

STEREO *IMPACT*

Boom Magnetics Test Report

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Distribution List

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1. Overview

1.1. *Introduction*

The IMPACT Boom is a deployable mast that carries the SWEA, STE-D, STE-U and MAG sensor. After launch it will be deployed to separate the spacecraft from the MAG sensor (to reduce the measured spacecraft magnetic background) and the SWEA/STE-D instrument (to clear its field of view). The sensors were magnetically screened separately and are documented elsewhere.

This document describes the results of the magnetics testing performed on the Flight Boom units (both FM1 and FM2), excluding the instruments (MAG sensor, STE-U and SWEA/STE-D) which will be tested separately. This testing was performed at U.C. Berkeley. .

1.2. *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. APL Document APL 7381-9003 Rev A – STEREO Environment Definition, Observatory and Instrument (on APL web site)

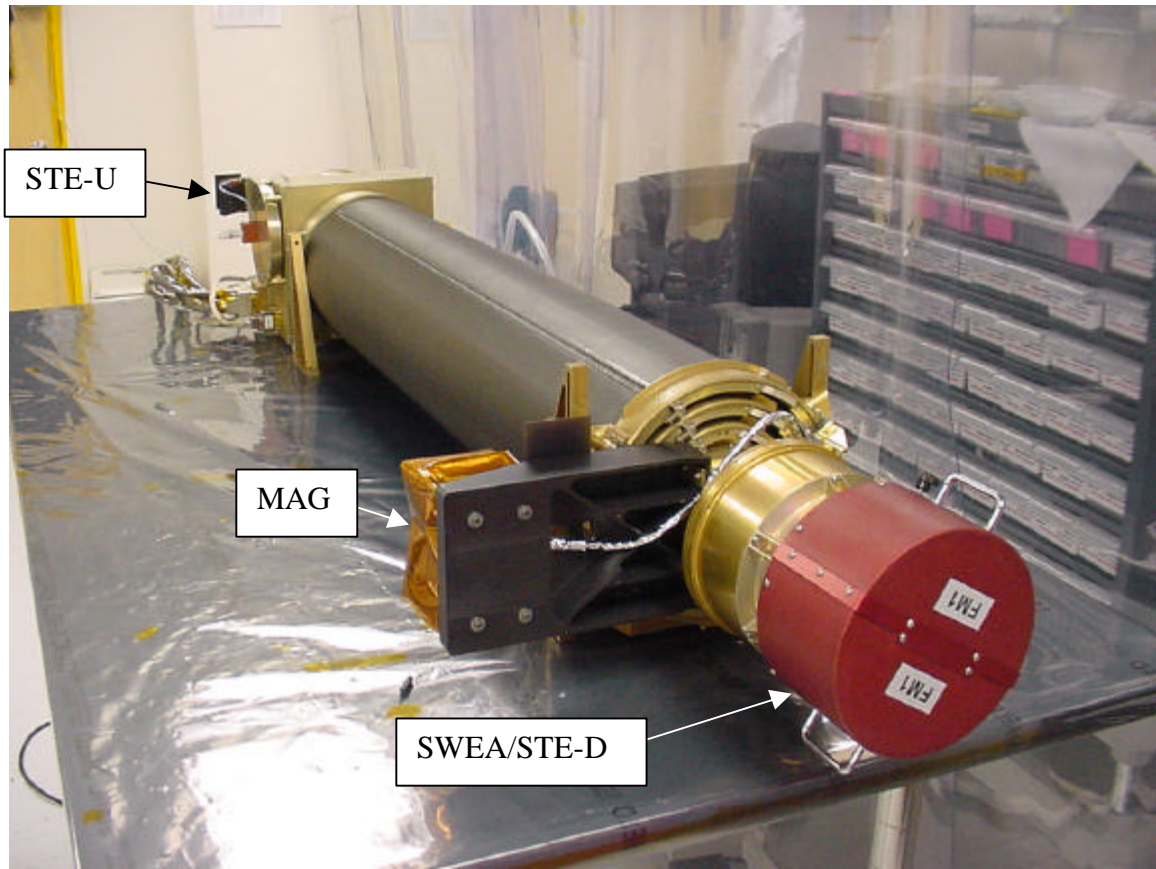


Fig 1. FM1 IMPACT Boom (stowed)

2. Test Description

As the boom is close to the MAG sensor, special precautions were taken to ensure it does not impact the sensor measurement adversely. Most of the parts of the boom are non-magnetic by design.

A magnetics screening station was provided by the MAG team, consisting of a mag sensor in a shield can. The test item is placed in the shield can, ~1" from the sensor. Each piece of the boom was screened before the boom was assembled, and any part that had a significant field (anything producing a detectable field which will be located within 1m of the MAG when the boom is deployed, more than a few nT for parts located further away) was identified and discussed with the MAG team.

On April 13 2004, prior to final boom assembly, items identified with significant field were then measured by rotating the item with a Meda uMag sensor 5" away and determining the maximum peak-to-peak field variation.

Unit	p-p Field @ 5"	Distance from MAG Sensor (deployed)
Brake Assy	100nT	4m
Pin-puller Assy	100nT	4m

3. Analysis

100nT at 5", falling off as r^3 results in a field at the MAG sensor of .003nT, compared to a spacecraft goal of 1nT.

The MAG team has declared this an acceptable level.