA housekeeping		Y	1or2		
	commandEcho 225			parameter block into slot 4					
4.2	Check cmdResult == OK		B	get FP temp from DEA HKP data		Y	1or2		
	commandEcho 18								
4.3	Check cmdResult == OK		B			Y	1or2		
	commandEcho 66								
4.4	deaHousekeepingData		A	after $\sim 1/2$ hr, should be convinced temp is		Y	1or2		
				dropping, objective is stabilization at -120 C		P	1or2		
5.0									
5.1			1			Y	1or2		
5.2			1	should be at HRC-S		Y	1or2		