1.15_V2.0 OBF INTEGRITY TEST

Last Revised: June 27, 1999
Filename: obf_intg

BRIEF FUNCTIONAL DESCRIPTION:
There is an LED inside the ACIS camera housing which can be turned on to test the integrity of the optical blocking filter (OBF). The measurement will consist of taking bias data with the ACIS-I and ACIS-S arrays with the LED off and then with the LED on. If the filter is intact, there should only be a small increase in the average bias level (except around some of the edges of the filter).

The sequence of actions will be:

1. start DEA HKP if necessary
2. configure the instrument to collect imaging array data
3. execute the science run with the ACIS-I array, including a dump of the complete configuration information
4. configure the instrument to collect spectroscopy array data
5. execute the science run with the ACIS-S array, including a dump of the complete configuration information
6. turn the LED on
7. configure the instrument to collect imaging array data
8. execute the science run with the ACIS-I array, including a dump of the complete configuration information
9. configure the instrument to collect spectroscopy array data
10. execute the science run with the ACIS-S array, including a dump of the complete configuration information
11. turn off the LED
12. power off the video boards and FEPs if necessary

ASSUMED INSTRUMENT STATE:
On orbit, the focal plane temperature should be around -90 C.
Assumes that both DPAs and side A of the DEA are on and the flight SW is running.
Assumes the standard patches are loaded.
ACIS internal LED should be off.

SPECIAL INITIAL CONDITIONS:

OPERATIONAL CONSTRAINTS/CAUTIONS:
This procedure does not include a warm boot at the beginning in order to preserve the focal plane temperature setting. If a warm boot is needed, the atomic procedure should be executed, followed by the appropriate procedure to set the focal plane temperature.

REFERENCES:

CHANGE HISTORY:

V1.2

- changed filenames from "ccd_obf" to "obf_intg"

V1.3

- added HW TLM verifiers in step 1 to check the BEP A boot
- edited step 2 to include the configuration for data acquisition with imaging array
- edited step 3 to include all the dumps
- edited step 5 to execute the first ACIS-S science run and to include all the dumps
- edited step 6 to turn on the LED and configure for ACIS-I
- edited step 7 to execute the second ACIS-I science run and to include all the dumps
- edited step 8 to configure for ACIS-S
- edited step 9 to execute the second ACIS-S science run and to include all the dumps
- edited step 10 to turn off the LED
- added step 11 to return to the canonical thermal standby state

V1.4

- removed the warm boot which was in the old step 1
- changed the expected value of the DPA A & B and DEA A input voltage and changed the expected values of the DPA A & B and DEA A input currents in steps 2.1 and 12.4
- changed the PB mnemonics in steps 3.1, 5.1, 8.1, and 10.1
- changed the start science command to "XTZ0000005" in steps 3.2, 5.2, 8.2, and 10.2
- used command "WSPOW00000" in step 12.1 to power-down the video boards and FEPs

V2.0

- ACIS team signed-off version.
- fixed typo in "Sequence of Actions" and added that the LED should be off in "Assumed Instrument State"
- added comment in step 12.2 to verify that FEPs and video boards are off

Table 1: **OBF Integrity Measurement Procedure**

Step #	Title (Revision 1.15_V2.0)	Time Req (m)	Command Description	Command Mnemonic	Telemetry Description	Telemetry Mnemonic	Expected Value	Units
1	Start DEA HKP if necessary							
1.1	Load Board 11 DEA HKP	1	loadDeaBlock	WD00001024				
1.2	Start DEA Hkp run	1	startDEA	XDZ0000005				
2	Configure for Imaging							
2.1	Power up imaging video	1	changeConfigSetting	WSPOW0CF3F				
	boards & FEPs				DEA Input V A	1DE28AVO	28.0–34.0	V
					DEA Input I A	1DEICACU	1.2–1.5	A
					DPA Input V A	1DP28AVO	28.0-34.0	V
					DPA Input I A	1DPICACU	1.1–1.4	A
					DPA Input V B	1DP28BVO	28.0–34.0	V
					DPA Input I B	1DPICBCU	1.0–1.2	A
3	Collect ACIS-I biases							
3.1	Load parameter block	1	loadTeBlock	WT000C8014				
3.2	Start science	1	startScience	XTZ0000005				
3.3	dump default TE PBs	0.1	dumpParameterSlots	RT_0000001				
3.4	dump default CC PBs	0.1	dumpParameterSlots	RC_0000001				
3.5	dump default 2D PBs	0.1	dumpParameterSlots	R2_0000001				
3.6	dump default 1D PBs	0.1	dumpParameterSlots	R1_0000001				
3.7	dump default DeaHk PBs	0.1	dumpParameterSlots	RD_0000001				
3.8	dump system config.	0.1	dumpSysConfig	RS_0000001				
3.9	dump bad pixel list	0.5	dumpBadPixels	RP_0000001				

Table 2: (CONT) **OBF Integrity Measurement Procedure**

Step #	Telemetry EGSE	Other Verifier	Crit	Description	Notes	RT Con	Tlm Fmt	Min Alt	SIM Pos
1									
1.1	Check cmdResult == OK commandEcho 225		B	Load Fullhouse DEA housekeeping parameter block into slot 4		Y	1or2		
1.2	deaHousekeepingData commandEcho 18		B	get FP temp, should be stable and ± 2 C of desired value		Y	1or2		
2									
2.1	Check cmdResult == OK commandEcho 359		A 2 2 2 2 2 2	 Expect DEA side A $= 42 \pm 3$ W. Current is noisy, an avg. is needed. Expect DPA Side A $= 38 \pm 2$ W Expect DPA Side B$= 33 \pm 2$ W.		Y	2	60k	
3									
3.1	Check cmdResult == OK commandEcho 748		A	collect biases with ACIS-I		Y	2	60k	
3.2	Check cmdResult == OK commandEcho 58		A	run I0–I3,S2,S3		Y	2	60k	
3.3	Check cmdResult == OK commandEcho 78		B		*psci* should not indicate any errors regarding	Y	2	60k	
3.4	Check cmdResult == OK commandEcho 75		B		"truncated blocks" for any of these dumps.	Y	2	60k	
3.5	Check cmdResult == OK commandEcho 72		B			Y	2	60k	
3.6	Check cmdResult == OK commandEcho 71		B			Y	2	60k	
3.7	Check cmdResult == OK commandEcho 63		B			Y	2	60k	
3.8	Check cmdResult == OK commandEcho 66		B			Y	2	60k	
3.9	Check cmdResult == OK commandEcho 83		B			Y	2	60k	

Table 1: **OBF Integrity Measurement Procedure(Page 2)**

Step #	Title (Revision 1.15_V2.0)	Time Req (m)	Command Description	Command Mnemonic	Telemetry Description	Telemetry Mnemonic	Expected Value	Units
3.10	dump bad TE columns	0.1	dumpBadTeColumn	R4_0000001				
3.11	dump bad CC columns	0.1	dumpBadCcColumn	R3_0000001				
3.12	dump Huffman tables	0.5	dumpHuffman	RH_0000001				
3.13	dump patches	2	dumpPatchlist	RU_0000001				
3.14	Wait for data acquisition	30						
3.15	Stop Science	1	stopScience	AA00000000				
4	Configure for spectro							
4.1	Power up spectro video	1	changeConfigSetting	WSVIDSTD_S				
5	Collect ACIS-S biases							
5.1	Load parameter block	1	loadTeBlock	WT000CA014				
5.2	Start science	1	startScience	XTZ0000005				
5.3	dump default TE PBs	0.1	dumpParameterSlots	RT_0000001				
5.4	dump default CC PBs	0.1	dumpParameterSlots	RC_0000001				
5.5	dump default 2D PBs	0.1	dumpParameterSlots	R2_0000001				
5.6	dump default 1D PBs	0.1	dumpParameterSlots	R1_0000001				
5.7	dump default DeaHk PBs	0.1	dumpParameterSlots	RD_0000001				
5.8	dump system config.	0.1	dumpSysConfig	RS_0000001				
5.9	dump bad pixel list	0.5	dumpBadPixels	RP_0000001				

Table 2: (CONT) **OBF Integrity Measurement Procedure(Page 2)**

Step #	Telemetry EGSE	Other Verifier	Crit	Description	Notes	RT Con	Tlm Fmt	Min Alt	SIM Pos
3.10	Check cmdResult == OK commandEcho 80		B			Y	2	60k	
3.11	Check cmdResult == OK commandEcho 77		B			Y	2	60k	
3.12	Check cmdResult == OK commandEcho 68		B			Y	2	60k	
3.13	Check cmdResult == OK commandEcho 65		B			Y	2	60k	
3.14			A	get 10 exp. frames to get thrs. crsngs		Y	2	60k	
3.15	Check cmdResult == OK commandEcho 1539		A	scienceReport		Y	2	60k	
4									
4.1	Check cmdResult == OK commandEcho 92		A			Y	2	60k	
5									
5.1	Check cmdResult == OK commandEcho 751		A	collect biases with ACIS-S		Y	2	60k	
5.2	Check cmdResult == OK commandEcho 58		A	run S0-S5 CCDs		Y	2	60k	
5.3	Check cmdResult == OK commandEcho 78		B		*psci* should not indicate any errors regarding "truncated blocks" for any of these dumps.	Y	2	60k	
5.4	Check cmdResult == OK commandEcho 75		B			Y	2	60k	
5.5	Check cmdResult == OK commandEcho 72		B			Y	2	60k	
5.6	Check cmdResult == OK commandEcho 71		B			Y	2	60k	
5.7	Check cmdResult == OK commandEcho 63		B			Y	2	60k	
5.8	Check cmdResult == OK commandEcho 66		B			Y	2	60k	
5.9	Check cmdResult == OK		B			Y	2	60k	

Table 1: **OBF Integrity Measurement Procedure(Page 3)**

Step #	Title (Revision 1.15_V2.0)	Time Req (m)	Command Description	Command Mnemonic	Telemetry Description	Telemetry Mnemonic	Expected Value	Units
5.10	dump bad TE columns	0.1	dumpBadTeColumn	R4_0000001				
5.11	dump bad CC columns	0.1	dumpBadCcColumn	R3_0000001				
5.12	dump Huffman tables	0.5	dumpHuffman	RH_0000001				
5.13	dump patches	2	dumpPatchlist	RU_0000001				
5.14	Wait for data acquisition	30						
5.15	Stop Science	1	stopScience	AA00000000				
6	Configure for LED on							
6.1	enable LED	1.5	changeConfigSetting	WSLEDON				
7	Configure for Imaging							
7.1	Power up imaging video	1	changeConfigSetting	WSVIDSTD_I				
8	Collect ACIS-I biases with LED on							
8.1	Load parameter block	1	loadTeBlock	WT000C8014				
8.2	Start science	1	startScience	XTZ0000005				
8.3	dump default TE PBs	0.1	dumpParameterSlots	RT_0000001				
8.4	dump default CC PBs	0.1	dumpParameterSlots	RC_0000001				
8.5	dump default 2D PBs	0.1	dumpParameterSlots	R2_0000001				
8.6	dump default 1D PBs	0.1	dumpParameterSlots	R1_0000001				
8.7	dump default DeaHk PBs	0.1	dumpParameterSlots	RD_0000001				

Table 2: (CONT) **OBF Integrity Measurement Procedure(Page 3)**

Step #	Telemetry EGSE	Other Verifier	Crit	Description	Notes	RT Con	Tlm Fmt	Min Alt	SIM Pos
	commandEcho 83								
5.10	Check cmdResult == OK		B			Y	2	60k	
	commandEcho 80								
5.11	Check cmdResult == OK		B			Y	2	60k	
	commandEcho 77								
5.12	Check cmdResult == OK		B			Y	2	60k	
	commandEcho 68								
5.13	Check cmdResult == OK		B			Y	2	60k	
	commandEcho 65								
5.14			A	get 10 exp. frames to get thrs. crsngs		Y	2	60k	
5.15	Check cmdResult == OK		A	scienceReport		Y	2	60k	
	commandEcho 1539								
6									
6.1	Check cmdResult == OK					Y	2	60k	
	commandEcho 132								
7									
7.1	Check cmdResult == OK		A			Y	2	60k	
	commandEcho 90								
8									
8.1	Check cmdResult == OK		A	collect biases with ACIS-I		Y	2	60k	
	commandEcho 748								
8.2	Check cmdResult == OK		A	run I0–I3,S2,S3		Y	2	60k	
	commandEcho 58								
8.3	Check cmdResult == OK		B		*psci* should not indicate	Y	2	60k	
	commandEcho 78				any errors regarding				
8.4	Check cmdResult == OK		B		"truncated blocks" for	Y	2	60k	
	commandEcho 75				any of these dumps.				
8.5	Check cmdResult == OK		B			Y	2	60k	
	commandEcho 72								
8.6	Check cmdResult == OK		B			Y	2	60k	
	commandEcho 71								
8.7	Check cmdResult == OK		B			Y	2	60k	

Table 1: **OBF Integrity Measurement Procedure(Page 4)**

Step #	Title (Revision 1.15_V2.0)	Time Req (m)	Command Description	Command Mnemonic	Telemetry Description	Telemetry Mnemonic	Expected Value	Units
8.8	dump system config.	0.1	dumpSysConfig	RS_0000001				
8.9	dump bad pixel list	0.5	dumpBadPixels	RP_0000001				
8.10	dump bad TE columns	0.1	dumpBadTeColumn	R4_0000001				
8.11	dump bad CC columns	0.1	dumpBadCcColumn	R3_0000001				
8.12	dump Huffman tables	0.5	dumpHuffman	RH_0000001				
8.13	dump patches	2	dumpPatchlist	RU_0000001				
8.14	Wait for data acquisition	30						
8.15	Stop Science	1	stopScience	AA00000000				
9	Configure for Spectroscopy							
9.1	Power up spectro video	1	changeConfigSetting	WSVIDSTD_S				
10	Collect ACIS-S biases with LED on							
10.1	Load parameter block	1	loadTeBlock	WT000CA014				
10.2	Start science	1	startScience	XTZ0000005				
10.3	dump default TE PBs	0.1	dumpParameterSlots	RT_0000001				
10.4	dump default CC PBs	0.1	dumpParameterSlots	RC_0000001				
10.5	dump default 2D PBs	0.1	dumpParameterSlots	R2_0000001				
10.6	dump default 1D PBs	0.1	dumpParameterSlots	R1_0000001				

Table 2: (CONT) **OBF Integrity Measurement Procedure(Page 4)**

Step #	Telemetry EGSE	Other Verifier	Crit	Description	Notes	RT Con	Tlm Fmt	Min Alt	SIM Pos
	commandEcho 63								
8.8	Check cmdResult == OK		B			Y	2	60k	
	commandEcho 66								
8.9	Check cmdResult == OK		B			Y	2	60k	
	commandEcho 83								
8.10	Check cmdResult == OK		B			Y	2	60k	
	commandEcho 80								
8.11	Check cmdResult == OK		B			Y	2	60k	
	commandEcho 77								
8.12	Check cmdResult == OK		B			Y	2	60k	
	commandEcho 68								
8.13	Check cmdResult == OK		B			Y	2	60k	
	commandEcho 65								
8.14			A	get 10 exp. frames to get thrs. crsngs		Y	2	60k	
8.15	Check cmdResult == OK		A	scienceReport		Y	2	60k	
	commandEcho 1539								
9									
9.1	Check cmdResult == OK					Y	2	60k	
	commandEcho 92								
10									
10.1	Check cmdResult == OK		A	collect biases with ACIS-S		Y	2	60k	
	commandEcho 751								
10.2	Check cmdResult == OK		A	run S0-S5 CCDs		Y	2	60k	
	commandEcho 58								
10.3	Check cmdResult == OK		B		*psci* should not indicate	Y	2	60k	
	commandEcho 78				any errors regarding				
10.4	Check cmdResult == OK		B		"truncated blocks" for	Y	2	60k	
	commandEcho 75				any of these dumps.				
10.5	Check cmdResult == OK		B			Y	2	60k	
	commandEcho 72								
10.6	Check cmdResult == OK		B			Y	2	60k	
	commandEcho 71								

Table 1: **OBF Integrity Measurement Procedure(Page 5)**

Step #	Title (Revision 1.15_V2.0)	Time Req (m)	Command Description	Command Mnemonic	Telemetry Description	Telemetry Mnemonic	Expected Value	Units
10.7	dump default DeaHk PBs	0.1	dumpParameterSlots	RD_0000001				
10.8	dump system config.	0.1	dumpSysConfig	RS_0000001				
10.9	dump bad pixel list	0.5	dumpBadPixels	RP_0000001				
10.10	dump bad TE columns	0.1	dumpBadTeColumn	R4_0000001				
10.11	dump bad CC columns	0.1	dumpBadCcColumn	R3_0000001				
10.12	dump Huffman tables	0.5	dumpHuffman	RH_0000001				
10.13	dump patches	2	dumpPatchlist	RU_0000001				
10.14	Wait for data acquisition	30						
10.15	Stop Science	1	stopScience	AA00000000				
11	Turn LED off							
11.1	disable LED	1	changeConfigSetting	WSLEDOFF				
12.0	Power down VDs and FEPs							
12.1	Power down video boards & FEPs	2	changeConfigSetting	WSPOW00000				
12.2	dump system config.	0.1	dumpSysConfig	RS_0000001				
12.3	Check DPA and DEA pwr				DPA Input V A	1DP28AVO	28.0–34.0	V
					DPA Input I A	1DPICACU	0.35–0.43	A
					DPA Input V B	1DP28BVO	28.0–34.0	V
					DPA Input I B	1DPICBCU	0.26–0.32	A
					DEA Input I A	1DEICACU	0.62–0.75	A
					DEA Input V A	1DEP3AVO	28.0-34.0	V
	Total Time	157.8						

Table 2: (CONT) **OBF Integrity Measurement Procedure(Page 5)**

Step #	Telemetry EGSE	Other Verifier	Crit	Description	Notes	RT Con	Tlm Fmt	Min Alt	SIM Pos
10.7	Check cmdResult == OK commandEcho 63		B			Y	2	60k	
10.8	Check cmdResult == OK commandEcho 66		B			Y	2	60k	
10.9	Check cmdResult == OK commandEcho 83		B			Y	2	60k	
10.10	Check cmdResult == OK commandEcho 80		B			Y	2	60k	
10.11	Check cmdResult == OK commandEcho 77		B			Y	2	60k	
10.12	Check cmdResult == OK commandEcho 68		B			Y	2	60k	
10.13	Check cmdResult == OK commandEcho 65		B			Y	2	60k	
10.14			A	get 10 exp. frames to get thrs. crsngs		Y	2	60k	
10.15	Check cmdResult == OK commandEcho 1539		A	scienceReport		Y	2	60k	
11									
11.1	Check cmdResult == OK commandEcho 135		A	check swHousekeeping that LED is off		Y	2	60k	
12.0									
12.1	Check cmdResult == OK commandEcho 773		A	 return to thermal standby state		Y	2	60k	
12.2	Check cmdResult == OK commandEcho 66		B	verify FEPs and video boards off.		Y	1or2		
12.3			2 2 2 2 2	Expect 12 W for side A, power consumption should be more stable than I or V. Expect 9 W for side B, power consumption should be more stable than I or V. DEA A Power should be 21 ± 3 W, current is noisy, so an average is needed		Y	1or2		