Procedure. Ref.:	**SVT_OPM_5500 (1,1)**	PULSE HEIGHT DIST - ENG MODE 6 (30s)

Procedure Title:	Pulse Height Dist - Eng Mode 6 (30s)
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Purpose of Procedure:

This procedure executes an Engineering Mode 6 - Pulse Height Distribution exposure, duration 30 seconds with a threshold of 0.

This Engineering Mode is used to characterise the intensifier and CCD charateristics. The data consists of a compressed Event Height Histogram generated as a 1x256 pseudo image. The MIC detector is in Engineering Modes 6 or 7 and the DPU is in Engineering Mode 6.

Note: Each Engineering Mode corrupts DPU Memory, therefore DPU needs to be cleaned up at the end of each Engineering Exposure. To allow for modularity of the Engineering exposures this intialisation is executed at both the beginning and end of each Engineering Exposure.

This procedure is foreseen to be used during the OM SVT.

Initial State: OM ON in IDLE Mode, FW BLOCKED, FLOOD LEDs at Level 1.

Final State: OM ON in IDLE Mode, FW BLOCKED, FLOOD LEDs at Level 1.

Step	Time	Activity/Remarks	Command	TM Verification
1		Confirm OM in an Operational Mode. TM_H5395 is IDLE		_**AND: H100**_ _**AND: H110**_ H5395 "OM STATE" = IDLE H5405 "ICU STATE" = OPERATIONAL H5450 "DPU STATE" = DPUOS H5195 "FLOOD LED BIAS" = 1 H5265 "FW POS COUNTER" = 1200
2		Change Mode to ICU Mode 4 - ENGINEERING Mode.	**H9004** GOTO ENG	_**AND: H100**_ H5395 "OM STATE" = ENGINEERING H5405 "ICU STATE" = OPERATIONAL H5450 "DPU STATE" = DPUOS
3		Intialise the DPU. Zeroes the memory and readies swap units. Confirm TC Packet count increments.	**H7248** INIT DPU	_**AND: H100**_ H5385 "TC PACKET COUNT" = increment by 1
4	00:00:25	Wait up to 25 seconds for the DA_EOT_INIT_DPU Event. Packet 92210 (PK Dump 1154 OM4)		_**AND: H910**_ H7675 "EXPOSURE NUMBER" = H7680 "TIMESTAMP" =
5		Set the DPU Frame Time (in units of 1/1024s) to allow for a 30 second exposure. DPU Frame time = 30sx1024 = 30720 Confirm TC Packet count increments.	**H7236** SET FRAME TIME **H0710** "NUM DPU CYCLES" = 30720 msec	_**AND: H100**_ H5385 "TC PACKET COUNT" = increment by 1
6		Set Exposure ID. Confirm TC Packet count increments.	**H7238** SET EXPOSURE ID **H0530** "EXPOSURE ID" = 100	_**AND: H100**_ H5385 "TC PACKET COUNT" = increment by 1
7		Initialise the Exposure by sending the IC_INIT_EXP task This command sets up the DPU to acquire detector data in 1kx1k format (I.e. detector binned by 2)	**H7249** INIT EXPOSURE	_**AND: H100**_ H5385 "TC PACKET COUNT" = increment by 1
8	00:00:03	Wait for up to 3 seconds for the Initialise Exposure End of Task event. EOT_INIT_EXP. Packet 92213 (PK Dump 1158 OM4)		_**AND: H910**_ H7675 "EXPOSURE NUMBER" = 100 H7680 "TIMESTAMP" =

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9		Load Window Table. 1 Window 256 x256 with Xlow = 52, Y low = 27	**H7110** LOAD WINDOW TAB **H0010 "VERIFICATION CTL" = ENABLED **H0040 "NO OF WINDOWS" = 1 **H0050 "XLOW WINDOW 1" = 52 **H0051 "YLOW WINDOW 1" = 27 **H0052 "XSIZE WINDOW 1" = 256 **H0053 "YSIZE WINDOW 1" = 256 H0054 "XLOW WINDOW 2" = 0.000 H0055 "YLOW WINDOW 2" = 0.000 H0056 "XSIZE WINDOW 2" = 0.000 H0057 "YSIZE WINDOW 2" = 0.000 H0058 "XLOW WINDOW 3" = 0.000 H0059 "YLOW WINDOW 3" = 0.000 H0060 "XSIZE WINDOW 3" = 0.000 H0061 "YSIZE WINDOW 3" = 0.000 H0062 "XLOW WINDOW 4" = 0.000 H0063 "YLOW WINDOW 4" = 0.000 H0064 "XSIZE WINDOW 4" = 0.000 H0065 "YSIZE WINDOW 4" = 0.000 H0066 "XLOW WINDOW 5" = 0.000 H0067 "YLOW WINDOW 5" = 0.000 H0068 "XSIZE WINDOW 5" = 0.000 H0069 "YSIZE WINDOW 5" = 0.000 H0070 "XLOW WINDOW 6" = 0.000 H0071 "YLOW WINDOW 6" = 0.000 H0072 "XSIZE WINDOW 6" = 0.000 H0073 "YSIZE WINDOW 6" = 0.000 H0074 "XLOW WINDOW 7" = 0.000 H0075 "YLOW WINDOW 7" = 0.000 H0076 "XSIZE WINDOW 7" = 0.000 H0077 "YSIZE WINDOW 7" = 0.000 H0078 "XLOW WINDOW 8" = 0.000 H0079 "YLOW WINDOW 8" = 0.000 H0080 "XSIZE WINDOW 8" = 0.000 H0081 "YSIZE WINDOW 8" = 0.000 H0082 "XLOW WINDOW 9" = 0.000 H0083 "YLOW WINDOW 9" = 0.000 H0084 "XSIZE WINDOW 9" = 0.000 H0085 "YSIZE WINDOW 9" = 0.000 H0086 "XLOW WINDOW 10" = 0.000 H0087 "YLOW WINDOW 10" = 0.000 H0088 "XSIZE WINDOW 10" = 0.000 H0089 "YSIZE WINDOW 10" = 0.000 H0090 "XLOW WINDOW 11" = 0.000 H0091 "YLOW WINDOW 11" = 0.000 H0092 "XSIZE WINDOW 11" = 0.000 H0093 "YSIZE WINDOW 11" = 0.000 H0094 "XLOW WINDOW 12" = 0.000 H0095 "YLOW WINDOW 12" = 0.000 H0096 "XSIZE WINDOW 12" = 0.000 H0097 "YSIZE WINDOW 12" = 0.000 H0098 "XLOW WINDOW 13" = 0.000 H0099 "YLOW WINDOW 13" = 0.000 H0100 "XSIZE WINDOW 13" = 0.000 H0101 "YSIZE WINDOW 13" = 0.000 H0102 "XLOW WINDOW 14" = 0.000 H0103 "YLOW WINDOW 14" = 0.000 H0104 "XSIZE WINDOW 14" = 0.000 H0105 "YSIZE WINDOW 14" = 0.000 H0106 "XLOW WINDOW 15" = 0.000 H0107 "YLOW WINDOW 15" = 0.000 H0108 "XSIZE WINDOW 15" = 0.000 H0109 "YSIZE WINDOW 15" = 0.000	
10		Load window defined in previous step. This TC starts the Load Window task.	**H5110** LOAD WINDOW TAB	

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11	00:01:00	Wait up to 60 seconds for the Detector Event. This packet signals that the window table has been loaded into the detector. Packet 92100 (PK Dump 1016 OM4)		***AND: H911*** H7000 "DETECTOR EVENT" = WIN TAB LOAD
12		Confirm Frame Tags are disabled. Disables the Detector Integration Frame Tag (2 words of all zeroes) transmitted at the start of each frame. Frame Tags should be disabled for Engineering Modes.	**H7135** SET FRAME TAG **H0016 "ENABLE CNTL" = DISABLED	***AND: H110*** H5220 "FRAME TAG CNTL" = DISABLED
13		Set Detector Threshold to 0 to allow full pulse height data to be acquired.	**H7131** SET EVT THRESH H0120 "THRESHOLD" = 0.000	***AND: H110*** H5235 "EVT DET THRESH" = 0
14		Set Detector Acquisition Mode	**H7130** LOAD ACQ MODE **H0110 "ACQ MODE" = ENG EVT HT	***AND: H110*** H5215 "ACQUISITION MODE" = ENG EVT HT
15		Start sending events from MIC (Micro Channel Plate Intensified CCD). When the integrationis enabled data is sent on to the DPU at the start of the next frame.	**H5130** START DET INT	
16		START EXPOSURE Start Enginering exposure by enabling the DPU Engineering Mode in the appropratie mode. (IC_ENBL_ENG) The ICU commands the Detector to transmit the Eng data to the Blue DSPs in the DPU.	**H7254** ENABLE ENG **H0880 "MODE" = INTENSIFIER	
17	00:00:30	Wait up to 30 s for the End of Exposure Alert DA_ENDOF_EXP. Alert indicates the end of the Exposure Task. At this point Blue DSP processing is disabled. (note: Alert DA_EOT_ENG is not nominally enabled) Packet 92205 (PK Dump 1149 OM4)		***AND: H910*** H7675 "EXPOSURE NUMBER" =100 H7680 "TIMESTAMP" = H7640 "FRAME TIME" = H7645 "FRAMES/EXPOSURE" =
18	00:00:20	Wait up to 20 s for complete exposure event DA_COMPLETE_EXP Packet 92209 (PK Dump 1153 OM4) This alert signals the completion of the last frame of an exposure. It also indicates the full submission of the science data to the compression queue.		***AND: H910*** H7675 "EXPOSURE NUMBER" =100 H7680 "TIMESTAMP" =
19	00:00:20	Wait up to 20 s for telemetry dump to finish. DA_DATA_END Mulitple Engineering data Packets 97322 (SOC Only). 92207 Data End event PK Dump 1151 OM4) Indicates that the end of data has been reached.		***AND: H910*** H7675 "EXPOSURE NUMBER" =100 H7680 "TIMESTAMP" =

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20		Intialise the DPU. Zeroes the memory and readies swap units for next exposure.	**H7248** INIT DPU	
21	00:00:25	Wait up to 25 seconds for the DA_EOT_INIT_DPU Event. Packet 92210 (PK Dump 1154 OM4)		*AND: H910* H7675 "EXPOSURE NUMBER" =100 H7680 "TIMESTAMP" =
22		Change Mode to ICU Mode 2 - IDLE Mode.	**H9002** GOTO IDLE	*AND: H100* H5395 "OM STATE" = IDLE H5405 "ICU STATE" = OPERATIONAL H5450 "DPU STATE" = DPUOS
23		END OF PROCEDURE		