

STEREO Impact Boom FM Stiffness Test Report

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Revision: -

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1. OVERVIEW

The STEREO Boom stiffness measurements for the Flight Model (1 and 2) Booms were conducted May 26 through September 13, 2004 at the Space Sciences Laboratory in Berkeley, California using the STEREO IMPACT Boom Thermal Vacuum Chamber and its associate gantry for g negation. Robert Ullrich, Lancelot Braasch, Dave Curtis and Jeremy McCauley were in attendance for instrument handling, verification and test observation.

Stiffness testing was conducted on the Booms (See Figure 1) following each deployment to verify full deployment and characterize the deployed Boom. A total of four deployments have been performed with each Boom (one tuning, one functional, one hot thermal vacuum, and one cold thermal vacuum deployment). An accelerometer was attached to the SWEA Mass Dummy and the Boom was excited by providing it with a small deflection in the XY or XZ plane. The acceleration of the Boom was recorded and then processed to get the fundamental frequency.

All stiffness tests passed the criteria of having a fundamental frequency different from that of the spacecraft solar arrays (0.5 Hz). Final frequency numbers, as listed below, have been forwarded to Terry Betenbaugh for Spacecraft analysis.

2. REFERENCE DOCUMENTS:

APL Document APL 7381-9003 Rev A –
STEREO Environment Definition,
Observatory and Instrument Test
Requirements Document

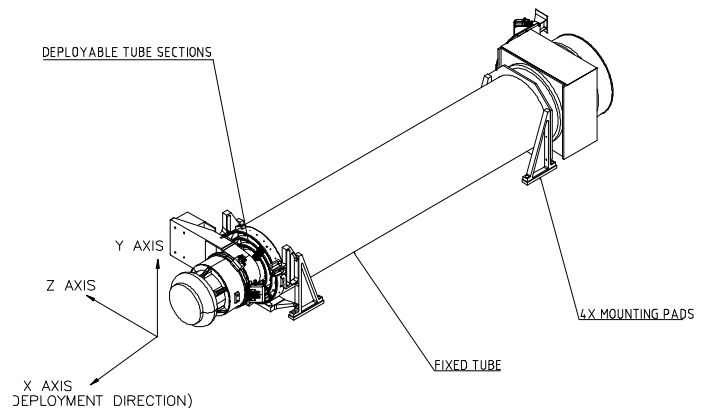


Figure 1: Definition of Axes

3. STIFFNESS MEASUREMENTS (Measurements in Hertz)

Fundamental Frequency (Hertz)		
Plane:	XY	XZ
FM2 Cold	1.81	2.01
FM2 Hot	1.64	2.00
FM2 PreVibe	1.72	2.06
FM1 Cold	1.90	2.05
FM1 Hot	1.87	2.13
FM1 PreVibe	1.82	2.11
Average	1.79	2.06
STDEV	0.10	0.05