



# HESSI SPACECRAFT EMC TEST

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## 1. INTRODUCTION

### 1.1 Purpose

This document establishes the EMC test procedure to be performed on the HESSI Spacecraft. This testing is performed to verify compatibility of the HESSI spacecraft with the Pegasus launch vehicle and launch sites (VAFB and KSC). Testing will be performed in launch configuration with most of the bus powered off.

### 1.2 Scope

This procedure will be performed during qualification testing of the spacecraft at JPL.

### 1.3 Applicable Documents

1. HESSI EMC Test Procedure, JPL document TP518197
2. Mil-Std-462
3. HESSI Spacecraft Power ON/OFF Procedure, Spectrum Astro document 1110-EP-W15998

## 2. Radiated Emissions

### 2.1 Setup

- a. The HESSI spacecraft shall be setup in the EMC screen room. The bus chassis shall be grounded to the screen room ground via ground straps to the cart. The room shall be configured as shown in TP518197 section 3.4. The antennas should point at the SEM.
- b. The spectrometer pump shall be in the screen room, but disconnected from the bus and from power during the test.
- c. The bus shall be configured as per HESSI Spacecraft Power ON/OFF Procedure, Spectrum Astro document 1110-EP-W15998, section 5 (Umbilical power).
- d. The Umbilical and TAC connectors shall be mated and fed through the screen room wall to the EGSE using foil over-shield attached to the shield room ground.
- e. The battery cooler shall be outside the screen room, with cooling ducted through the wall.
- f. The FEP, HV enable, and Actuator Enable plugs shall be installed in the spacecraft.

### 2.2 TEST PROCEDURE

- a. Take ambient RE02 measurements as required with the bus off. Verify that the background levels are acceptable.
- b. Power up the spacecraft using 1110-EP-W15998, section 5 via the Launch Vehicle Interface. Do not start the spacecraft CPU.
- c. Adjust the TAC voltage to null the battery current.
- d. Install the BFP.
- e. Adjust the TAC voltage to trickle-charge at 0.8 amp into the battery, maximum TAC voltage 36V. During the test, adjust the TAC voltage as required to maintain 0.8A +/- 0.1A subject to the maximum TAC voltage of 36V.
- f. Start the RE02 test per TP518197 section 3.6

- g. Monitor SOH telemetry via TAC Record the starting value and any significant changes.

Item	Telemetry Point	Starting Value	Changes
1.	Batt Voltage		
2.	Batt Mid Volt		
3.	Batt Current		
4.	Batt Temp1		
5.	Batt Temp2		
6.	Batt Chassis Temp		
7.	CCB MsnMode1		
8.	CCB MsnMode2		
9.	LV Sep Stat1		
10.	LV Sep Stat2		
11.	LV Sep Stat3		
12.	Xmtr Status		
13.	CPU Status		
14.	ESS Bus Curr		
15.	SEM Temp		

- h. If time permits, perform RE01 test per TP518197 section TBD.
- i. After the test, power-down the spacecraft using 1110-EP-W15998

### 3. Radiated Susceptibility

#### 3.1 Setup

- a. The HESSI spacecraft shall be setup in the EMC screen room. The bus chassis shall be grounded to the screen room ground via ground straps to the cart. The room shall be configured as shown in TP518197 section 4.4. The antennas should point at the SEM.
- b. The spectrometer pump shall be in the screen room, but disconnected from the bus and from power during the test.
- c. The bus shall be configured as per HESSI Spacecraft Power ON/OFF Procedure, Spectrum Astro document 1110-EP-W15998, section 5 (Umbilical power).
- d. The Umbilical and TAC connectors shall be mated and fed through the screen room wall to the EGSE using foil over-shield attached to the shield room ground.
- e. The Solar Array Deployment Simulator GSE shall be harnessed to the bus so that the actuator current can be monitored. The GSE shall be outside the shield room. The harness shall be foil-shielded as required.
- f. The battery cooler shall be outside the screen room, with cooling ducted through the wall.
- g. The FEP, HV enable, and Actuator Enable plugs shall be installed in the spacecraft.

**3.2 TEST PROCEDURE**

- a. Power up the spacecraft using 1110-EP-W15998, section 5 via the Launch Vehicle Interface. Do not start the spacecraft CPU.
- b. Adjust the TAC voltage to null the battery current.
- c. Install the BFP.
- d. Adjust the TAC voltage to trickle-charge at 0.8 amp into the battery, maximum TAC voltage 36V. During the test, adjust the TAC voltage as required to maintain 0.8A +/- 0.1A subject to the maximum TAC voltage of 36V.
- e. Start the RS01 test per TP518197 section 4.6
- f. Monitor the Solar Array Deployment Simulator GSE display. Record any positive indications; include the test time and status (frequency) at the time of the change.
- g. Monitor SOH telemetry via TAC. Record the starting value and any significant changes; include the test time and status (frequency) at the time of the change.

Item	Telemetry Point	Starting Value	Changes
1.	Batt Voltage		
2.	Batt Mid Volt		
3.	Batt Current		
4.	Batt Temp1		
5.	Batt Temp2		
6.	Batt Chassis Temp		
7.	CCB MsnMode1		
8.	CCB MsnMode2		
9.	LV Sep Stat1		
10.	LV Sep Stat2		
11.	LV Sep Stat3		
12.	Xmtr Status		
13.	CPU Status		
14.	ESS Bus Curr		
15.	SEM Temp		

- h. After the test, power-down the spacecraft using 1110-EP-W15998

**3.3 Post-RS Testing**

Perform a post-RS functional test of the spacecraft and instrument.