5.14_V2.2 DEA and FEP Diagnostic Procedure

Last Revised: December 7, 2015
Filename: dea_fep_diags

BRIEF FUNCTIONAL DESCRIPTION:

This procedure obtains diagnostic information from the FEPs and video boards for use in analysis of the so-called HiLo Anomaly, (in which one CCD stops reporting events and the overclock values suggest the bias on 3 of its quads is zero and on the other is 4095), or whenever an anomaly is suspected in an ACIS FEP or video board while realtime telemetry is being received and there is sufficient time available to uplink and run this diagnostic procedure before the end of the science run.

The FOT should group the ACIS commands into three CLDs.

The first CLD, containing steps 2 and 3, contains commands that are the same regardles of which FEP/video board combination has experienced the anomaly.

The second CLD, containing step 4, contains commands that are specific to the video board that experienced the anomaly. Ten such CLDs will be generated and the ACIS Ops Scientist must select the appropriate CLD file in the CAP for the video board to be tested.

The third CLD, containing steps 5 and 6, contains commands that are specific to the FEP that experienced the anomaly. Six such CLDs will be generated and the ACIS Ops Scientist must select the appropriate CLD file in the CAP for the FEP to be tested.

The CLDs should be loaded into three SCS slots: the first CLD should end by calling the SCS slot containing the second CLD, and the second CLD should end by calling the SCS slot that contains the third CLD.

The sequence of actions will be:

- Select a short or long delay time based on the degree of telemetry saturation. Unless the realtime telemetry shows that a substantial number of exposures are being skipped, the short delay time should be chosen.
- Select one CCD and one FEP for diagnostics.
- Load the three CLDs into three SCS slots.
- Start the first CLD. The following actions will occur automatically so that they will not be affected by a loss-of-contact.
- Suspend the FEPs and wait for the telemetry buffer to empty.
- Turn off DEA housekeeping
- Prepare for diagnostics by saving the current video board configuration and powering up all video boards.
- Perform DEA diagnostics for the selected CCD chip. When complete, power off video boards not needed for the current science run.
- Perform FEP diagnostics for the selected FEP.
- Restart DEA housekeeping and resume FEP processing.
- Resume the science run in process.

- If still in comm when the diagnostic ends, ACIS Ops should verify that all FEPS (except the one being diagnosed) are reporting data as usual.

Note this SOP halts the DEA sequencer for the video board in question and does not restart it. Therefore, that CCD/video board combination will produce no data for the rest of the current science run.

When the video boards are all powered on but not sequencing, the −15 v DEA-A power supply voltage (1DEN1AVO) will read −16.7 v. The current yellow limit is −16.5 v.

After FEPS resume processing, ACIS Ops should verify if possible that all but the problem FEP are reporting events, threshold crossings are nominal, etc. PMON will show a red error message FEPREC_RESET, with count=1 and value=fepId for the dumped FEP.

The Hi-Lo Pixel anomaly is documented in detail in Peter Ford's memo of Dec 3, 2014, entitled "The ACIs Hi-Lo-Pixel Anomaly (v1.4)". Commands are detailed in a spreadsheet, *"hilo_diags_plan v2.2.xlsx"*, which is available under MIT ACIS CVS control at *"patches/deadump"*.

ACIS flight software personnel will review the contents of the various dumps after the procedure has been run.

ASSUMED INSTRUMENT STATE:

An anomaly, such as the ACIS HiLo Anomaly, which leaves a science run active, is observed to be in progress. For testing purposes, this procedure may be run without an anomaly.

SPECIAL INITIAL CONDITIONS:

Spacecraft telemetry should be in Format 2

OPERATIONAL CONSTRAINTS/CAUTIONS:

If SCS 107 runs during this procedure, there is a chance the FEP being interrogated will crash. Since science operations stop at that point anyway, and normal return to science activities will reboot the FEP, no action is required. The diagnostic dump data may be lost depending on the timing. There is no health or safety issue.

NOTES:

The commands in step 4.1a–j, one for each CCD/Video board combination, have names that follow no clear convention. This is for historical reasons. In order by ccdid, these are: XB1SLOMOI0, XB1SLOMOI1, XB1SLOMOI2, XB1SLOMOI3, XB1SLOMO02 (not a typo), XB1SLOMOS1, XB1SLOMOS2, XBS3_BDCST, XBS4_BDCST, and XBS5_BDCST.

REFERENCES:

1. Peter G. Ford memo, Dec 3, 2014, "The ACIS Hi-Lo Pixel Anomaly (v1.4)"
2. Spreadsheet *"hilo_diags_plan v2.2.xlsx"* under MIT ACIS CVS control at *"patches/deadump"*.

CHANGE HISTORY:

V0.1

- Initial version, based on memos referenced above.

V0.2

- Bug fixes, per Royce's comments

V0.3

- Bug fixes, per Peter's comments

V0.4

- Bug fixes, per Royce's comments

V1.0

- Minor edits, ready for FOT release.

V2.0

- Sent to FOT.

V2.1

- Text revisions, per Paul's comments.

V2.2

- Text revisions, after first execution of procedure.
- Table revisions, to add expected sizes of dumped data.

Table 1: **DEA FEP Diagnostics SOT SOP(Page 1)**

Step #	**Title (Revision 5.14_V2.2)**	**Time Req**	**Command Description**	**Command Mnemonic**	**Cmd EGSE**	**Seq Key**	**Telemetry Description**	**Telemetry Mnemonic**
1.0	Choose delay, FEP, CCD							
2.0	Based on choice of short or long delay		Execute either 2.1a or 2.1b below					
2.1a	Suspend FEPs/Short Delay	6	Follow with wait of 360 sec	XBFEP_SUSP				
2.1b	Suspend FEPs/Long Delay	60	Follow with wait of 3600 sec	XBFEP_SUSP				
3.0	Prepare for DEA Diagnostics							
3.1	Turn off DEA housekeeping		Turn off DEA housekeeping	AD_0000001				
3.2	Save DEA power mask		getSetting	XBSVDEAMSK				
3.3	Power up all DEA boards		Power up all DEA boards	WSVIDALLUP				
3.4	Dump active DEA housekeeping	2.5	dumpDeaHouse	XBDEAHKDMP				
3.5	Save DEA broadcast mask		Save DEA broadcast mask	XBBCMSK_SV				
3.6	Clear DEA broadcast mask		Clear DEA broadcast mask	XBDEAHK_DS				
4.0	Perform DEA diagnostics for selected chip.		Execute one of the subsequences below (4.*a through 4.*j)					
4.1a	Set CCD I0 in broadcast mask		deaManager.enable	XB1SLOMOI0				
4.2a	Stop selected DEA sequencer		deaManager.stopSequencer	XBDEASQ_DN				
4.3a	Restore original broadcast mask		mongooseCopyWords	XBBCMSK_RS				
4.4a	Dump CCD I0 SRAM	0.5	readSram command	RZ_FULL_I0				
4.5a	Dump CCD I0 PRAM	0.5	readPram command	RY_FULL_I0				

Table 1: **DEA FEP Diagnostics SOT SOP(Page 1)**

Step #	Expected Value	Units	Telemetry EGSE	Other Verifier	Crit	Comments	Notes	RT Con	Tlm Fmt	Min Alt	SIM Pos
1.0											
2.0						Execute either 2.1a or 2.1b below					
2.1a			Check CmdResult == OK commandEcho == 13940		2	Follow with wait of 360 sec		Y	2		
2.1b			Check CmdResult == OK commandEcho == 13940		2	Follow with wait of 3600 sec		Y	2		
3.0											
3.1			Check cmdResult == OK commandEcho == 60		2	stopDea command					
3.2			Check cmdResult == OK commandEcho == 13943		2						
3.3			Check cmdResult == OK commandEcho == 768		2						
3.4			Check cmdResult == OK commandEcho == 14247		2						
3.5			Check cmdResult == OK commandEcho == 14248		2						
3.6			Check cmdResult == OK commandEcho == 14127		2						
4.0						Execute one of the subsequences below (4.*a through 4.*j)					
4.1a			Check cmdResult == OK commandEcho == 2978		2						
4.2a			Check cmdResult == OK commandEcho == 13968		2						
4.3a			Check cmdResult == OK commandEcho == 14256		2						
4.4a			Check cmdResult == OK commandEcho == 3238		2	sramReadReply.1.dat	65536 bytes				
4.5a			Check cmdResult == OK commandEcho == 3237		2	pramReadReply.1.dat	65536 bytes				

Table 1: **DEA FEP Diagnostics SOT SOP(Page 2)**

Step #	Title (Revision 5.14_V2.2)	Time Req	Command Description	Command Mnemonic	Cmd EGSE	Seq Key	Telemetry Description	Telemetry Mnemonic
4.6a	Load utility routine into I-Cache		writeBep command	WBHILO_UTI				
4.7a	Power down unused DEA boards		sysConfigTablechangeEntry	XBHILO_UTI				
4.1b	Set CCD I1 in broadcast mask		deaManager.enable	XB1SLOMOI1				
4.2b	Stop selected DEA sequencer		deaManager.stopSequencer	XBDEASQ_DN				
4.3b	Restore original broadcast mask		mongooseCopyWords	XBBCMSK_RS				
4.4b	Dump CCD I1 SRAM	0.5	readSram command	RZ_FULL_I1				
4.5b	Dump CCD I1 PRAM	0.5	readPram command	RY_FULL_I1				
4.6b	Load utility routine into I-Cache		writeBep command	WBHILO_UTI				
4.7b	Power down unused DEA boards		sysConfigTablechangeEntry	XBHILO_UTI				
4.1c	Set CCD I2 in broadcast mask		deaManager.enable	XB1SLOMOI2				
4.2c	Stop selected DEA sequencer		deaManager.stopSequencer	XBDEASQ_DN				
4.3c	Restore original broadcast mask		mongooseCopyWords	XBBCMSK_RS				
4.4c	Dump CCD I2 SRAM	0.5	readSram command	RZ_FULL_I2				
4.5c	Dump CCD I2 PRAM	0.5	readPram command	RY_FULL_I2				
4.6c	Load utility routine into I-Cache		writeBep command	WBHILO_UTI				
4.7c	Power down unused DEA boards		sysConfigTablechangeEntry	XBHILO_UTI				

Table 1: **DEA FEP Diagnostics SOT SOP(Page 2)**

Step #	**Expected Value**	**Units**	**Telemetry EGSE**	**Other Verifier**	**Crit**	**Comments**	**Notes**	**RT Con**	**Tlm Fmt**	**Min Alt**	**SIM Pos**
4.6a			Check cmdResult == OK commandEcho == 14122		2						
4.7a			Check cmdResult == OK commandEcho == 14124		2						
4.1b			Check cmdResult == OK commandEcho == 3699		2						
4.2b			Check cmdResult == OK commandEcho == 13968		2						
4.3b			Check cmdResult == OK commandEcho == 14256		2						
4.4b			Check cmdResult == OK commandEcho == 3242		2	sramReadReply.1.dat	65536 bytes				
4.5b			Check cmdResult == OK commandEcho == 3241		2	pramReadReply.1.dat	65536 bytes				
4.6b			Check cmdResult == OK commandEcho == 14122		2						
4.7b			Check cmdResult == OK commandEcho == 14124		2						
4.1c			Check cmdResult == OK commandEcho == 3130		2						
4.2c			Check cmdResult == OK commandEcho == 13968		2						
4.3c			Check cmdResult == OK commandEcho == 14256		2						
4.4c			Check cmdResult == OK commandEcho == 3247		2	sramReadReply.1.dat	65536 bytes				
4.5c			Check cmdResult == OK commandEcho == 3244		2	pramReadReply.1.dat	65536 bytes				
4.6c			Check cmdResult == OK commandEcho == 14122		2						
4.7c			Check cmdResult == OK commandEcho == 14124		2						

Table 1: **DEA FEP Diagnostics SOT SOP(Page 3)**

Step #	**Title (Revision 5.14_V2.2)**	**Time Req**	**Command Description**	**Command Mnemonic**	**Cmd EGSE**	**Seq Key**	**Telemetry Description**	**Telemetry Mnemonic**
4.1d	Set CCD I3 in broadcast mask		deaManager.enable	XB1SLOMOI3				
4.2d	Stop selected DEA sequencer		deaManager.stopSequencer	XBDEASQ_DN				
4.3d	Restore original broadcast mask		mongooseCopyWords	XBBCMSK_RS				
4.4d	Dump CCD I3 SRAM	0.5	readSram command	RZ_FULL_I3				
4.5d	Dump CCD I3 PRAM	0.5	readPram command	RY_FULL_I3				
4.6d	Load utility routine into I-Cache		writeBep command	WBHILO_UTI				
4.7d	Power down unused DEA boards		sysConfigTablechangeEntry	XBHILO_UTI				
4.1e	Set CCD S0 in broadcast mask		deaManager.enable	XB1SLOMO02				
4.2e	Stop selected DEA sequencer		deaManager.stopSequencer	XBDEASQ_DN				
4.3e	Restore original broadcast mask		mongooseCopyWords	XBBCMSK_RS				
4.4e	Dump CCD S0 SRAM	0.5	readSram command	RZ_FULL_S0				
4.5e	Dump CCD S0 PRAM	0.5	readPram command	RY_FULL_S0				
4.6e	Load utility routine into I-Cache		writeBep command	WBHILO_UTI				
4.7e	Power down unused DEA boards		sysConfigTablechangeEntry	XBHILO_UTI				
4.1f	Set CCD S1 in broadcast mask		deaManager.enable	XB1SLOMOS1				
4.2f	Stop selected DEA sequencer		deaManager.stopSequencer	XBDEASQ_DN				

Table 1: **DEA FEP Diagnostics SOT SOP(Page 3)**

Step #	Expected Value	Units	Telemetry EGSE	Other Verifier	Crit	Comments	Notes	RT Con	Tlm Fmt	Min Alt	SIM Pos
4.1d			Check cmdResult == OK commandEcho == 3660		2						
4.2d			Check cmdResult == OK commandEcho == 13968		2						
4.3d			Check cmdResult == OK commandEcho == 14256		2						
4.4d			Check cmdResult == OK commandEcho == 3250		2	sramReadReply.1.dat	65536 bytes				
4.5d			Check cmdResult == OK commandEcho == 3249		2	pramReadReply.1.dat	65536 bytes				
4.6d			Check cmdResult == OK commandEcho == 14122		2						
4.7d			Check cmdResult == OK commandEcho == 14124		2						
4.1e			Check cmdResult == OK commandEcho == 2166		2						
4.2e			Check cmdResult == OK commandEcho == 13968		2						
4.3e			Check cmdResult == OK commandEcho == 14256		2						
4.4e			Check cmdResult == OK commandEcho == 1602		2	sramReadReply.1.dat	65536 bytes				
4.5e			Check cmdResult == OK commandEcho == 1613		2	pramReadReply.1.dat	65536 bytes				
4.6e			Check cmdResult == OK commandEcho == 14122		2						
4.7e			Check cmdResult == OK commandEcho == 14124		2						
4.1f			Check cmdResult == OK commandEcho == 3191		2						
4.2f			Check cmdResult == OK commandEcho == 13968		2						

Table 1: **DEA FEP Diagnostics SOT SOP(Page 4)**

Step #	Title (Revision 5.14_V2.2)	Time Req	Command Description	Command Mnemonic	Cmd EGSE	Seq Key	Telemetry Description	Telemetry Mnemonic
4.3f	Restore original broadcast mask		mongooseCopyWords	XBBCMSK_RS				
4.4f	Dump CCD S1 SRAM	0.5	readSram command	RZ_FULL_S1				
4.5f	Dump CCD S1 PRAM	0.5	readPram command	RY_FULL_S1				
4.6f	Load utility routine into I-Cache		writeBep command	WBHILO_UTI				
4.7f	Power down unused DEA boards		sysConfigTablechangeEntry	XBHILO_UTI				
4.1g	Set CCD S2 in broadcast mask		deaManager.enable	XB1SLOMOS2				
4.2g	Stop selected DEA sequencer		deaManager.stopSequencer	XBDEASQ_DN				
4.3g	Restore original broadcast mask		mongooseCopyWords	XBBCMSK_RS				
4.4g	Dump CCD S2 SRAM	0.5	readSram command	RZ_FULL_S2				
4.5g	Dump CCD S2 PRAM	0.5	readPram command	RY_FULL_S2				
4.6g	Load utility routine into I-Cache		writeBep command	WBHILO_UTI				
4.7g	Power down unused DEA boards		sysConfigTablechangeEntry	XBHILO_UTI				
4.1h	Set CCD S3 in broadcast mask		deaManager.enable	XBS3_BDCST				
4.2h	Stop selected DEA sequencer		deaManager.stopSequencer	XBDEASQ_DN				
4.3h	Restore original broadcast mask		mongooseCopyWords	XBBCMSK_RS				
4.4h	Dump CCD S3 SRAM	0.5	readSram command	RZ_FULL_S3				

Table 1: **DEA FEP Diagnostics SOT SOP(Page 4)**

Step #	Expected Value	Units	Telemetry EGSE	Other Verifier	Crit	Comments	Notes	RT Con	Tlm Fmt	Min Alt	SIM Pos
4.3f			Check cmdResult == OK commandEcho == 14256		2						
4.4f			Check cmdResult == OK commandEcho == 1601		2	sramReadReply.1.dat	65536 bytes				
4.5f			Check cmdResult == OK commandEcho == 1611		2	pramReadReply.1.dat	65536 bytes				
4.6f			Check cmdResult == OK commandEcho == 14122		2						
4.7f			Check cmdResult == OK commandEcho == 14124		2						
4.1g			Check cmdResult == OK commandEcho == 3129		2						
4.2g			Check cmdResult == OK commandEcho == 13968		2						
4.3g			Check cmdResult == OK commandEcho == 14256		2						
4.4g			Check cmdResult == OK commandEcho == 3235		2	sramReadReply.1.dat	65536 bytes				
4.5g			Check cmdResult == OK commandEcho == 3232		2	pramReadReply.1.dat	65536 bytes				
4.6g			Check cmdResult == OK commandEcho == 14122		2						
4.7g			Check cmdResult == OK commandEcho == 14124		2						
4.1h			Check cmdResult == OK commandEcho == 14251		2						
4.2h			Check cmdResult == OK commandEcho == 13968		2						
4.3h			Check cmdResult == OK commandEcho == 14256		2						
4.4h			Check cmdResult == OK commandEcho == 1599		2	sramReadReply.1.dat	65536 bytes				

Table 1: **DEA FEP Diagnostics SOT SOP(Page 5)**

Step #	Title (Revision 5.14_V2.2)	Time Req	Command Description	Command Mnemonic	Cmd EGSE	Seq Key	Telemetry Description	Telemetry Mnemonic
4.5h	Dump CCD S3 PRAM	0.5	readPram command	RY_FULL_S3				
4.6h	Load utility routine into I-Cache		writeBep command	WBHILO_UTI				
4.7h	Power down unused DEA boards		sysConfigTablechangeEntry	XBHILO_UTI				
4.1i	Set CCD S4 in broadcast mask		deaManager.enable	XBS4_BDCST				
4.2i	Stop selected DEA sequencer		deaManager.stopSequencer	XBDEASQ_DN				
4.3i	Restore original broadcast mask		mongooseCopyWords	XBBCMSK_RS				
4.4i	Dump CCD S4 SRAM	0.5	readSram command	RZ_FULL_S4				
4.5i	Dump CCD S4 PRAM	0.5	readPram command	RY_FULL_S4				
4.6i	Load utility routine into I-Cache		writeBep command	WBHILO_UTI				
4.7i	Power down unused DEA boards		sysConfigTablechangeEntry	XBHILO_UTI				
4.1j	Set CCD S5 in broadcast mask		deaManager.enable	XBS5_BDCST				
4.2j	Stop selected DEA sequencer		deaManager.stopSequencer	XBDEASQ_DN				
4.3j	Restore original broadcast mask		mongooseCopyWords	XBBCMSK_RS				
4.4j	Dump CCD S5 SRAM	0.5	readSram command	RZ_FULL_S5				
4.5j	Dump CCD S5 PRAM	0.5	readPram command	RY_FULL_S5				
4.6j	Load utility routine into I-Cache		writeBep command	WBHILO_UTI				

Table 1: **DEA FEP Diagnostics SOT SOP(Page 5)**

Step #	Expected Value	Units	Telemetry EGSE	Other Verifier	Crit	Comments	Notes	RT Con	Tlm Fmt	Min Alt	SIM Pos
4.5h			Check cmdResult == OK commandEcho == 1608		2	pramReadReply.1.dat	65536 bytes				
4.6h			Check cmdResult == OK commandEcho == 14122		2						
4.7h			Check cmdResult == OK commandEcho == 14124		2						
4.1i			Check cmdResult == OK commandEcho == 14253		2						
4.2i			Check cmdResult == OK commandEcho == 13968		2						
4.3i			Check cmdResult == OK commandEcho == 14256		2						
4.4i			Check cmdResult == OK commandEcho == 1604		2	sramReadReply.1.dat	65536 bytes				
4.5i			Check cmdResult == OK commandEcho == 1614		2	pramReadReply.1.dat	65536 bytes				
4.6i			Check cmdResult == OK commandEcho == 14122		2						
4.7i			Check cmdResult == OK commandEcho == 14124		2						
4.1j			Check cmdResult == OK commandEcho == 14254		2						
4.2j			Check cmdResult == OK commandEcho == 13968		2						
4.3j			Check cmdResult == OK commandEcho == 14256		2						
4.4j			Check cmdResult == OK commandEcho == 1607		2	sramReadReply.1.dat	65536 bytes				
4.5j			Check cmdResult == OK commandEcho == 1616		2	pramReadReply.1.dat	65536 bytes				
4.6j			Check cmdResult == OK commandEcho == 14122		2						

Table 1: **DEA FEP Diagnostics SOT SOP(Page 6)**

Step #	Title (Revision 5.14_V2.2)	Time Req	Command Description	Command Mnemonic	Cmd EGSE	Seq Key	Telemetry Description	Telemetry Mnemonic
4.7j	Power down unused DEA boards		sysConfigTablechangeEntry	XBHILO_UTI				
5.0	Perform diagnostics on selected FEP		Execute one of the subsequences below (5.*a through 5.*f)					
5.1a	Dump FEP0 CSI Control Registers		readFep command	RF0CSIREGS				
5.2a	Dump FEP0 Bus/Bulk ctrl reg		readFep command	RF0HWREGS1				
5.3a	Dump FEP0 Image Controller Reg		readFep command	RF0HWREGS2				
5.4a	Dump FEP0 fepCtl structure		readFep command	RF0FEPCTRL				
5.5a	Dump FEP0 FEP-BEP Mailbox		readFep command	RF0MAILBOX				
5.6a	Dump FEP0 R3000 I-Cache	0.33	readFep command	RF0CACHEIS				
5.7a	Dump FEP0 R3000 D-Cache	0.33	readFep command	RF0CACHEDS				
5.8a	Dump FEP0 start of bias map	0.33	readFep command	RF0BIASMPS				
5.9a	Dump FEP0 start of image map	0.33	readFep command	RF0IMAGMPS				
5.10a	Dump FEP0 start of bias parity map		readFep command	RF0BPARTYS				
5.11a	Dump FEP0 start of pix thresh map		readFep command	RF0THRESHS				
5.12a	Dump FEP0 start of pix oclock map	0.17	readFep command	RF0OVCLMPS				
5.13a	Restart normal DEA housekeeping		startDea command	XDZ0000005				
5.1b	Dump FEP1 CSI Control Registers		readFep command	RF1CSIREGS				

Table 1: **DEA FEP Diagnostics SOT SOP(Page 6)**

Step #	Expected Value	Units	Telemetry EGSE	Other Verifier	Crit	Comments	Notes	RT Con	Tlm Fmt	Min Alt	SIM Pos
4.7j			Check cmdResult == OK commandEcho == 14124		2						
5.0						Execute one of the subsequences below (5.*a through 5.*f)					
5.1a			Check cmdResult == OK commandEcho == 14129		2	fepReadReply.1.dat	52 bytes				
5.2a			Check cmdResult == OK commandEcho == 1935		2	fepReadReply.2.dat	40 bytes				
5.3a			Check cmdResult == OK commandEcho == 1937		2	fepReadReply.3.dat	64 bytes				
5.4a			Check cmdResult == OK commandEcho == 14136		2	fepReadReply.4.dat	1360 bytes				
5.5a			Check cmdResult == OK commandEcho == 14149		2	fepReadReply.5.dat	592 bytes				
5.6a			Check cmdResult == OK commandEcho == 14161		2	fepReadReply.6.dat	32880 bytes				
5.7a			Check cmdResult == OK commandEcho == 14173		2	fepReadReply.7.dat	33296 bytes				
5.8a			Check cmdResult == OK commandEcho == 14184		2	fepReadReply.8.dat	32768 bytes				
5.9a			Check cmdResult == OK commandEcho == 14197		2	fepReadReply.9.dat	32768 bytes				
5.10a			Check cmdResult == OK commandEcho == 14208		2	fepReadReply.10.dat	4096 bytes				
5.11a			Check cmdResult == OK commandEcho == 14220		2	fepReadReply.11.dat	4096 bytes				
5.12a			Check cmdResult == OK commandEcho == 14232		2	fepReadReply.12.dat	8192 bytes				
5.13a			Check cmdResult == OK commandEcho == 18		2						
5.1b			Check cmdResult == OK commandEcho == 14130		2	fepReadReply.1.dat	52 bytes				

Table 1: **DEA FEP Diagnostics SOT SOP(Page 7)**

Step #	Title (Revision 5.14_V2.2)	Time Req	Command Description	Command Mnemonic	Cmd EGSE	Seq Key	Telemetry Description	Telemetry Mnemonic
5.2b	Dump FEP1 Bus/Bulk ctrl reg		readFep command	RF1HWREGS1				
5.3b	Dump FEP1 Image Controller Reg		readFep command	RF1HWREGS2				
5.4b	Dump FEP1 fepCtl structure		readFep command	RF1FEPCTRL				
5.5b	Dump FEP1 FEP-BEP Mailbox		readFep command	RF1MAILBOX				
5.6b	Dump FEP1 R3000 I-Cache	0.33	readFep command	RF1CACHEIS				
5.7b	Dump FEP1 R3000 D-Cache	0.33	readFep command	RF1CACHEDS				
5.8b	Dump FEP1 start of bias map	0.33	readFep command	RF1BIASMPS				
5.9b	Dump FEP1 start of image map	0.33	readFep command	RF1IMAGMPS				
5.10b	Dump FEP1 start of bias parity map		readFep command	RF1BPARTYS				
5.11b	Dump FEP1 start of pix thresh map		readFep command	RF1THRESHS				
5.12b	Dump FEP1 start of pix oclock map	0.17	readFep command	RF1OVCLMPS				
5.13b	Restart normal DEA housekeeping		startDea command	XDZ0000005				
5.1c	Dump FEP2 CSI Control Registers		readFep command	RF2CSIREGS				
5.2c	Dump FEP2 Bus/Bulk ctrl reg		readFep command	RF2HWREGS1				
5.3c	Dump FEP2 Image Controller Reg		readFep command	RF2HWREGS2				
5.4c	Dump FEP2 fepCtl structure		readFep command	RF2FEPCTRL				

Table 1: **DEA FEP Diagnostics SOT SOP(Page 7)**

Step #	Expected Value	Units	Telemetry EGSE	Other Verifier	Crit	Comments	Notes	RT Con	Tlm Fmt	Min Alt	SIM Pos
5.2b			Check cmdResult == OK commandEcho == 1947		2	fepReadReply.2.dat	40 bytes				
5.3b			Check cmdResult == OK commandEcho == 1949		2	fepReadReply.3.dat	64 bytes				
5.4b			Check cmdResult == OK commandEcho == 14139		2	fepReadReply.4.dat	1360 bytes				
5.5b			Check cmdResult == OK commandEcho == 14150		2	fepReadReply.5.dat	592 bytes				
5.6b			Check cmdResult == OK commandEcho == 14162		2	fepReadReply.6.dat	32880 bytes				
5.7b			Check cmdResult == OK commandEcho == 14174		2	fepReadReply.7.dat	33296 bytes				
5.8b			Check cmdResult == OK commandEcho == 14187		2	fepReadReply.8.dat	32768 bytes				
5.9b			Check cmdResult == OK commandEcho == 14198		2	fepReadReply.9.dat	32768 bytes				
5.10b			Check cmdResult == OK commandEcho == 14211		2	fepReadReply.10.dat	4096 bytes				
5.11b			Check cmdResult == OK commandEcho == 14223		2	fepReadReply.11.dat	4096 bytes				
5.12b			Check cmdResult == OK commandEcho == 14235		2	fepReadReply.12.dat	8192 bytes				
5.13b			Check cmdResult == OK commandEcho == 18		2						
5.1c			Check cmdResult == OK commandEcho == 14132		2	fepReadReply.1.dat	52 bytes				
5.2c			Check cmdResult == OK commandEcho == 1963		2	fepReadReply.2.dat	40 bytes				
5.3c			Check cmdResult == OK commandEcho == 1965		2	fepReadReply.3.dat	64 bytes				
5.4c			Check cmdResult == OK commandEcho == 14141		2	fepReadReply.4.dat	1360 bytes				

Table 1: **DEA FEP Diagnostics SOT SOP(Page 8)**

Step #	Title (Revision 5.14_V2.2)	Time Req	Command Description	Command Mnemonic	Cmd EGSE	Seq Key	Telemetry Description	Telemetry Mnemonic
5.5c	Dump FEP2 FEP-BEP Mailbox		readFep command	RF2MAILBOX				
5.6c	Dump FEP2 R3000 I-Cache	0.33	readFep command	RF2CACHEIS				
5.7c	Dump FEP2 R3000 D-Cache	0.33	readFep command	RF2CACHEDS				
5.8c	Dump FEP2 start of bias map	0.33	readFep command	RF2BIASMPS				
5.9c	Dump FEP2 start of image map	0.33	readFep command	RF2IMAGMPS				
5.10c	Dump FEP2 start of bias parity map		readFep command	RF2BPARTYS				
5.11c	Dump FEP2 start of pix thresh map		readFep command	RF2THRESHS				
5.12c	Dump FEP2 start of pix oclock map	0.17	readFep command	RF2OVCLMPS				
5.13c	Restart normal DEA housekeeping		startDea command	XDZ0000005				
5.1d	Dump FEP3 CSI Control Registers		readFep command	RF3CSIREGS				
5.2d	Dump FEP3 Bus/Bulk ctrl reg		readFep command	RF3HWREGS1				
5.3d	Dump FEP3 Image Controller Reg		readFep command	RF3HWREGS2				
5.4d	Dump FEP3 fepCtl structure		readFep command	RF3FEPCTRL				
5.5d	Dump FEP3 FEP-BEP Mailbox		readFep command	RF3MAILBOX				
5.6d	Dump FEP3 R3000 I-Cache	0.33	readFep command	RF3CACHEIS				
5.7d	Dump FEP3 R3000 D-Cache	0.33	readFep command	RF3CACHEDS				

Table 1: **DEA FEP Diagnostics SOT SOP(Page 8)**

Step #	Expected Value	Units	Telemetry EGSE	Other Verifier	Crit	Comments	Notes	RT Con	Tlm Fmt	Min Alt	SIM Pos
5.5c			Check cmdResult == OK commandEcho == 14153		2	fepReadReply.5.dat	592 bytes				
5.6c			Check cmdResult == OK commandEcho == 14164		2	fepReadReply.6.dat	32880 bytes				
5.7c			Check cmdResult == OK commandEcho == 14177		2	fepReadReply.7.dat	33296 bytes				
5.8c			Check cmdResult == OK commandEcho == 14189		2	fepReadReply.8.dat	32768 bytes				
5.9c			Check cmdResult == OK commandEcho == 14201		2	fepReadReply.9.dat	32768 bytes				
5.10c			Check cmdResult == OK commandEcho == 14213		2	fepReadReply.10.dat	4096 bytes				
5.11c			Check cmdResult == OK commandEcho == 14225		2	fepReadReply.11.dat	4096 bytes				
5.12c			Check cmdResult == OK commandEcho == 14237		2	fepReadReply.12.dat	8192 bytes				
5.13c			Check cmdResult == OK commandEcho == 18		2						
5.1d			Check cmdResult == OK commandEcho == 14135		2	fepReadReply.1.dat	52 bytes				
5.2d			Check cmdResult == OK commandEcho == 1977		2	fepReadReply.2.dat	40 bytes				
5.3d			Check cmdResult == OK commandEcho == 1978		2	fepReadReply.3.dat	64 bytes				
5.4d			Check cmdResult == OK commandEcho == 14142		2	fepReadReply.4.dat	1360 bytes				
5.5d			Check cmdResult == OK commandEcho == 14154		2	fepReadReply.5.dat	592 bytes				
5.6d			Check cmdResult == OK commandEcho == 14167		2	fepReadReply.6.dat	32880 bytes				
5.7d			Check cmdResult == OK commandEcho == 14178		2	fepReadReply.7.dat	33296 bytes				

Table 1: **DEA FEP Diagnostics SOT SOP(Page 9)**

Step #	Title (Revision 5.14_V2.2)	Time Req	Command Description	Command Mnemonic	Cmd EGSE	Seq Key	Telemetry Description	Telemetry Mnemonic
5.8d	Dump FEP3 start of bias map	0.33	readFep command	RF3BIASMPS				
5.9d	Dump FEP3 start of image map	0.33	readFep command	RF3IMAGMPS				
5.10d	Dump FEP3 start of bias parity map		readFep command	RF3BPARTYS				
5.11d	Dump FEP3 start of pix thresh map		readFep command	RF3THRESHS				
5.12d	Dump FEP3 start of pix oclock map	0.17	readFep command	RF3OVCLMPS				
5.13d	Restart normal DEA housekeeping		startDea command	XDZ0000005				
5.1e	Dump FEP4 CSI Control Registers		readFep command	RF4CSIREGS				
5.2e	Dump FEP4 Bus/Bulk ctrl reg		readFep command	RF4HWREGS1				
5.3e	Dump FEP4 Image Controller Reg		readFep command	RF4HWREGS2				
5.4e	Dump FEP4 fepCtl structure		readFep command	RF4FEPCTRL				
5.5e	Dump FEP4 FEP-BEP Mailbox		readFep command	RF4MAILBOX				
5.6e	Dump FEP4 R3000 I-Cache	0.33	readFep command	RF4CACHEIS				
5.7e	Dump FEP4 R3000 D-Cache	0.33	readFep command	RF4CACHEDS				
5.8e	Dump FEP4 start of bias map	0.33	readFep command	RF4BIASMPS				
5.9e	Dump FEP4 start of image map	0.33	readFep command	RF4IMAGMPS				
5.10e	Dump FEP4 start of bias parity map		readFep command	RF4BPARTYS				

Table 1: **DEA FEP Diagnostics SOT SOP(Page 9)**

Step #	Expected Value	Units	Telemetry EGSE	Other Verifier	Crit	Comments	Notes	RT Con	Tlm Fmt	Min Alt	SIM Pos
5.8d			Check cmdResult == OK commandEcho == 14190		2	fepReadReply.8.dat	32768 bytes				
5.9d			Check cmdResult == OK commandEcho == 14202		2	fepReadReply.9.dat	32768 bytes				
5.10d			Check cmdResult == OK commandEcho == 14214		2	fepReadReply.10.dat	4096 bytes				
5.11d			Check cmdResult == OK commandEcho == 14226		2	fepReadReply.11.dat	4096 bytes				
5.12d			Check cmdResult == OK commandEcho == 14238		2	fepReadReply.12.dat	8192 bytes				
5.13d			Check cmdResult == OK commandEcho == 18		2						
5.1e			Check cmdResult == OK commandEcho == 14259		2	fepReadReply.1.dat	52 bytes				
5.2e			Check cmdResult == OK commandEcho == 1991		2	fepReadReply.2.dat	40 bytes				
5.3e			Check cmdResult == OK commandEcho == 1992		2	fepReadReply.3.dat	64 bytes				
5.4e			Check cmdResult == OK commandEcho == 14144		2	fepReadReply.4.dat	1360 bytes				
5.5e			Check cmdResult == OK commandEcho == 14156		2	fepReadReply.5.dat	592 bytes				
5.6e			Check cmdResult == OK commandEcho == 14168		2	fepReadReply.6.dat	32880 bytes				
5.7e			Check cmdResult == OK commandEcho == 14180		2	fepReadReply.7.dat	33296 bytes				
5.8e			Check cmdResult == OK commandEcho == 14192		2	fepReadReply.8.dat	32768 bytes				
5.9e			Check cmdResult == OK commandEcho == 14204		2	fepReadReply.9.dat	32768 bytes				
5.10e			Check cmdResult == OK commandEcho == 14217		2	fepReadReply.10.dat	4096 bytes				

Table 1: **DEA FEP Diagnostics SOT SOP(Page 10)**

Step #	Title (Revision 5.14_V2.2)	Time Req	Command Description	Command Mnemonic	Cmd EGSE	Seq Key	Telemetry Description	Telemetry Mnemonic
5.11e	Dump FEP4 start of pix thresh map		readFep command	RF4THRESHS				
5.12e	Dump FEP4 start of pix oclock map	0.17	readFep command	RF4OVCLMPS				
5.13e	Restart normal DEA house-keeping		startDea command	XDZ0000005				
5.1f	Dump FEP5 CSI Control Registers		readFep command	RF5CSIREGS				
5.2f	Dump FEP5 Bus/Bulk ctrl reg		readFep command	RF5HWREGS1				
5.3f	Dump FEP5 Image Controller Reg		readFep command	RF5HWREGS2				
5.4f	Dump FEP5 fepCtl structure		readFep command	RF5FEPCTRL				
5.5f	Dump FEP5 FEP-BEP Mailbox		readFep command	RF5MAILBOX				
5.6f	Dump FEP5 R3000 I-Cache	0.33	readFep command	RF5CACHEIS				
5.7f	Dump FEP5 R3000 D-Cache	0.33	readFep command	RF5CACHEDS				
5.8f	Dump FEP5 start of bias map	0.33	readFep command	RF5BIASMPS				
5.9f	Dump FEP5 start of image map	0.33	readFep command	RF5IMAGMPS				
5.10f	Dump FEP5 start of bias parity map		readFep command	RF5BPARTYS				
5.11f	Dump FEP5 start of pix thresh map		readFep command	RF5THRESHS				
5.12f	Dump FEP5 start of pix oclock map	0.17	readFep command	RF5OVCLMPS				
5.13f	Restart normal DEA house-keeping		startDea command	XDZ0000005				

Table 1: **DEA FEP Diagnostics SOT SOP(Page 10)**

Step #	Expected Value	Units	Telemetry EGSE	Other Verifier	Crit	Comments	Notes	RT Con	Tlm Fmt	Min Alt	SIM Pos
5.11e			Check cmdResult == OK commandEcho == 14228		2	fepReadReply.11.dat	4096 bytes				
5.12e			Check cmdResult == OK commandEcho == 14241		2	fepReadReply.12.dat	8192 bytes				
5.13e			Check cmdResult == OK commandEcho == 18		2						
5.1f			Check cmdResult == OK commandEcho == 14261		2	fepReadReply.1.dat	52 bytes				
5.2f			Check cmdResult == OK commandEcho == 2005		2	fepReadReply.2.dat	40 bytes				
5.3f			Check cmdResult == OK commandEcho == 2006		2	fepReadReply.3.dat	64 bytes				
5.4f			Check cmdResult == OK commandEcho == 14147		2	fepReadReply.4.dat	1360 bytes				
5.5f			Check cmdResult == OK commandEcho == 14159		2	fepReadReply.5.dat	592 bytes				
5.6f			Check cmdResult == OK commandEcho == 14171		2	fepReadReply.6.dat	32880 bytes				
5.7f			Check cmdResult == OK commandEcho == 14183		2	fepReadReply.7.dat	33296 bytes				
5.8f			Check cmdResult == OK commandEcho == 14195		2	fepReadReply.8.dat	32768 bytes				
5.9f			Check cmdResult == OK commandEcho == 14207		2	fepReadReply.9.dat	32768 bytes				
5.10f			Check cmdResult == OK commandEcho == 14218		2	fepReadReply.10.dat	4096 bytes				
5.11f			Check cmdResult == OK commandEcho == 14231		2	fepReadReply.11.dat	4096 bytes				
5.12f			Check cmdResult == OK commandEcho == 14242		2	fepReadReply.12.dat	8192 bytes				
5.13f			Check cmdResult == OK commandEcho == 18		2						

Table 1: **DEA FEP Diagnostics SOT SOP(Page 11)**

Step #	Title (Revision 5.14_V2.2)	Time Req	Command Description	Command Mnemonic	Cmd EGSE	Seq Key	Telemetry Description	Telemetry Mnemonic
6.0	Resume all active FEPs							
6.1	Resume all active FEPs		fepManager.distributeCmd	XBFEP_RESM				

Table 1: **DEA FEP Diagnostics SOT SOP(Page 11)**

Step #	Expected Value	Units	Telemetry EGSE	Other Verifier	Crit	Comments	Notes	RT Con	Tlm Fmt	Min Alt	SIM Pos
6.0											
6.1			Check cmdResult == OK commandEcho == 14244		2						