2.13_V2.0 EXIT FULL BAKEOUT AND RETURN TO THERMAL STANDBY MODE

Last Revised: June 28,1999
Filename: full_bkout_off

BRIEF FUNCTIONAL DESCRIPTION:
BRIEF FUNCTIONAL DESCRIPTION: This procedure takes the instrument out of full bakeout mode and restores it to the canonical thermal standby state. The procedure gradually walks the focal plane temperature down in 10 C steps since the DH (and the focal plane for that matter) cool so slowly but always keeps the focal plane warmer than the DH. It will take roughly 14 hours to execute this entire procedure, but most of that time is spent waiting for temperatures to decrease to the specified values.

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. Gradually lower the FP temperature in 10 C steps, always keeping the FP warmer than the DH
4. Disable the FP bakeout and cool the FP to -120 C
5. Monitor the FP temperature as it cools to -120 C

ASSUMED INSTRUMENT STATE:
Assumes the instrument is in the full bakeout mode with the FP and DH bakeout heaters on and the FP temperature at +30 C and the DH temperature at +25 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)
CHANGE HISTORY:

V1.0

- initial release, started by modifying steps 5–7 of the old "full_bakeout" procedure

V2.0

- ACIS Team signed-off version
- changed the expected value of the warm and cold radiators in step 1.1
- changed time required in steps 3.3–3.7 to 60 m instead of 30 m
- changed expected value of HW TLM verifier "1STAT7ST" in step 4.9

Table 1: **Exit Full Bakeout and Return to Thermal Standby Mode**

Step #	Title (Revision 2.13_V2.0)	Time Req (m)	Command Description	Command Mnemonic	Telemetry Description	Telemetry Mnemonic	Expected Value	Units
1.0	Verify Initial Temperatures							
1.1	Verify HW Temperatures				Camera Body T A	1CBAT	$+25 \pm 2$	C
					Camera Body T B	1CBBT	$+25 \pm 2$	C
					Cold Radiator T A	1CRAT	~ -44	C
					Cold Radiator T B	1CRBT	~ -44	C
					Warm Radiator T A	1WRAT	~ -32	C
					Warm Radiator T B	1WRBT	~ -32	C
1.2	verify FP temperature	2			FP Temp		$\sim +30$	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	60			Camera Body T A	1CBAT	$< +25$	C
					Camera Body T B	1CBBT	$< +25$	C
3.0	Drop FP temp gradually							
3.1	drop FP temp to +20 C	30	ChangeConfigSetting	WSFTPOS_20	FP Temp		+20	C
3.2	drop FP temp to +10 C	30	ChangeConfigSetting	WSFTPOS_10	FP Temp		+10	C
3.3	drop FP temp to +0 C	60	ChangeConfigSetting	WSFTPOS_00	FP Temp		0	C
3.4	drop FP temp to -10 C	60	ChangeConfigSetting	WSFTNEG_10	FP Temp		-10	C
3.5	drop FP temp to -20 C	60	ChangeConfigSetting	WSFTNEG_20	FP Temp		-20	C
3.6	drop FP temp to -30 C	60	ChangeConfigSetting	WSFTNEG_30	FP Temp		-30	C
3.7	drop FP temp to -40 C	60	ChangeConfigSetting	WSFTNEG_40	FP Temp		-40	C
4.0	Disable FP bakeout							
4.1	Verify Camera Body Temp	60			Camera Body T A	1CBAT	-60	C

Table 2: (CONT) **Exit Full Bakeout 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			2	should be at $+25 \pm 2$ C		Y	1or2		
			2	should be at $+25 \pm 2$ 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 $+25 \pm 2$ C					
3.0									
3.1	Check cmdResult = 1		A	after Camera Body temp is $< +20$ C		Y	1or2		
	commandEcho 225			deaHousekeepingData					
3.2	Check cmdResult = 1		A	after Camera Body temp is $< +10$ C		Y	1or2		
	commandEcho 226			deaHousekeepingData					
3.3	Check cmdResult = 1		A	after Camera Body temp is < 0 C		Y	1or2		
	commandEcho 228			deaHousekeepingData					
3.4	Check cmdResult = 1		A	after Camera Body temp is < -10 C		Y	1or2		
	commandEcho 231			deaHousekeepingData					
3.5	Check cmdResult = 1		A	after Camera Body temp is < -20 C		Y	1or2		
	commandEcho 232			deaHousekeepingData					
3.6	Check cmdResult = 1		A	after Camera Body temp is < -30 C		Y	1or2		
	commandEcho 235			deaHousekeepingData					
3.7	Check cmdResult = 1		A	after Camera Body temp is < -40 C		Y	1or2		
	commandEcho 237			deaHousekeepingData					
4.0									
4.1			2	should be at -60 C		Y	1or2		

Table 1: **Exit Full Bakeout and Return to Thermal Standby Mode (Page 2)**

Step #	Title (Revision 2.13_V2.0)	Time Req (m)	Command Description	Command Mnemonic	Telemetry Description	Telemetry Mnemonic	Expected Value	Units
					Camera Body T B	1CBBT	-60	C
4.2	set FP temp to -120 C	2	ChangeConfigSetting	WSFTNEG120				
4.3	turn off FP bakeout htr	2	ChangeConfigSetting	WSBAKDSABL				
4.4	disable bakeout patch	2	writeBep	WBBOEN_DIS				
4.5	set warm boot flag on	0.1	DPA Warm Boot	1WRMBTSB(1)				
4.6	Halt BEP	0.1	DPA Command Reset	1RSETIRT(1)				
4.7	Restart BEP	0.1	DPA Command Reset	1RSETIRT(0)				
4.8	Check BEP A Boot	2.0						
4.9	Check HW LEDs	2.0			BEP Select	1STAT4ST	0	
					BEP FIFO Not Full	1STAT6ST	1	
					BEP FIFO Not Empty	1STAT7ST	0	
4.10	Check SW LEDs	2.0			BEP initialization	1STAT3ST	0	
					Watchdog boot	1STAT2ST	1	
					Science run status	1STAT1ST	1	
						1STAT0ST	0or1	
5.0	Monitor FP Temp							
5.1	Load Board 11 DEA HK	1	loadDeaBlock	WD00001024				
5.2	Start DEA Hkp run	1	startDEA	XDZ0000005				
5.3	dump system config.	0.1	dumpSysConfig	RS_0000001				
5.4	Monitor FP temp	480			FP Temp		< -60	C

Table 2: (CONT) **Exit Full Bakeout and Return to Thermal Standby Mode (Page 2)**

Step #	Telemetry EGSE	Other Verifier	Crit	Description	Notes	RT Con	Tlm Fmt	Min Alt	SIM Pos
			2						
4.2	Check cmdResult == 1		A			Y	1or2		
	commandEcho 105								
4.3	Check cmdResult == 1		A			Y	1or2		
	commandEcho 116					Y	1or2		
4.4	Check cmdResult == 1		A			Y	1or2		
	commandEcho 99								
4.5			2			Y	1or2		
4.6			2	1RSETIRT=1 holds board in reset		Y	1or2		
4.7			2	1RSETIRT=0 releases board		Y	1or2		
4.8	Check bepStartupMessage:		A			Y	1or2		
	bepTickCounter < 10; warmbootFlag =1;		A						
	watchdogFlag = 0, patchValidFlag =1		A						
	Check swHousekeeping messages:								
	startingBepTickCounter < 10;		B						
	endingBepTickCounter=		B						
	=startingBepTickCounter+640								
4.9			2	0 indicates BEP A is selected		Y	1or2		
			2	1 means FIFO not full					
			2	1 means FIFO not empty					
4.10			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					
5.0									
5.1	Check cmdResult == OK		B	Load Fullhouse DEA housekeeping		Y	1or2		
	commandEcho 225			parameter block into slot 4					
5.2	Check cmdResult == OK		B	get FP temp from DEA HKP data		Y	1or2		
	commandEcho 18								
5.3	Check cmdResult == OK		B			Y	1or2		
	commandEcho 66								
5.4	deaHousekeepingData		A	after $\sim 1/2$ hr, should be convinced temp is		P	1or2		

Table 1: **Exit Full Bakeout and Return to Thermal Standby Mode (Page 3)**

Step #	Title (Revision 2.13_V2.0)	Time Req (m)	Command Description	Command Mnemonic	Telemetry Description	Telemetry Mnemonic	Expected Value	Units
	Total Time	978.4						

Table 2: (CONT) **Exit Full Bakeout and Return to Thermal Standby Mode (Page 3)**

Step #	Telemetry EGSE	Other Verifier	Crit	Description	Notes	RT Con	Tlm Fmt	Min Alt	SIM Pos
				dropping, objective is stabilization at -120 C		P	1or2		