

STEREO IMPACT

PROBLEM REPORT

PR-1031

FM2 IDPU Cold Start

2004-12-28

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

Assembly : IDPU	SubAssembly :
Component/Part Number:	Serial Number: FM2
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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 IDPU FM2 Thermal Vac, the first operational cold cycle, the IDPU did not start up correctly on power-up. It had worked fine on the first hot soak CPT. IDPU FM1 has passed thermal vac with no such problem. The processor and digital interfaces to remote instruments seem to function correctly, but the two internal instruments (MAG and STE-U) produced no messages, and the primary bus current was significantly low. Multiple attempts were made at start-up over the full range of primary bus voltages with no effect.

Analyses Performed to Determine Cause

The harness from the IDPU to STE-U preamp was disconnected and monitored during a power-on attempt while cold. It was found that the analog supplies provided to the preamp were zero, indicating a problem with the analog power converter.

The instrument was warmed up and periodically power was applied. The instrument failed to start at external TC temperatures up to +30C, but started at external TC temperature of +40C. After starting the internal temperature was measured at +21C (this cannot be read unless STE-U starts correctly). The test was repeated in a thermal chamber with the same result. The MAG and STE-U instruments don't start below -9C.

The power converter was disassembled from the rest of the IDPU for test. It was found that when Q7 is cold, the supply does not start, but if the converter is turned on with Q7 warm and then it is cooled the circuit continues to function. Q7 is related to the over-current system. Further inspection shows R42 is missing. Without R42, the base of Q7 floats, and start-up is indeterminate. The resistor was installed and tested. The system was tested in a thermal chamber down to the cold operational limit and worked OK.

The circuit was not stressed by the missing resistor. The over-current system was not working at higher temperatures, but was not needed. The system was simply off at low temperatures.

Corrective Action/ Resolution

Rework Repair Use As Is Scrap
Install R42 and retest (Thermal vac is repeated starting at the first operational cycle). Verify R42 was correctly installed in FM1. The drawing is correct.

Date Action Taken: 2004-12-28 **Retest Results:** Success/bench level test

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

Closure Approvals

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