STEREO
IMPACT

Boom Suite Aliveness Test Procedure

IMPACT-BOOM-Aliveness_B.doc
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Date Run:_____

Test Reference:_____

Document Revision Record

Rev.	Date	Description of Change	Approved By
A	2005-Jun-23	Preliminary Draft	-
B	2006-Feb-28	Minor additions – Instrument enable i/f for SWEA and SEP and mod for new software load v30, v31. LR	

Distribution List

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1. Overview

1.1. *Introduction*

The STEREO IMPACT Boom Suite consists of the Instrument Data Processing Unit (IDPU) plus the boom-mounted instruments (SWEA, STE-D, STE-U, and MAG). The IDPU if the single point interface between these instruments and the STEREO spacecraft for telemetry. The IDPU also interfaces to the SEP Suite and PLASTIC instruments. Testing for those instruments is described elsewhere.

This document describes the Aliveness Test to be performed on the Boom Suite during testing to ensure the hardware is performing correctly. It is a minimum subset of the Comprehensive Performance Test (CPT), designed to verify the hardware is connected and functional.

1.2. *Document Conventions*

In this document, TBD (To Be Determined) means that no data currently exists. A value followed by TBR (To Be Resolved) means that this value is preliminary. In either case, the value is typically followed by a code such as UCB indicating who is responsible for providing the data, and a unique reference number.

Commands to be typed into the C&T GSE (stgsect) are indicated as follows: */SystemNOP.* After typing the command hit the Enter key to send.

1.3. *Applicable Documents*

The following documents are closely interrelated with this specification. All documents can be found on the Berkeley STEREO/IMPACT FTP site unless otherwise indicated:

http://sprg.ssl.berkeley.edu/impact/dwc/

1. 7381-9012B (IMPACT/Spacecraft ICD, on the APL web page)
2. ICD/IMPACTSerialInterfaceG (instrument interface spec)
3. ICD/IMPACT_CTM_P (command & telemetry database)

2. Test Setup

This test assumes the boom suite is integrated to the spacecraft.

2.1. *Test Equipment*

1. IDPU Serial number_____.
    Configuration issues:_____
2. PROM version number:_____, Date: _____
3. EEPROM code version number:_____, Date:_____
4. Command & Telemetry GSE connected to spacecraft emulator via TCP/IP
    C&T GSE version date_____
    C&T Database version:_____, Date:_____
5. MAG Sensor (ETU, FM1, FM2, none):_____
6. STE-U Preamp/Sensor (ETU/FM1/FM2):_____
7. Boom harness (ETU/FM1/FM2)_____
8. SWEA/STE-D Sensor/simulator (ETU/FM1/FM2/Sim)_____
9. SWEA HV Enable Plug Type (Red/Green/None)_____
    NOTE: MCP HV should not be enabled except in vacuum.
10. SEP sensor/simulator (ETU/FM1/FM2/None)_____
11. PLASTIC sensor/simulator (ETU/FM1/FM2/None)_____

2.2. *Startup GSE*

1. Verify spacecraft is powered and functioning, and MOC is ready for POC to connect.   Verify_____
2. Start up SSH and connect to the MOC
3. Power up C&T GSE PC and start C&T GSE software (stgsect).
4. Select the PROM display from the C&T GSE Display/Recall Display menu
5. Connect C&T GSE to MOC for telemetry – push the button next to the TLM display on the Received Data Panel:
    Verify the TLM light comes on:_____
6. Connect C&T GSE to MOC for commands – push the button next to the CMD display on the Received Data Panel:
    Verify the TLM light comes on:_____
7. On the C&T GSE push the Record button. Determine the name of the telemetry file (in the scgse\log directory)
    File Name:_____
8. Enable the stgse Telemetry Server.
9. Startup the MAG, STE, and SWEA science displays. Connect each to the server. Verify the connect lights come on.
    Verify_____

3. Power-up Boom Suite

Record Start Time_____

┌───┐
│ **DO NOT POWER ON THE IDPU OR MAG HEATER CIRCUIT**   │
│ **WITHOUT THE MAG SENSOR CONNECTED.**   │
└───┘

3.1. *Power-up IDPU*

1. Request that the spacecraft operator power-on the power service to the IDPU.
2. **WITHIN 10 SECONDS OF POWER-ON** send the following command: */SetBoot 3* (You can send this command after you see the first telemetry packet.)
   The latest flight software version is currently stored in EEPROM 3. This command will change the flight software version to V30/P3.1.1 on S/C-A or V31/P3.1.1 on S/C-B.
3. If the supply current limit is reached, ask the spacecraft operator to power off the IDPU immediately.

Bus Supply Voltage_____V
IDPU Supply current _____mA

4. Verify C&T GSE is getting telemetry. On IDPU SOH panel, UTC time should correspond to spacecraft time (typically set to UTC), and should be incrementing every two seconds.

Verify C&T GSE getting telemetry _____

5. After 10 seconds ISoftwareVersion should change to correspond to the EEPROM software version number. Verify no errors are reported and the version changes

** Record value of ISoftwareVersion
(30 for S/C A) (31 for S/C B)_____
Record value of IERRORCount _____
Record value of IBootSelect _____
Verify that MAG and STE-U InterfaceActive bits are set_____

** (If the ISoftwareVersion is not correct then the /SetBoot 3 command did not get in on time. Send the following commands to load the latest software version – note: these need to be sent within 10 seconds of each other.)

/Restarttopage 0
/SetBoot 3

3.2. *Power-up SWEA*

1. Record the SWEA enable connector used in SWEA-J2.

SWEA Enable_____

DO NOT POWER ON SWEA WITH THE MCP HV ENABLED (Green-tag enable in place) EXCEPT IN VACUUM, P < 1E-5 TORR. POWERING ON WITH THE ENABLE PLUG IN, WHILE STILL PROTECTTED BY THE ENABLE COMMAND, IS RISKY.

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2. Request that the spacecraft operator power-on the power service to the SWEA.

3. After the SWEA service is powered on enable the SWEA interface. Send the command, */SWEAEnableIF*. If the supply current limit is reached, power off the supply immediately.

SWEA Supply current _____mA

4. Verify that on the C&T GSE ISCStatus display the SWEA Power display shows On (1), and on the Interface Active display, SWEAInterface shows active (1).

Verify_____

3.3. ***Power-up MAG Heater***

1. Request that the spacecraft operator power-on the power service to the MAG Heater. If the supply current limit is reached, power off the supply immediately.

Mag Heater Supply current _____mA

2. Record the MAG temperature on the C&T GSE:

IMAGTemp_____C

3. If an GSE temperature sensor is available, record the GSE mag temperature:

GSE MAG Temp_____C

4. Record the telemetry MAG heater current (note that this is not expected to be an accurate measure of the actual current, but should correspond to the measurement made above to ~20%). The MAG heater will not come on above 10C, but will take a ~5mA standby current.

IMAGHeater_____mA

4. Configure for Aliveness Test

The instruments mostly come in a good default mode for aliveness tests. Send the following commands to adjust the default state for Aliveness tests and then collect data for a few minutes.

1. Set STE to hi res door monitor mode. ***Start STEDoorLUT***. On the SWEA/STE-D SOH page verify that the ISTEModeID changes from 0 to 6 (may take a minute).

    Verify_____

2. Turn on the SWEA test pulser using the command ***/SWEAPulserEnable.*** Verify that the ENBSWEATP bit goes on (1) in the ISWEASTEDDig display on the C&T GSE.

    Verify_____

3. Verify the IDPU SOH data looks nominal

    Verify_____

4. Verify the MAG science display data looks nominal.
    Enable the MAG Chart on the MAG GSE. If the value is saturated (typically 1, sometimes 32768), send the command ***/MAGEnableIF***, which should get it out of saturation.

    Verify_____

5. Verify the STE science display data looks nominal

    Verify_____

6. Verify the SWEA science display data looks nominal

    Verify_____

Leave the instruments on and in this mode for at least a few minutes, as long as possible. SEP and PLASTIC aliveness tests can proceed in parallel with boom suite instrument data accumulation.

5. Turn on SEP

The spacecraft supplies the 28V power to SEP Central and SEPT. An instrument command from the SEP GSE will turn on HET, LET and SIT.

1. Request that the spacecraft operator power-on the power service to the SEP/SEPT2 service. If the supply current limit is reached, power off the supply immediately.

    IM_SEP_SEPT2_PWR_CUR _____mA

2. Immediately after SEP/SEPT2 power-on send the command ***/SEPEnableIF*** to enable the SEP interface. (If this command is sent in a timely manner the SEP GSE will receive the power on checkums in their telemetry. If not, the ***RCHKS.*** and ***PCHKS.*** commands will need to be sent from the **SEP GSE**.)

3. Verify that on the C&T GSE ISCStatus display the SEP Power display shows On (1), and on the Interface Active display, SWEAInterface shows active (1).

    Verify_____

6. Power Off Boom Suite

After running in Aliveness test mode for at least a few minutes, the instrument can be powered off.

1. Request that the spacecraft operator power-off the power service to the MAG Heater. Verify that IMAGHeater returns to a low level

<div align="right">

Mag Heater Supply current _____mA

IMAGHeater_____mA

</div>

2. Request that the spacecraft operator power-off the power service to SWEA/STE-D. Verify that SWEA/STE-D current turns off

<div align="right">

SWEA/STE-D Supply current _____mA

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2. Verify that on the C&T GSE ISCStatus display the SWEA Power display shows Off (0), and on the Interface Active display, SWEAInterface shows inactive (0).

<div align="right">

Verify_____

</div>

3. Verify PLASTIC and SEP instruments are powered off

<div align="right">

Verify_____

</div>

3. Request that the spacecraft operator power-off the power service to the IDPU. Verify that IMPACT telemetry stops and the IDPU current turns off

<div align="right">

IDPU Supply current _____mA

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