# CAP CHANDRA

# Command Action Procedure

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| **CAP # 1375** | | **Originator:** | C. Grant/J. ZuHone |
| **Date:** | | **Commands Checked By:** | Ken Gage |
| **Participants** | OC | | |
| **Required for** | CC | **Time of CAP execution:** | |
| **Execution:** | ACIS | | |

**Title:**
Monitoring the active ACIS EEPROM

**Description/Rationale:**
This procedure is for monitoring the EEPROM from the active BEP to check for possible degradation. The EEPROM contains the bootstrap loader and the code that initializes I_CACHE and D_CACHE.

The eeprom_cksum program computes the 32-bit cyclic redundancy checksum of the EEPROM. It is loaded into BEP I_CACHE with a single writeBep command, and is executed by an executeBep command. The checksum is compared with the 'expected' value; if they match, the program waits for 10 seconds before returning causing the subsequent dump command to fail; otherwise it returns immediately and the subsequent dump command will be processed resulting in a full dump of the EEPROM contents. In both cases the actual checksum value is reported.

This procedure will run the eeprom_cksum program twice; first with the correct checksum for the flight EEPROM, and second with a deliberately bogus checksum. The second bogus run will force an EEPROM dump.

ACIS personnel will review the contents of the telemetry dump after the procedure has been run.

**Restrictions/Warnings/Notes:**

This assumes that DPA-A and/or DPA-B is on. ACIS should not be receiving any other concurrent commanding. Spacecraft telemetry should be in Format 2. Once the successful EEPROM dump has started, loss of telemetry is OK. Contents of the EEPROM dump can be examined at a later time.

**Yes ☐ No ☒ 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: 056:17:00Z to 056:18:00Z
CAP duration: 30 minutes
CAP verified against FEB2216B daily loads if applicable: N/A ☐

**Yes** ☒ **No** ☐ Daily load commands exist during execution window of CAP
**Yes** ☒ **No** ☐ CAP requires specific DSN comm. or timing requirements
**Yes** ☐ **No** ☒ CAP will be run concurrently with another CAP
**Yes** ☐ **No** ☒ CAP requires commanding in the load to be executed to ensure success
**Yes** ☐ **No** ☒ Daily load requires the CAP to be completed to ensure success
**Yes** ☒ **No** ☐ CAP uses SCS slots. If yes, performs SCS cleanup

**Comments:** CAP requires that ACIS science is idle and ACIS is not receiving any other concurrent commanding. CAP uses SCS-135 and includes steps to disable and clear SCS-135.

**Initial Conditions/Spacecraft Configuration:**

CAP assumes that DPA-A and/or DPA-B is on and ACIS flight S/W is running patch F-G-H (version 53).

**CAP depends upon or changes the state of:**

☒ Telemetry Format
☐ 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
☐ HRC Configuration
☒ SCS States or Contents
☐ Dither State
☐ FSW Element

**Comments:**

The TLM FMT will be changed to FMT 2 by this CAP if necessary.

CAP will be executed when ACIS science is idle, such as during a perigee passage.

The commands in the CAP require ACIS flight software to be running patch level F-G-H (version 53).

**Risk/Comm. Loss/Worst Case Scenario:**

**What happens if comm. is lost during CAP execution?**
If comm. is lost during CAP execution, there is no adverse effect. Depending on which step has been completed, some of the diagnostic information could be lost. If comm. is lost before step 11, the SCS slot will need to be cleared at a later comm. If comm. is lost after the last command but before the EEPROM dump can complete, the data can be examined at a later time.

**What is the worst case scenario for CAP execution? (Assuming the CAP is executed correctly)**
If the results of step 7 are not as expected, this may indicate the EEPROM is corrupted. Skip to step 11, to clear the SCS slot, and end the CAP.
If there is an unanticipated problem with the eeprom_cksum routine, the BEP could crash. Recovery would require SOP_ACIS_WARMBOOT_HKP.

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

| Product Name | Version | On-Console |
|---|---|---|
| O_SCSCTRL.SSC | V3.4 | ☒ |
| C_SET_FORMAT.SSC | V3.3 | ☒ |
| F_MAIN.dsp [EHS] | V3.11 | ☒ |
| O_MISS_SCS_STATUS.dsp [EHS] | V3.4 | ☒ |

| Command Load Name | Checksum (if applicable) | In ODB |
|---|---|---|
| 1A_EEPCK_LD_135.cld | D33B3B4 | ☒ |
| 1A_EEPCK_EX_135.cld | 01B24F4 | ☒ |
| 1A_EEPCK_FL_135.cld | 942C056 | ☒ |

**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 SOT verify current ACIS status
   ACIS science is idle (1STAT1ST = 1)
   ACIS telemetry buffers are clear (1STAT7ST = 0)
   ACIS flight SW is running version 53

3. Uplink Load: 1A_EEPCK_LD_135.CLD
   CHECKSUM = [D33B3B4]

4. Enable and Activate SCS-135
   Use script O_SCSCTRL with inputs ENABACTI and 135
   Verifier on display O_MISS_SCS_STATUS.dsp
   Contents of the load are:
   WBEEPCKSUM (command ID = 14415)

5. Uplink Load: 1A_EEPCK_EX_135.CLD
   CHECKSUM=[01B24F4]

6. Activate SCS-135

Use script O_SCSCTRL with inputs ACTI and 135
Verifier on display O_MISS_SCS_STATUS.dsp
Contents of the load are:
XBEEPCKSUM (command ID = 14417)
RBROMDUMP1 (command ID = 306)

7. ACIS confirms RBROMDUMP1 command fails, as expected (cmdResult = 3)
   bepExecuteReply = 0x8e9fdcc0
   EEPROM contents are not dumped
   If results are not as expected, skip to step 11.

8. Uplink Load: 1A_EEPCK_FL_135.CLD
   CHECKSUM=[942C056]

9. Activate SCS-135
   Use script O_SCSCTRL with inputs ACTI and 135
   Verifier on display O_MISS_SCS_STATUS.dsp
   Contents of the load are:
   XBEEPBOGUS (command ID = 14427)
   RBROMDUMP1 (command ID = 306)

10. ACIS confirms RBROMDUMP1 command succeeds (cmdResult = 1)
    bepExecuteReply = 0x8e9fdcc0
    EEPROM dump has started

11. Clear and disable SCS-135
    Use script O_SCSCTRL with inputs CLEAR and 135

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