

STEREO IMPACT

PROBLEM REPORT

PR-4005

HET Detectors

4/7/2005

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: HET FM1/FM2
Component/Part Number: H1/H3 detector	Serial Number: L1-40
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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

After acoustic testing on the FM1 and FM2 SEP/HET/LET the leakage currents on HET FM1 H1-08, H3-08, H3-39 and HET FM2 H3-18, H3-19 are showing signs of leakage current growth.

Analyses Performed to Determine Cause

Assessing the leakage currents on the detectors were complicated by the engineering conversions This prompted a review of the circuitry and the assumptions made to calculate the leakage currents. The results of the analysis can be found on the following pages.

Corrective Action/ Resolution

Rework Repair Use As Is Scrap

Since the flight instrument was already disassembled for PFR 2006 and PFR 2007 the following detectors were replaced and/or switched positions in an effort to achieve the best performance of the available detectors: (reference a complete table on the next page)

- 1) HET FM1 H1 position from S/N H1-08 to S/N H1-31
- 2) HET FM1 H2 position from S/N H1-12 to S/N H1-32
- 3) HET FM1 H3a position from S/N/ H3-08 to S/N H3-50
- 4) HET FM1 H4b position from S/N H3-41 to S/N H3-62.
- 5) HET FM1 H5a position from S/N H3-33 to S/N H3-59
- 6) HET FM1 H5b position from S/N H3-50 to S/N H3-63
- 7) HET FM2 H2 position from S/N H1-09 to S/N H1-34
- 8) HET FM2 H3a position from S/N H3-18 to H3-44
- 9) HET FM2 H3b position from S/N H3-19 to H3-41
- 10) HET FM2 H5b position from S/N H3-44 to H3-33

Functional testing and additional thermal vacuum retesting successfully completed after reassembly. Reference thermal vacuum testing and vibration retest (per PFR 2006, PFR 2007). Additional HET detector spares were ordered from Micron.

Date Action Taken: __6/14/2005 **Retest Results:** __successful

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

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Closure Approvals

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

STEREO HET Telescopes

Tycho

13-Jun-05

Sandy Shuman to leave tonight for Caltech carrying spare detectors to make the following changes:

Red type indicates a replacement detector.

FM1

Position	Current Detector	Single or Double Oxide?	Leakage Current	Proposed Detector	Single or Double Oxide?
H1	H1-31	Single	OK	H1-31	Single
H2	H1-12	Double	OK	H1-32	Single
H3a	H3-50	Single	OK	H3-50	Single
H3b	H3-39	Single	OK	H3-39	Single
H4a	H3-40	Single	OK	H3-40	Single
H4b	H3-18	Double	H4 current is high	H3-62	Single
H5a	H3-19	Double	H5 current is high	H3-59	Single
H5b	H3-08	Double	H5 current is high	H3-63	Single
H6	H3-43	Single	OK	H3-43	Single

Problem: High H4 and H5 leakage currents;
H2 detector is of double oxide type (at risk for large leakage current growth)

FM2

Position	Current Detector	Single or Double Oxide?	Leakage Current
H1	H1-33	Single	OK
H2	H1-34	Single	OK
H3a	H3-44	Single	OK
H3b	H3-41	Single	OK
H4a	H3-52	Single	OK

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H4b	H3-54	Single	OK
H5a	H3-51	Single	OK
H5b	H3-33	Single	OK
H6	H3-47	Single	OK

No changes to be made to FM2.