CAP   *CHANDRA*

Command Action Procedure

CAP #	1319	**Originator:**	R. Edgar
Date:	6/9/14	**Commands Checked By:**	P. Plucinsky
Participants	OC	**Time of CAP Execution (GMT):**	**Year: 2014 Day: 162**
Required for	CC	**DSS:**	**BOT: 162:14:45z**
Execution:	ACIS		**EOT: 162:16:45z**

Title: Uplink of ACIS Flight SW Standard F, Optional G with SOP_ACIS_SW_STDFOPTG.doc

Description/Rationale: This CAP will issue a stop science, execute SOP_ACIS_SW_STDFOPTG to uplink ACIS Flight Software version 53 (Standard F, Optional G patches) to ACIS. The SOP will then reboot the BEP and restart the DEA Housekeeping. Current flight software is version 50, Standard E Optional F.

Restrictions/Warnings/Notes:

NOTE that all telemetry verifiers, except for the verifier for the Stop Science command in Step 3 below, are called out in SOP_ACIS_SW_STDFOPTG.doc and will not be repeated here for space reasons. Additional verifiers for ACIS Ops only can be found in 4.28_V2.0 Flight Software Patch Standard F, Optional Patch G which ACIS Ops will have on their console.

Once started, the CAP must be complete by 162:18:08Z - prior to the next ACIS command in the JUN0914A load.

The daily load JUN0914A contains commanding to turn on the transmitter at 162:15:45z. This may result in momentarily poor communications. Execution of the SOP should pause for a few minutes at this time.

☐ CAP requires enabling of a disabled command? If yes, provide a list of Disabled Commands

_____

_____

_____

CARD Items:

NONE

Schedule Requirements/Load Interaction:
CAP execution window if applicable: 162:14:45Z to 162:16:45Z N/A ☐
CAP duration: 30 minutes
CAP verified against JUN0914A daily loads if applicable: N/A ☐

☒ Daily load commands exist during execution window of CAP
☒ CAP requires specific DSN comm. or timing requirements
☐ CAP will be run concurrently with another CAP

☐ CAP requires commanding in the load to be executed to ensure success
☐ Daily load requires the CAP to be completed to ensure success
☒ CAP uses SCS slots. If yes, performs SCS cleanup

Comments: This CAP will be run during a perigee crossing. This CAP contains the command to stop the ECS measurement if one is in progress at the beginning of the CAP.   The daily load, JUN0914A, will continue running during this CAP. The last part of the SOP uses SCS slots and performs the cleanup. The comm will start at 162:14:45.   If a science run is in progress at the start of this CAP, a Stop Science must be issued prior to the execution of the SOP.

Initial Conditions/Spacecraft Configuration:

CAP depends upon or changes the state of:

☒	Telemetry Format\Subformat	☐	SIM Table Position
☐	Safing Monitor En\Dis State (inc. RadMon)	☐	Grating Positions
☐	OBSID	☒	SI Mode
☐	Momentum State	☒	ACIS Parameter Blocks
☐	Attitude	☐	HRC Configuration
☐	PCAD Mode	☒	SCS States or Contents
☒	S/C Unit Configuration (H/W or S/W)	☐	Dither State
☐	Ground System Configuration/Settings	☐	FSW Element
☐	S/C Clock (VCDU)		

Comments: This CAP must be executed in Format 2. The expected state of ACIS is idle. If a science run is in progress, a Stop Science must be executed at the beginning of the CAP.

The initial state of ACIS is expected to be:
DPA-A and/or -B is ON
Flight software is running on BEP-A.

An SCS is used in the event a science run is in progress, to issue a Stop Science command. If used, it is also cleared and disabled by this CAP.

Risk/Comm. Loss/Worst Case Scenario:

What happens if comm. is lost during CAP execution?
• If before reboot, no change to the existing software. Flight software version 50 continues.
•   Patch area may have been cleared.
• If after reboot, flight software may be version 53 or 11, depending on the result of the reboot.
•   If BEP has a watchdog reboot, flight software will revert to version 11.
•   SOT/FOT finds the next reasonable comm to reload this flight software patch.

What is the worst case scenario for CAP execution? (Assuming the CAP is executed correctly)
The worst case scenario is that the CAP leaves the ACIS BEP in a watchdog reboot state where the flight software version is 11. CC mode runs and EVENT HISTOGRAMS would not execute properly. The ACIS RADMON txings mechanism would not function. We would want to re-execute the CAP at the earliest possible time. A comm of two hours will need to be scheduled and approved to re-execute this CAP.

Required Products (Scripts, Displays, SOPs, etc.):

Product Name	Version	On-Console
I_ACIS_E_NEW.dsp		☒
F_MAIN.dsp [EHS]	3.1	☒
C_SET_FORMAT.SSC	3.3	☒
O_SCSCTRL.SSC	3.4	☒
O_STATUS.dec	3.4	☒
I_ACIS_SW_STDFOPTG.ssc	3.1	☒
I_ACIS_SW_STDEOPTF.ssc	3.1	☒
SOP_ACIS_SW_STDFOPTG.doc	3.0	☒
SOP_ACIS_SW_STDEOPTF.doc	3.0	☒
4.28_V2.0 Flight Software Patch Standard F Optional Patch G	2.0	SOT ACIS ONLY
SOP_ACIS_FSW_DUMP.doc	3.2	☒
SOP_ACIS_WARMBOOT_DEAHOUSKEEPING.doc	3.0	☒

Command Load Name	Checksum (if applicable)	In ODB
1R_AU000.CLD	N/A	☒
1R_RU000.CLD	N/A	☒
1R_FSW_STDF.CLD	N/A	☒
1A_AA000_191.CLD	502066E	☒
1R_SMTIMED_OPTG.CLD	N/A	☒
1R_CC3X3_OPTG.CLD	N/A	☒
1R_EVHIST_OPTG.CLD	N/A	☒
1R_CMPRS_OPTG.CLD	N/A	☒
1R_TXING_OPTG.CLD	N/A	☒
1R_FSWVER_053.CLD	N/A	☒
1R_FF001.CLD	N/A	☒
1A_WD000_137	8A158A7	☒
1A_XD000_185	4420F12	☒
1B_WD000_137	8A158A7	☒
1B_XD000_185	4420F12	☒

Instructions

1. **If TLM FMT = 2,**
   Switch to EPS subformat
   Verifiers on F_MAIN: CTUFMTSL = 2, COTLRDSF = EPS
   else
   Set telemetry format to 2, subformat to EPS
   Uses script C_SET_FORMAT with inputs FMT2 and EPS
   Verifiers on F_MAIN: CTUFMTSL = 2, COTLRDSF = EPS

2. **ACIS checks to see if an ECS measurement is in progress. If not, proceed to Step 6.**

3. **OC/CC uplinks the command load:**
   1A_AA000_191.CLD
   CHECKSUM = 502066E
   ONLMLDS1 = Increments by 1 [Memloads Executed]

4. **OC enable and activate SCS 191, ACIS confirms "AA00000000", cmdID=1539**
   Use Script O_SCSCTRL with inputs ENABACTI and 191
   Verifier on display O_STATUS.dec

5. **OC clear and disable SCS slot 191**
   Uses script O_SCSCTRL (with script inputs "CLEAR" and the SCS 191).

6. **Execute SOP_ACIS_SW_STDFOPTG to run script I_ACIS_SW_STDFOPTG.ssc**
   to uplink the new ACIS flight software.

7. **All verifiers are in the SOP.**

SOT Manager/Lead:		**Mission Planning Manager:**	
OC or Ops Manager:		**FOM:**	
Sys. Engineer:		**Flight Director:**	