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| CAP | CHANDRA |

**Command Action Procedure**

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| **CAP #** | 1545A | **Originator:** | Ken Gage/Dan Patnaude |
| **Date:** | 09/07/2020 | **Commands Checked By:** | HRC Ops |
| **Participants**  **Required for**  **Execution:** | OC  CC, HRC | **Time of CAP execution:** | (OC to write in) |

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| **Title:**  HRC PMT#2 controlled power on | | | | |
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| **Description/Rationale:**  Following successful completion of CAP 1543, the HRC is currently in standby. As part of a plan to resume nominal HRC operations, the HRC anti-coincidence shield (PMT#2) must be powered on and its performance evaluated. This CAP performs a controlled ramp up of the high voltage for PMT#2. Additionally, the CAP loads commands into SCS 132 to perform RADMON disable and re-enable for the radzone passages which begin on DOYs 253 and 256. | |  |  |  | |
| **Restrictions/Warnings/Notes**   * The HRC team will be monitoring the expected PMT#2 rates during the execution of this CAP. If the PMT#2 rates greatly exceed the expected value of ~ 5000 c/s, the PMT#2 will be powered down and the CAP will be halted. In this event, SCS 132 will be terminated and cleared.   **Yes ☐ No X** **CAP requires enabling of a disabled command? If yes, provide a list of**  **Disabled Commands** | |  |  |  | |
| **CARD Items:** | |  |  |  | |
| **Schedule Requirements/Load Interaction:**  **Yes x** **No ☐** Daily load commands exist during execution window of CAP  **Yes x No** ☐ CAP requires specific DSN comm. or timing requirements  **Yes ☐ No x** CAP will be run concurrently with another CAP  **Yes ☐** **No x** CAP requires commanding in the load to be executed to ensure success  **Yes ☐ No x** Daily load requires the CAP to be completed to ensure success  **Yes x No** ☐ CAP uses SCS slots. If yes, performs SCS cleanup  **Comments:**   * The CAP is to be executed during the DSS-26 comm pass on 2020:251:23:45:00.000. * The HRC team estimates that the CAP can be completed and the PMT#2 performance can be evaluated within the scheduled 6hr15min comm window * Commands exist in the daily loads for transmitter turn-on at 252:02:30 UT * Commands exist in the daily load for transmitter turn-off and a command to NORM subformat at 2020:252:04:00 UT * The CAP loads commands into SCS 132. The SCS is to be enabled and activated prior to manually raising the PMT#2 high voltage | |  |  |  | |
| **Initial Conditions/Spacecraft Configuration:**   * The CAP expects the HRC power supplies to be on at nominal voltages. * The CAP expects PMT#2 to be connected to the side B preamps. * The CAP expects the flight software has been patched to use side B HRC shield and MCP rates for RadMon handling   **CAP depends upon or changes the state of:** | |  |  |  | |
| ☐ Telemetry Format  **x** Safing Monitor En\Dis State (inc. RadMon)  ☐ OBSID  ☐ Momentum State  ☐ Attitude  ☐ PCAD Mode  **☐** S/C Unit Configuration (H/W or S/W)  ☐ Ground System Configuration/Settings  ☐ S/C Clock (VCDU) | ☐ SIM Table Position  ☐ Grating Positions  ☐ SI Mode  ☐ ACIS Parameter Blocks  **x** HRC Configuration  **x** SCS States or Contents  ☐ Dither State  ☐ FSW Element |  |  |  | |
| **Comments:**   * The CAP changes the state of the HRC. It raises the voltage steps of PMT#2 to operational levels * The CAP enables SCS 107 and sends commands to enable RADMON * The CAP depends upon command loads 2A\_RADSAFE\_132.CLD being activated and enabled in SCS 132. This load contains commands for two radzone passes, beginning on DOY 253 and again DOY 256. | |  |  |  | |
| **Risk/Comm. Loss/Worst Case Scenario:**  **What happens if comm. is lost during CAP execution?**  Loads are enabled and activated prior to the PMT#2 power up sequence. This ensures that the PMT#2 will be powered down before entering the radiation belt. If comm is lost during CAP execution, the PMT#2 may be left with off nominal HV. It will be safed prior to radiation belt entry. All efforts should be made to resume the CAP at the next available comm opportunity which is not located in a radzone pass.  **What is the worst case scenario for CAP execution? (Assuming the CAP is executed correctly)**  The worst case scenario is that the PMT#2 does not come on as expected. If this happens, we will command the PMT#2 off, and terminate and clear SCS 132. | |  |  |  | |
| **Required Products (Scripts, Displays, SOPs, etc.):**   |  |  |  | | --- | --- | --- | | **Product Name** | **Version** | **On-Console** | | O\_SCSCTRL.ssc | 3.4 | **☐** | | HRC\_SH2\_ACT\_SLOW.ssc | 3.1 | **☐** | | F\_MAIN.dsp | 3.10 | **☐** | | I\_HRC\_SOH.dsp | 3.10 | **☐** | | F\_HRC\_ALL.dec | 2.1 | **☐** | | O\_PROT\_SCSCTRL.ssc | 3.2 | **☐** |  |  |  |  | | --- | --- | --- | | **Command Load Name** | **Checksum (if applicable)** | **In ODB** | | 2A\_RADSAFE\_132.cld | DDBD597 | **☐** | |  |  | **☐** | |  |  | **☐** | | |  |  |  | |

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| **Instructions:**  **CONTINGENCY STEPS**  If required at any point, and at the direction of the HRC team:   1. (**OPTIONAL**) send command **2S2HVOF**   HRC verify PMT #2 HV OFF: 2S2ONST = OFF   1. (**OPTIONAL**) using script **O\_SCSCTRL**, terminate and clear **SCS 132**   **Load and activate radiation zone handling ATS**   1. Use script **O\_PROT\_SCSCTRL** to enable **SCS 107** 2. Uplink Command load 2A\_RADSAFE\_132.cld Checksum = DDBD597   63 Commands   1. Using script **O\_SCSCTRL**, Enable and Activate **SCS 132** 2. Uplink command **OORMPEN**   Verify RADMON Enabled: CORADMEN = ENAB  **Power up PMT#2**   1. Start Script **HRC\_SH2\_ACT\_SLOW** and hold at the INITIAL WAIT 2. On HRC Go, **Resume** script   Script will buffer command  2S2STHV, 2S2STHV2=0 Set PMT #2 step to 0   1. On HRC Go, **Resume** to uplink command   HRC verify PMT #2 step level: 2S2HVST = 0  Script will buffer command  2S2HVON Turn on PMT #2 HVPS   1. On HRC Go, **Resume** to uplink command   HRC verify PMT #2 HV ON: 2S2ONST = ON  Script will buffer command  2S2STHV, 2S2STHV2=2 Set PMT #2 step to 2   1. On HRC Go, **Resume** to uplink command   HRC verify PMT #2 step level: 2S2HVST = 2  Script will buffer command  2S2STHV, 2S2STHV2=4 Set PMT #2 step to 4   1. On HRC Go, **Resume** to uplink command   HRC verify PMT #2 step level: 2S2HVST = 4  Script will buffer command  2S2STHV, 2S2STHV2=6 Set PMT #2 step to 6   1. On HRC Go, **Resume** to uplink command   HRC verify PMT #2 step level: 2S2HVST = 6  Script will buffer command  2S2STHV, 2S2STHV2=7 Set PMT #2 step to 7   1. On HRC Go, **Resume** to uplink command   HRC verify PMT #2 step level: 2S2HVST = 7  Script will buffer command  2S2STHV, 2S2STHV2=8 Set PMT #2 step to 8   1. On HRC Go, **Resume** to uplink command   HRC verify PMT #2 step level: 2S2HVST = 8   1. HRC determine if PMT#2 step level of 9 is desired   If Step level of 9 is not desired:  Stop and exit script **HRC\_SH2\_ACT\_SLOW**   1. If Step level of 9 is desired: On HRC Go, **Resume** script   Script will buffer command  2S2STHV, 2S2STHV2=9 Set PMT #2 step to 9   1. On HRC Go, **Resume** to uplink command   HRC verify PMT #2 step level: 2S2HVST = 9   1. On HRC Go, **Resume** to end script **HRC\_SH2\_ACT\_SLOW** and exit | | | |
| **SOT Manager/Lead:** |  | **Mission Planning Manager:** |  |
| **OC or Ops Manager:** |  | **FOM:** |  |
| **Sys. Engineer:** |  | **Flight Director:** |  |