

STEREO IMPACT

PROBLEM REPORT

PR-2015

SEP Commanding

8/17/2005

PR Numbers: 1xxx=UCB, 2xxx=Caltech/JPL, 3xxx=UMd, 4xxx=GSFC/SEP, 5xxx=GSFC/Mag,
6xxx=CESR, 7xxx=Keil, 8xxx=ESTEC, 9xxx=MPAe

Assembly: SEP	SubAssembly: SEP Central
Component/Part Number:	Serial Number: FM2
Originator: David Curtis	Organization: U.C.Berkeley
Phone: (510) 642-5998	Email: dwc@ssl.berkeley.edu

Failure Occurred During (Check one)

Functional test Qualification test S/C Integration Launch operations

Environment when failure occurred:

Ambient Vibration Shock Acoustic
 Thermal Vacuum Thermal-Vacuum EMI/EMC

Problem Description

During integration of the FM2 SEP suite onto the B spacecraft the unit was powered on (first IDPU, then SEP). We got the correct SEP boot message in telemetry (with the correct memory checksum values) and subsequent housekeeping data looked nominal. However, when we tried to command it we got no command verification from SEP. Commands were verified to be getting as far as the IDPU, and were presumably passed on to SEP, but SEP was not responding with command verification packets. Also there was no other sign in telemetry or power consumption that would indicate the commands were executed. The IDPU showed one error message indicating a mis-formatted telemetry message from SEP at power on, but no other errors. The IDPU telemetry indicated SEP was on and enabled and SEP commands were being forwarded.

Analyses Performed to Determine Cause

A SEP reset command (code 0x0000, reset from EEPROM) was issued from the IMPACT GSE. This causes the IDPU to send a command to SEP (over the same serial interface used by other SEP commands) that is decoded by the SEP hardware (independent of SEP software). This worked, causing the system to re-boot. Subsequent commands to SEP worked fine. This problem was not repeated on subsequent power cycling, nor was it seen in previous instrument stand-alone tests.

It is not clear if the IDPU error message is related to the commanding problem. It might point to a problem with the relative timing on the SEP power-up and enabling of the IDPU to SEP interface that could cause a timing glitch on the command and data lines, perhaps confusing the SEP command logic in hardware or software. It might also be related to the breakout boxes which were installed on various harnesses for this test.

Corrective Action/ Resolution

Rework Repair Use As Is Scrap

If this problem occurs on orbit it can easily be recovered from (by sending a SEP reset). Currently no further action is planned. Since the removal of the breakout boxes and integration onto the observatory this issue has not occurred again. The IMPACT suite has completed CPTs, and functional testing with the IDPU on both observatories and there have been no issues.

Date Action Taken: ___n/a___ **Retest Results:** ___n/a_

Corrective Action Required/Performed on other Units Serial Number(s)

Closure Approvals

Subsystem Lead:	_____	Date: _____
IMPACT Project Manager:	_____	Date: _____
IMPACT QA:	_____	Date: _____
NASA IMPACT Instrument Manager:	_____	Date: _____