2.10_V2.2 OPEN ACIS DOOR ON ORBIT
(in 4 shots, including full bakeout)

Last Revised: July 2,1999
Filename: open_door

BRIEF FUNCTIONAL DESCRIPTION:
The ACIS camera housing door is planned to opened once on orbit. The door will not be opened until the spacecraft environment has outgassed sufficiently so that only a small amount of contaminants will build up on the ACIS filter. The spacecraft outgassing and venting models are provided by Loraynne Ryan at TRW. The acceptable level of contamination is specified by the ACIS IPI team. Both the small and big vent valves must be opened before the door can be opened. The door mechanism uses the same paraffin actuators as the big vent valve mechanism. Extreme caution must be exercised with these actuators, from the ACIS Long Form Functional Test Procedure document:

> *Because the Optical Blocking Filters are fragile and cannot withstand much differential pressure, mechanism motions may only be initiated when the differential pressure is less than 1 torr. Be safe; check both transducers. The mechanisms are driven by Starsys hot wax actuators. Power is applied directly from the space craft bus to heat the wax and, therefore, the time for a given motion to complete is dependent upon the bus voltage. To avoid failure of an actuator due to overheating–which would occur if the completion-of-motion switches failed, for instance–we monitor the actuator temperature. If the actuator temperature exceeds 135C, a command to abort the motion should be sent. Recovery from such a condition is never routine; no further motions should be attempted without thorough analysis of the procedural failure. It is also imperative that the commanded actuator be allowed to cool below 50C before the opposing actuator is commanded, lest the afore-mentioned egregious situation occur. It is not an error to command a valve open which is already open, etc., since the PSMC logic will know from the motion switches that the mechanism is already in the commanded state and not (falsely) apply power to the actuator.*

The side A HW serial digitial TLM has an extra bit to monitor the status of the actuator. However, the logic which determines the value of this bit is sufficiently obtuse, that it is typically easier to use side B. The door typically took 3.5 minutes to open with a 28VDC bus voltage during ground testing; it will go faster with 32VDC on the bus. The peak temperature should be 100 ± 10 C; damage can occur if the temperature exceeds 135 C. An on-board regulator disconnects the voltage if the temperature reaches 130 C. Therefore, ground intervention to abort the actuator motion should not be necessary or even possible, but is maintained as a backup to this automatic cutoff. As the actuator warms above 70 C, it begins to move and the door closed bit should switch to zero. Once the motion is complete and the actuator starts to cool, the door open bit should switch to one. While in transition, both bits should be zero.

The door open actuator will be cycled four times nominally before the door is completely open. A library of SCSs will be pre-built by the FOT which will contain the necessary commands to operate the actuator with heating cycle durations ranging from 50 – 150 s in 5 s intervals and 150,200, 250, and 300s. Each SCS will contain the actuator heater on command, the appropriate time delay, the actuator heater off command, a 1 s delay, and another actuator off command . The FOT will also have the actuator heater off command queued up and ready to be sent as quickly as possible in case of an emergency. Each suceeding cycle keeps the actuator heater on for a longer time. The first cycle is intended to be long enough to just melt the wax and have the plunger of the actuator move a small amount. The second cycle is intended to melt the wax, trip the "closed" limit switch and rotate the shaft by a few degrees without beginning to open the door. The third cycle is intended to melt the wax, trip the limit switch, and rotate the shaft by enough that the door cracks open by ~ 28 degrees. The last cycle is intended to open the door fully, rotating the shaft the entire way and tripping the "open" limit switch. In the last cycle, it is expected that the actuator will automatically shut itself off after it has hit the "open" limit switch. During the execution of the procedure, the SOT will decide on the appropriate duration for the heating cycle and instruct the FOT to uplink the appropriate SCS.

After each one of these cycles, the desired motion may not be observed. If this is the case, a contingency procedure may be called for. The contingency procedures which have been prepared are to repeat the heating cycle with a different duration than one of the planned 4 heating cycles (all times will be available in 5s increments) and simply to turn off the heater (hopefully this is unnecessary). If after the third heating cycle, the door has not lifted off of the camera housing it may be decided to abort this procedure and to thermally cycle the camera housing.

The sequence of actions will be:

1. start a DEA HKP run if necessary
2. enable FP bakeout and start heating FP to +30 C
3. Enable and turn on the DA housing bakeout heater, heat DA housing to +25 C
   ——— In orbit, wait 8 hours for FP and DA to heat up ————-
4. switch spacecraft telemetry format to 4
5. enable the door mechanism side B and verify actuator temperatures
6. Execute first heating cycle
7. Verify expected behavior (the temperature and motion of the actuator)
8. Monitor actuator cooldow
9. Decide if next heating cycle time is correct, if yes proceed, if no execute contingency
10. Execute second heating cycle
11. Verify expected behavior
12. Monitor actuator cooldow
13. Decide if next heating cycle time is correct, if yes proceed, if no execute contingency
14. Execute third heating cycle
15. Verify expected behavior
16. Monitor actuator cooldow
17. Decide if next heating cycle time is correct, if yes proceed, if no execute contingency
18. Execute fourth heating cycle
19. Verify expected behavior
20. Monitor actuator cooldow
21. disable the door mechanism B
22. switch spacecraft telemetry format to 1 or 2
23. Turn off DA housing bakeout heater, cool DA to -60 C
24. gradually lower FP temperature to -40 C, keeping it above the DH temperature at all times
    ——— In orbit, wait 8 hours for FP and DA to cool down ————-
25. disable FP bakeout and reboot, lower FP temperature to -120 C

ASSUMED INSTRUMENT STATE:
Assumes the small and big vent valves have been open for many days.
Assumes that the instrument is in the canonical thermal standy state (the video boards and FEPs must be off !!!!).
Assumes the DA heater on side B is on.
Assumes that the RCTU starts in format 1 or 2, is swithced to format 4 for the door opening and is then put back into format 1 or 2.

SPECIAL INITIAL CONDITIONS:
Assumes the spacecraft environment has outgassed sufficiently to allow the door to be opened.

OPERATIONAL CONSTRAINTS/CAUTIONS:
The small and big vent valves must already be open.
The open and close mechanism must not be enabled at the same time.
CARD ACIS-002
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REFERENCES:
ACIS Long Form Functional Test Procedure (36-01301.01)
see associated contingency procedures

CHANGE HISTORY:

V1.2

- changed filenames from "open_door_4shots" to "open_door"

V1.3

- deleted commands in step 1 which verified that the Big Valve was indeed open
- put commands into a new step 1 to start a DEA HKP run if necessary
- inserted a command to set the warm boot flag off before the focal plane bakeout enable and inserted a dumpSysConfig command in step 2
- added the DA heater output voltage and current as verifiers in step 3.2
- added cold radiator temperature as verfifiers in step 3.3
- changed expected values of the actuator temperatures in step 5.2
- changed all of the 4 heating cycles to explictly state that the SOT selects a heating duration by calling out the name of a pre-built SCS and the FOT uplinks, enables and executes that SCS. This effects steps 6, 10, 14, and 18.
- deleted 1MAHOBT as verifier in steps 8, 12, 16, and 20
- updated heating durations and expected max temperatures to be consistent with Ed's preflight predictions
- changed step 17 to require that the shaft rotation angle must be large than 18 degrees to proceed
- deleted previous step 23 which maintained an elevated focal plane temperature for 2 hours after the door had opened
- changed Time Req for all of the substeps in step 24 to be 60 minutes
- changed the expected value of the HW serial digital verifiers 1MEOPBOP and 1MECLBCL to be "NOPE,OPEN" and "CLOS,NCLO" throughout the procedure instead of 1 or 0
- added value of commandEcho for all SW command packets
- edited Brief Functional Description to be consistent with procedure

V1.4

- changed HW TLM verifier in step 2.1 to 1DE28AVO
- changed expected value of DA Htr Current in step 3.2 to ~ 2 A
- changed criticality of 1MODRBOP in steps 6.4, 10.4, 14.4, and 18.4 to “2”
- changed titles of steps 25.1 and 25.2 to “remove FP bakeout enable” and “disable FP bakeout”

V2.0

- ACIS Team signed-off version, identical to previous version 1.4

V2.1

- changed expected value of “1STAT7ST” to “0” in step 25.7

V2.2

- moved commands to turn off the Housing Bakeout heater to step 22 before the TLM FMT switch to FMT 1or2

Table 1: **Open ACIS Door on Orbit**

Step #	Title (Revision 2.10_V2.2)	Time Req (m)	Command Description	Command Mnemonic	Telemetry Description	Telemetry Mnemonic	Expected Value	Units
1	Start DEA HK if necessary							
1.1	Load Board 11 DEA HK	1	loadDeaBlock	WD00001024				
1.2	Start DEA Hkp run	1	startDEA	XDZ0000005				
2	Start Heating FP to +30 C							
2.1	verify power consumption	2			DEA Input I	1DEICACU	0.62–0.75	A
					DEA Input V	1DE28AVO	28.0-34.0	V
2.2	Set warm boot flag off	1	DPA Cold Boot	1WRMBTSB(0)				
2.3	Upload bakeout patch	1	writeBep	WBBOEN_ENB				
2.4	Enable the FP BO htr	1	changeConfigSetting	WSBAKENABL				
2.5	Set FP temp to +30 C	1	changeConfigSetting	WSFTPOS_30				
2.6	dump system config.	0.1	dumpSysConfig	RS_0000001				
2.7	wait for FP temp	30					-60	C
					Cold Radiator T A	1CRAT	~ -90	C
					Cold Radiator T B	1CRBT	~ -90	C
3	Start heating DH to +25 C							
3.1	Housing Bakeout Enb B	1	Housing B.O. Ena B	1HBOBEN	DA BO B Enb/Dis	1DABOBEN	ENB	
3.2	Housing Bakeout On B	1	Housing B.O. On B	1HBOBON	DA BO B On/Off	1DABOBON	ON	
					DA Htr Output V B	1DAHBVO	28.0–34.0	V
					DA Htr Current B	1DAHBCU	~ 2.0	A
3.3	monitor DA housing temp	480			Camera Body T A	1CBAT	23	C
					Camera Body T B	1CBBT	23	C
4	Switch to tlm fmt 4							
4.1	Switch to tlm fmt 4	2						
5	Enable Door Mechanism							
5.1	Enable door mech. B	1	Door enable B	1MCMDBEN	Enable Side B	1MDBUBON	ENB	
5.2	Verify Actuator temps	10			Door Open Act. Tlow	1OAHAT	$\sim +10$	C

Table 2: (CONT) **Open ACIS Door on Orbit**

Step #	Telemetry EGSE	Other Verifier	Crit	Description	Notes	RT Con	Tlm Fmt	Min Alt	SIM Pos
1									
1.1	Check cmdResult == OK		B	Load Fullhouse DEA housekeeping			1or2		
	commandEcho 225			parameter block into slot 4					
1.2	deaHousekeepingData		B	get FP temp, should be < -90 C.			1or2		
	commandEcho 18								
2									
2.1			2	DEA A Power should be 21 ± 3 W,		Y	1or2		
				current is noisy so an avg. is needed		Y	2		
2.2				disable Warm boot if BEP watchdogs		Y	1or2		
2.3	Check cmdResult == OK		A	Enable the "enable"		Y	1or2		
	commandEcho 101								
2.4	Check cmdResult == OK		A	enable the FP bakeout heater	If *psci* indicates a	Y	1or2		
	commandEcho 114				SWSTAT_DEAMAN_BADCNTLREG				
2.5	Check cmdResult == OK		A	Set desired FP temp to +30 C,	or SWSTAT_DEABOARD_ERROR,	Y	1or2		
	commandEcho 159			FP bakeout htr comes on.	bakeout enabled failed.				
2.6	Check cmdResult == OK		B	get data to verify bakeout enable	run *psci -a -l* to examine	Y	1or2		
	commandEcho 66				SysConfig packets.				
2.7	deaHousekeepingData		A	Once FP exceeds -60 C, the DH	Time depends on starting T.	P	1or2		
			2	bakeout may begin. Cold radiator					
			2	temp will increase from -130 C.					
3									
3.1			2			Y	1or2		
3.2			2			Y	1or2		
			2						
			2						
3.3			2	wait for temp to rise to 23 C		P	1or2		
			2						
4									
4.1				Spacecraft command		Y	4		
5									
5.1			2	should be one == enabled		Y	4		
5.2			2			Y	4		

Table 1: **Open ACIS Door on Orbit (Page 2)**

Step #	Title (Revision 2.10_V2.2)	Time Req (m)	Command Description	Command Mnemonic	Telemetry Description	Telemetry Mnemonic	Expected Value	Units
					Door Open Act. T B	1MAHOBT	< 30	C
					Act. Housing T B	1OAHBT	$\sim +10$	C
					Door Close Act. T B	1MAHCBT	< 30	C
5.3	Verify Shaft rotation	1			Shaft Rotation	1DACTAT	0 ± 2	
5.4	Verify limit switches	1			Door Open B	1MEOPBOP	NOPE	
					Door Close B	1MECLBCL	CLOS	
6	First Heating Cycle							
6.1	SOT selects duration	2.0						
6.2	FOT uplinks SCS	2.0						
6.3	FOT enables SCS	2.0						
6.4	FOT executes SCS	2.0						
	Open door side B	1.9	Open Drive B On	1MODRBON	Open Drive On/Off	1MODRBOP	ON	
	Turn off open drive B		Door Open Off B	1MODRBOF	Door Open Drive B	1MODRBOP	OFF	
	Turn off open drive B		Door Open Off B	1MODRBOF	Door Open Drive B	1MODRBOP	OFF	
6.5	Turn off open drive B	1	Door Open Off B	1MODRBOF	Door Open Drive B	1MODRBOP	OFF	
7	Verify expected behavior							
7.1	Verify Actuator temps	10			Door Open Act. Tlow	1OAHAT	~ 64.0	C
7.2	Verify Shaft rotation	1			Shaft Rotation	1DACTAT	0 ± 2	
7.3	Verify limit switches	1			Door Open B	1MEOPBOP	NOPE	
					Door Close B	1MECLBCL	CLOS	
8	Monitor Actuator Cooldown							
8.1	Monitor actuator temp	45			Door Open Act. Tlow	1OAHAT	20 ± 5	C
9	Decision for next heating cycle							
9.1	Does previous cycle need repeating ?	2						
10	Second Heating Cycle							
10.1	SOT selects duration	2.0						
10.2	FOT uplinks SCS	2.0						
10.3	FOT enables SCS	2.0						
10.4	FOT executes SCS	2.0						
	Open door side B	2.1	Open Drive B On	1MODRBON	Open Drive On/Off	1MODRBOP	ON	

Table 2: (CONT) **Open ACIS Door on Orbit (Page 2)**

Step #	Telemetry EGSE	Other Verifier	Crit	Description	Notes	RT Con	Tlm Fmt	Min Alt	SIM Pos
			2				4		
			2				4		
			2				4		
5.3			2	should be zero !		Y	4		
5.4			2	should be one==not open		Y	4		
			2	should be zero==closed			4		
6									
6.1				SOT calls out duration and name of SCS	preflight expectation is 110 s	Y	4		
6.2				FOT uplinks specified SCS into appropriate slot		Y	4		
6.3				spacecraft command		Y	4		
6.4				spacecraft command, heating cycle starts		Y	4		
			2	heater on for 110s					
			2	Off command sent twice by SCS with 1s delay.					
			2						
6.5			2	FOT has command queued in scratchpad		Y	4		
				and ready to be sent immediately					
7									
7.1			2			Y	4		
7.2			2	should be zero !		Y	4		
7.3			2	should be one==not open		Y	4		
			2	should be zero==closed					
8									
8.1			2			Y	4		
9									
9.1				If yes go back to step #6,		Y	4		
				If no proceed to step #10					
10									
10.1				SOT calls out duration and name of SCS	preflight expectation is 125 s	Y	4		
10.2				FOT uplinks specified SCS into appropriate slot		Y	4		
10.3				spacecraft command		Y	4		
10.4				spacecraft command, heating cycle starts		Y	4		
			2	heater on for 125s					

Table 1: **Open ACIS Door on Orbit (Page 3)**

Step #	Title (Revision 2.10_V2.2)	Time Req (m)	Command Description	Command Mnemonic	Telemetry Description	Telemetry Mnemonic	Expected Value	Units
	Turn off open drive B		Door Open Off B	1MODRBOF	Door Open Drive B	1MODRBOP	OFF	
	Turn off open drive B		Door Open Off B	1MODRBOF	Door Open Drive B	1MODRBOP	OFF	
10.5	Turn off open drive B	1	Door Open Off B	1MODRBOF	Door Open Drive B	1MODRBOP	OFF	
11	Verify expected behavior							
11.1	Verify Actuator temps	10			Door Open Act. Tlow	1OAHAT	~ 72.0	C
11.2	Verify Shaft rotation	1			Shaft Rotation	1DACTAT	~ 4	
11.3	Verify limit switches	1			Door Open B	1MEOPBOP	NOPE	
					Door Close B	1MECLBCL	NCLO	
12	Monitor Actuator Cooldown							
12.1	Monitor actuator temp	45			Door Open Act. Tlow	1OAHAT	$+20 \pm 5$	C
13	Decision for next heating cycle							
13.1	Does previous cycle need repeating ?	2						
14	Third Heating Cycle							
14.1	SOT selects duration	2.0						
14.2	FOT uplinks SCS	2.0						
14.3	FOT enables SCS	2.0						
14.4	FOT executes SCS	2.0						
	Open door side B	2.3	Open Drive B On	1MODRBON	Open Drive On/Off	1MODRBOP	ON	
	Turn off open drive B		Door Open Off B	1MODRBOF	Door Open Drive B	1MODRBOP	OFF	
	Turn off open drive B		Door Open Off B	1MODRBOF	Door Open Drive B	1MODRBOP	OFF	
14.5	Turn off open drive B	1	Door Open Off B	1MODRBOF	Door Open Drive B	1MODRBOP	OFF	
15	Verify expected behavior							
15.1	Verify Actuator temps	10			Door Open Act. Tlow	1OAHAT	~ 76.0	C
15.2	Verify Shaft rotation	2			Shaft Rotation	1DACTAT	28 ± 10	
15.3	Verify limit switches	2			Door Open B	1MEOPBOP	NOPE	
					Door Close B	1MECLBCL	NCLO	
16	Monitor Actuator Cooldown							
16.1	Monitor actuator temp	30			Door Open Act. Tlow	1OAHAT	$+20 \pm 5$	C
17	Decision for next heating cycle							

Table 2: (CONT) **Open ACIS Door on Orbit (Page 3)**

Step #	Telemetry EGSE	Other Verifier	Crit	Description	Notes	RT Con	Tlm Fmt	Min Alt	SIM Pos
			2	Off command sent twice by SCS with 1s delay.					
			2						
10.5			2	FOT has command queued in scratchpad and ready to be sent immediately		Y	4		
11									
11.1			2			Y	4		
11.2			2	should be ~ 4 degrees		Y	4		
11.3			2	should be one==not open		Y	4		
			2	should be one==not closed					
12									
12.1			2			Y	4		
13									
13.1				If yes go back to step #10, If no proceed to step #14		Y	4		
14									
14.1				SOT calls out duration and name of SCS	preflight expectation is 140 s	Y	4		
14.2				FOT uplinks specified SCS into appropriate slot		Y	4		
14.3				spacecraft command		Y	4		
14.4				spacecraft command, heating cycle starts		Y	4		
			2	heater on for 140s					
			2	Off command sent twice by SCS with 1s delay.					
			2						
14.5			2	FOT has command queued in scratchpad and ready to be sent immediately		Y	4		
15									
15.1			2			Y	4		
15.2			2	should be 28 ± 10 degrees		Y	4		
15.3			2	should be one==not open		Y	4		
			1	should be one==not closed					
16									
16.1			2			Y	4		
17									

Table 1: **Open ACIS Door on Orbit (Page 4)**

Step #	Title (Revision 2.10_V2.2)	Time Req (m)	Command Description	Command Mnemonic	Telemetry Description	Telemetry Mnemonic	Expected Value	Units
17.1	Is the shaft rotation angle > 18 degrees ?	2						
18	Fourth Heating Cycle							
18.1	SOT selects duration	2.0						
18.2	FOT uplinks SCS	2.0						
18.3	FOT enables SCS	2.0						
18.4	FOT executes SCS	2.0						
	Open door side B	4.1	Open Drive B On	1MODRBON	Open Drive On/Off	1MODRBOP	ON	
	Turn off open drive B		Door Open Off B	1MODRBOF	Door Open Drive B	1MODRBOP	OFF	
	Turn off open drive B		Door Open Off B	1MODRBOF	Door Open Drive B	1MODRBOP	OFF	
18.5	Turn off open drive B	1	Door Open Off B	1MODRBOF	Door Open Drive B	1MODRBOP	OFF	
19	Verify expected behavior							
19.1	Verify Actuator temps	2			Door Open Act. B	1MAHOBT	~ 100.0	C
19.2	Verify Shaft rotation	2			Shaft Rotation	1DACTAT	70 ± 5	
19.3	Verify limit switches	2			Door Open B	1MEOPBOP	OPEN	
					Door Close B	1MECLBCL	NCLO	
20	Monitor Actuator Cooldown							
20.1	Monitor actuator temp	30			Door Open Act. T B	1MAHOBT	$+20 \pm 5$	C
21	Disable drive B							
21.1	Disable drive B	2	Door Disable B	1MCMDBDS	Door Enable B	1MDBUBON	OFF	
22	Cool DH to -60C							
22.1	Housing Bakeout Off B	2	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
22.2	Housing Bakeout Dis B	2	Housing B.O. Dis B	1HBOBDS	DA BO B Enb/Dis	1DABOBEN	DIS	
23	Switch to tlm fmt 1or2							
23.1	Switch to tlm fmt 1or2	2						
24	Monitor DA housing temp							
24.1	monitor DA housing temp	120			Camera Body T A	1CBAT	+10	C
					Camera Body T B	1CBBT	+10	C

Table 2: (CONT) **Open ACIS Door on Orbit (Page 4)**

Step #	Telemetry EGSE	Other Verifier	Crit	Description	Notes	RT Con	Tlm Fmt	Min Alt	SIM Pos
17.1				If no, **GO TO STEP 21, DISABLE THE ACTUATOR, AND EXIT THIS PROCEDURE !**		Y	4		
				If yes proceed to #18.					
18									
18.1				SOT calls out duration and name of SCS, expectation is 250 s		Y	4		
18.2				FOT uplinks specified SCS into appropriate slot		Y	4		
18.3				spacecraft command		Y	4		
18.4				spacecraft command, heating cycle starts		Y	4		
			2	heater on for 250s					
			2	off command sent twice					
			2	by SCS with 1s delay					
18.5			2	FOT has command queued in scratchpad		Y	4		
				and ready to be sent immediately					
19									
19.1			2			Y	4		
19.2			1	should be 70 ± 5 degrees		Y	4		
19.3			1	should be zero==open		Y	4		
			1	should be one==not closed			4		
20									
20.1			1			Y	4		
21									
21.1			2			Y	4		
22									
22.1						Y	1or2		
			1	voltage should drop to 0					
			1	current should drop to zero					
22.2						Y	1or2		
23									
23.1				Spacecraft command		Y	1or2		
24									
24.1			2	wait for temp to drop below +10C		P	1or2		
			2	before lowering FP temperature					

Table 1: **Open ACIS Door on Orbit (Page 5)**

Step #	Title (Revision 2.10_V2.2)	Time Req (m)	Command Description	Command Mnemonic	Telemetry Description	Telemetry Mnemonic	Expected Value	Units
25	Drop FP temp							
25.1	drop FP temp to +20 C	60	ChangeConfigSetting	WSFTPOS_20				
25.2	drop FP temp to +10 C	60	ChangeConfigSetting	WSFTPOS_10				
25.3	drop FP temp to +0 C	60	ChangeConfigSetting	WSFTPOS_00				
25.4	drop FP temp to -10 C	60	ChangeConfigSetting	WSFTNEG_10				
25.5	drop FP temp to -20 C	60	ChangeConfigSetting	WSFTNEG_20				
25.6	drop FP temp to -30 C	60	ChangeConfigSetting	WSFTNEG_30				
25.7	drop FP temp to -40 C	60	ChangeConfigSetting	WSFTNEG_40				
26	Disable FP bakeout							
26.1	remove FP bakeout enable	2	ChangeConfigSetting	WSBAKDSABL				
26.2	disable FP bakeout	2	writeBep	WBBOEN_DIS				
26.3	set warm boot flag on	2	DPA Warm Boot	1WRMBTSB(1)				
26.4	Halt BEP	2	DPA Command Reset	1RSETIRT(1)				
26.5	Restart BEP	2	DPA Command Reset	1RSETIRT(0)	bepStartMessage			
26.6	Check BEP A Boot	2.0						
26.7	Check HW LEDs	2.0			BEP Select	1STAT4ST	0	
					BEP FIFO Not Full	1STAT6ST	1	

Table 2: (CONT) **Open ACIS Door on Orbit (Page 5)**

Step #	Telemetry EGSE	Other Verifier	Crit	Description	Notes	RT Con	Tlm Fmt	Min Alt	SIM Pos
25									
25.1	Check cmdResult == OK		1	examine sci tlm, FP to +20 C		Y	1or2		
	commandEcho 225								
25.2	Check cmdResult == OK		1	examine sci tlm,FP to +10 C		Y	1or2		
	commandEcho 226								
25.3	Check cmdResult == OK		1	examine sci tlm,FP to 0 C		Y	1or2		
	commandEcho 228								
25.4	Check cmdResult == OK		1	examine sci tlm,FP to -10 C		Y	1or2		
	commandEcho 231								
25.5	Check cmdResult == OK		1	examine sci tlm,FP to -20 C		Y	1or2		
	commandEcho 232								
25.6	Check cmdResult == OK		1	examine sci tlm,FP to -30 C		Y	1or2		
	commandEcho 235								
25.7	Check cmdResult == OK		1	examine sci tlm,FP to -40 C		Y	1or2		
	commandEcho 237								
26									
26.1	Check cmdResult == OK		1			Y	1or2		
	commandEcho 116								
26.2	Check cmdResult == OK			examine sci tlm		Y	1or2		
	commandEcho 99								
26.3			2			Y	1or2		
26.4			2	1RSETIRT=1 holds board in reset		Y	1or2		
26.5			2	1RSETIRT=0 releases board		Y	1or2		
26.6	Check bepStartupMessage:		A			Y	1or2		
	bepTickCounter < 10; warmBoot Flag=1;		A						
	watchdogFlag = 0, patchValidFlag =1		A						
	Check swHousekeeping messages:								
	startingBepTickCounter < 10;		B						
	endingBepTickCounter=		B						
	=startingBepTickCounter+640								
26.7			2	0 indicates BEP A is selected		Y	1or2		
			2	1 means FIFO not full					

Table 1: **Open ACIS Door on Orbit (Page 6)**

Step #	Title (Revision 2.10_V2.2)	Time Req (m)	Command Description	Command Mnemonic	Telemetry Description	Telemetry Mnemonic	Expected Value	Units
					BEP FIFO Not Empty	1STAT7ST	0	
26.8	Check SW LEDs	2.0			BEP initialization	1STAT3ST	0	
					Watchdog boot	1STAT2ST	1	
					Science run status	1STAT1ST	1	
						1STAT0ST	0or1	
26.9	drop FP temp to -120 C	10	ChangeConfigSetting	WSFTNEG120				
26.10	dump system config.	2	dumpSysConfig	RS_0000001				
26.11	Load Board 11 DEA HK	1	loadDeaBlock	WD00001024				
26.12	Start DEA Hkp run	1	startDEA	XDZ0000005				
26.13	Record FP temp	360					-120	C
	Total Time	1719.5						

Table 2: (CONT) **Open ACIS Door on Orbit (Page 6)**

Step #	Telemetry EGSE	Other Verifier	Crit	Description	Notes	RT Con	Tlm Fmt	Min Alt	SIM Pos
			2	1 means FIFO empty					
26.8			1	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					
26.9	Check cmdResult == OK		1	examine sci tlm		Y	1or2		
	commandEcho 105								
26.10	Check cmdResult == OK		1			Y	1or2		
	commandEcho 66			parameter block into slot 4					
26.11	Check cmdResult == OK		B	Load Fullhouse DEA housekeeping		Y	1or2		
	commandEcho 225			parameter block into slot 4					
26.12	deaHousekeepingData		B	get FP temp, should be decreasing below -60 C		Y	1or 2		
	commandEcho 18								
26.13	deaHousekeepingData		1	FP temperature slowly approaches -120 C		P	1or2		