

STEREO IMPACT

PROBLEM REPORT

PR-2008

SEP HK Readout

5/19/2005

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: FM1
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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 thermal balance testing at -22C the SEP FM1 the housekeeping readings on the 2.6D and 3.4D were anomalous and could be induced simply by turning on the high voltage. If the instrument had just been powered up, then the spurious readings would appear if the HV was turned on and would go back to normal after the HV was turned back off. Normally after SEP is powered on the ALLON1 command is used to boot the instruments and turn on the HV. The spurious housekeeping readings did appear after ALLON1 as would be expected since the HV comes on. However, in this case when the HV was turned off the spurious readings were not entirely cured, but went most of the way back to the correct readings. Measurements taken through the BOB in place indicated that the measured voltages were ok.

Perhaps this was not caught during thermal testing at Space Instruments since most of the LM108s powered by -6VF are in the HV supply. The problem might only manifest if the HV supply and analog board are tested together. This is the first time thermal testing in with the boards together.

Analyses Performed to Determine Cause

After inspection of the schematics the above symptoms appear to be caused by too large of a resistor (1K) in the filter which creates "-6VF". The "-6VF" net supplies power to 6 LM108 pamps which each have a nominal draw of 0.3 mA, increasing to about 0.4 mA at -20 C yielding a 2.4 volts nominal drop across the 1K filter resistor (far too large). The "-6VF" net also supplies the negative power to the multiplexor chips and it is this fact which very likely accounts for the spurious housekeeping readings. Presumably, turning on the HV causes more current draw for some of the LM108s in the HV supply and causes the problem to show up.

Corrective Action/ Resolution

Rework ✓ Repair Use As Is Scrap

1. Replaced the (Ref Designator) (part #, s/n, LDC) with (part #, s/n, LDC)
2. Updated (red-lined) schematics.
3. Retested SEP Central and Bias Supply FM1 at -10 C and rebooted LET 100 times. During this time LET, SEP Central and the Bias Supply was observed. LET, SEP Central and the Bias Supply all worked nominally. The HK fix works as expected. The instrument wasn't able to get colder than -10 C due to the insulation provided by bagging and purging. (Reference PFR 2008, 2009, 2010, 2011)
4. No further retest is required for the rework. Thermal vacuum test will be performed as planned along with a 3-axis vibe retest. (Reference PFR 2006, 2007).

Date Action Taken: 5/27/2005 **Retest Results:** 5/28/2005 thermal cold test successful.

Corrective Action Required/Performed on other Units ✓ Serial Number(s): FM2 requires the same fix as described above. CLOSE AFTER THE THERMAL VACUUM TESTS ARE COMPLETED.

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Closure Approvals

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