MET Laboratories, Inc. *Safety Certification - EMI - Telecom Environmental Simulation*
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Vibration and Shock Testing

for the

Optima EPS Corporation
Rack (70” x 19’W x 36”L, 500 lbs - 750 lbs)

Tested Under
Customer Purchase Order #50460
and
MIL-STD-810F

MET Report: ESL19436-GEN

April 17, 2006

Prepared For:

Optima EPS Corporation
2166 Mountain Industrial Blvd
Tucker, GA 30084

Prepared By:
MET Laboratories, Inc.
914 West Patapsco Avenue
Baltimore, Maryland 21230

Test Report
for the

Optima EPS Corporation
Rack (70” x 19’W x 36”L, 500 lbs - 750 lbs)

Tested Under

Customer Purchase Order #50460
and
MIL-STD-810F

Testing Performed By:

Hadid Jones
Test Engineer

Report Prepared By:

Molly Sunderland
Documentation Department

Lab Manager

Todd Talbot
Environmental Lab

Report Status Sheet

Revision	Report Date	Reason for Revision
∅	April 17, 2006	Initial Issue.

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I. Executive Summary

MET Laboratories, Inc. was contracted by Optima EPS Corporation to perform acceptance testing to MIL-STD-810F criteria on the Rack (70” x 19’W x 36”L, 500 lbs - 750 lbs) under the Optima EPS Corporation purchase order number 50460.

The tests were based on MIL-STD-810F. The results obtained relate only to the item(s) tested.

Vibration Test Methods

The EUT was subjected to a vibration test in accordance with the procedures of MIL-STD-810F. The visual inspection of the EUT revealed the EUT was **compliant** with the requirement after minor adjustments were made. (see vibrations section for details).

Shock Test Methods

The EUT was subjected to a shock test in accordance with MIL-STD-810F. The visual inspection of the EUT revealed the EUT was **compliant** with the requirement(s). No anomalies noted.

II. Equipment Configuration

A. Overview

This document describes the test setups, test methods, required test equipment, and the test limit criteria used to perform an Acceptance Test of the Optima EPS Corporation, Rack (70” x 19’W x 36”L, 500 lbs - 750 lbs). The tests were based on MIL-STD-810F. The tests described in this document were formal tests as described with the objective of the testing was to verify compliance of the Equipment Under Test (EUT) to the requirements of the aforementioned specifications.

Model(s) Tested:	Rack (70” x 19’W x 36”L, 500 lbs - 750 lbs)
Model(s) Covered:	Rack (70” x 19’W x 36”L, 500 lbs - 750 lbs)
Cabinet Load	90 lbs per shelf (540 lbs total)
Specifications:	Primary Power: N/A
	Secondary Power: N/A
Analysis:	The results obtained relate only to the item(s) tested.
Lab Environmental Test Conditions:	Temperature: 15-35º C
	Relative Humidity: 30-60%
	Barometric Pressure: 860-1060 mbar
Evaluated by:	Hadid Jones
Date:	April 17, 2006

B. References

ISO 1012-1: 1992 (E)	Quality Assurance Requirements for Measuring Equipment
MIL-STD-810F	Department of Defense Test Method Standard for Environmental Engineering Considerations and Laboratory Tests
SR-3580	Bellcore Special Report, Network Equipment-Building System (NEBS) Criteria Levels

C. Test Site

All testing was performed in a limited access test laboratory. This facility is located at MET Laboratories, Inc., 914 W. Patapsco Avenue, Baltimore, MD 21230. All testing was conducted in the Environmental Simulation Lab at MET Laboratories, Inc. All equipment used in making physical determinations is accurate and bears recent traceability to the National Standards and Technology.

III. Vibration Test Methods

Method 514.5, Vibration

Test Requirement(s): This procedure utilizes standard laboratory vibration exciters driving the test item directly or through a local fixture.

Test Procedure:

A. The cabinet was loaded with 90 lbs on 6 shelves for a total of 540 lbs.

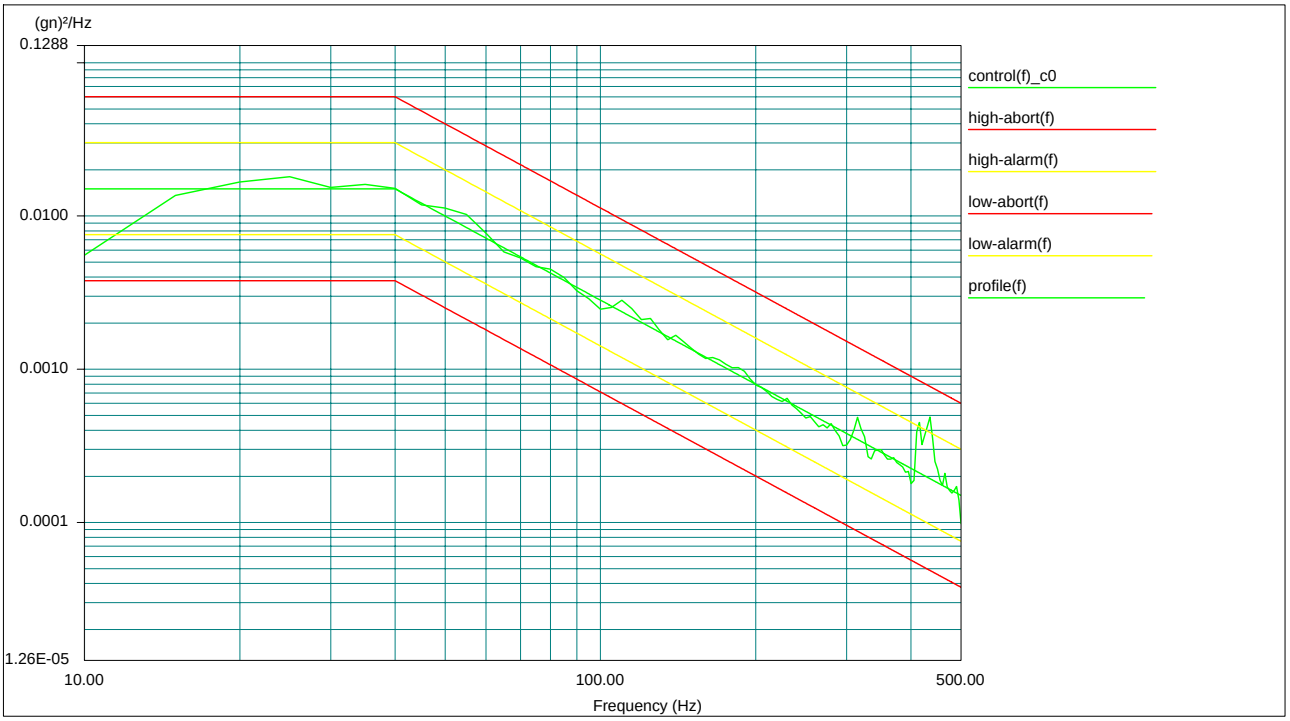
B. The test item is supported by a test frame independent of the vibration exciters.

C. Select the specific exciters based on size and mass of the test items and fixtures, frequency range, and low frequency stoke length required.

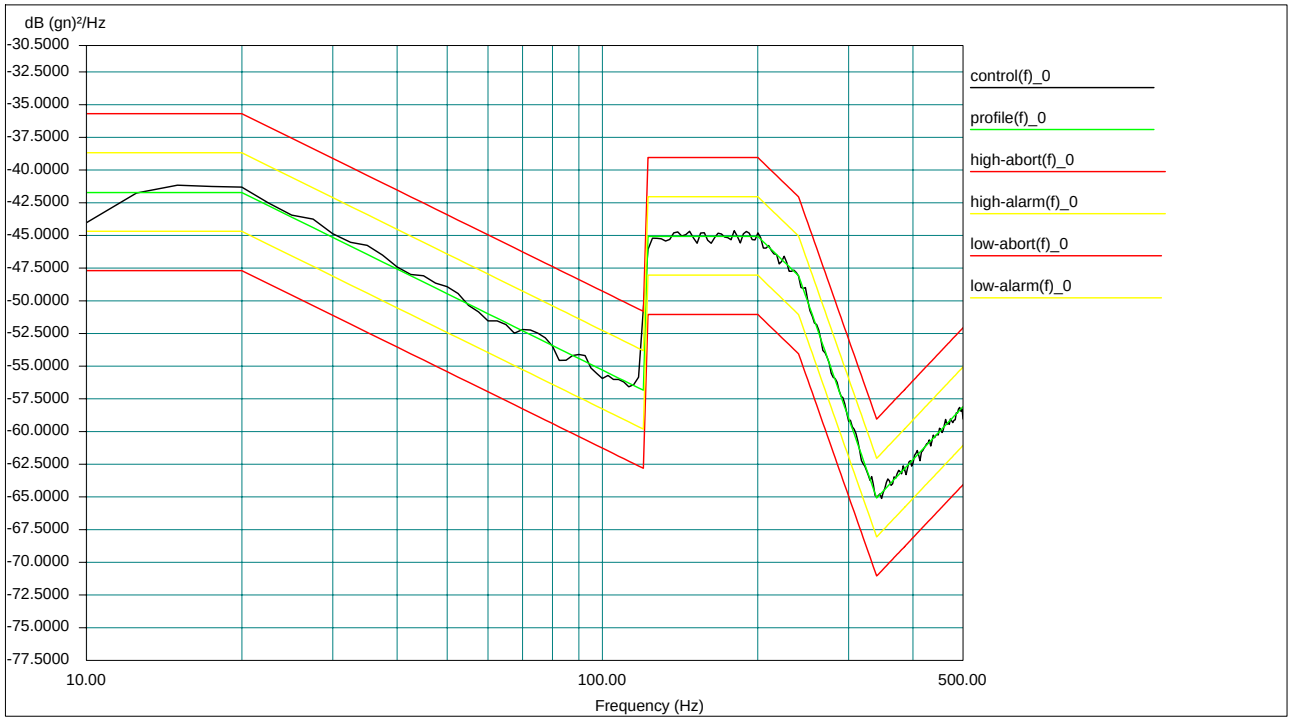
Test Results: During the vibration a few screws backed out and had to be refastened with Lock-Tite. After this correction, no damage or deterioration of functional performance was noted.

Test Engineer(s): Hadid Jones

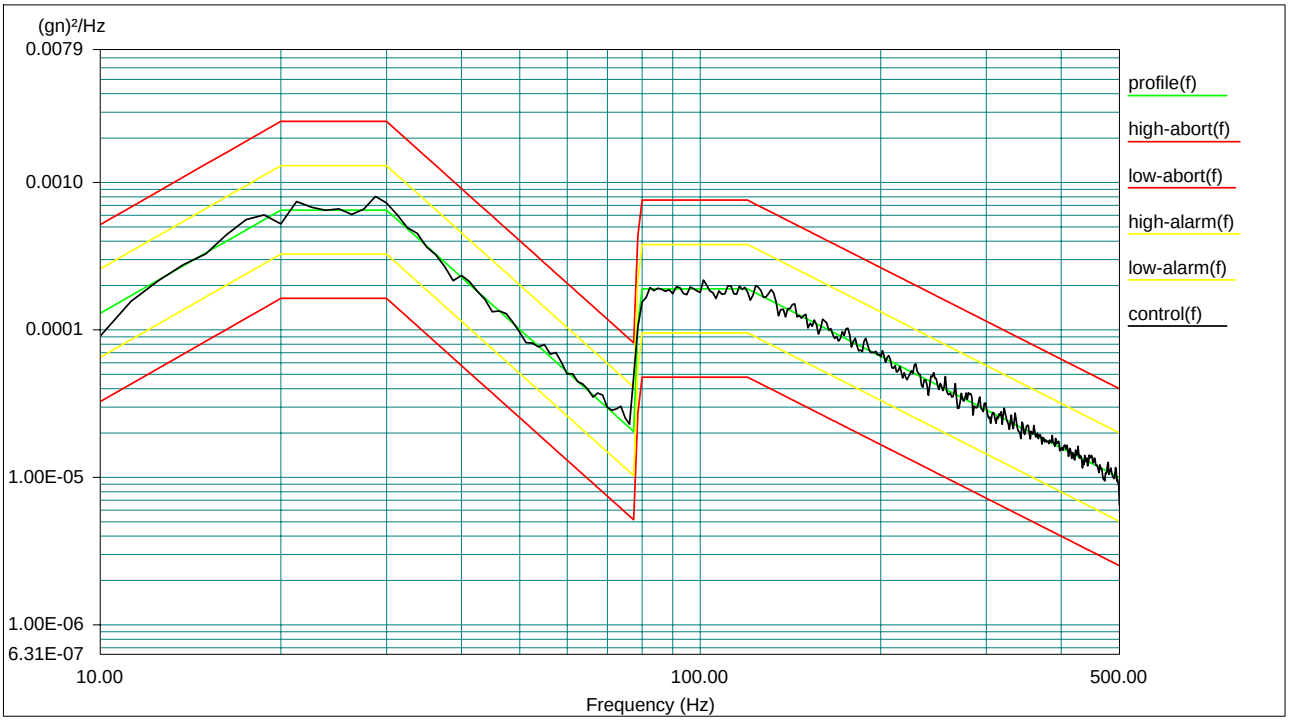
Test Date(s): March 21 – 28, 2006



Plot 1. Vibration, Vertical Axis – Control



Plot 2. Vibration, Longitudinal Axis – Control



Plot 3. Vibration, Transverse Axis – Control

Photograph 1. Vibration, Vertical Axis Test Setup

Photograph 2. Vibration, Longitudinal Axis Test Setup

Photograph 3. Vibration, Transverse Axis Test Setup

IV. Shock Test Methods

Method 516.4, Shock

Test Requirement(s):

The equipment **shall not** sustain any damage or deteriorate in functional performance during or after it has been exposed to the environment described in MIL-STD-810E.

Test Procedure:

A. The cabinet was loaded with 90lbs on 6 shelves for a total of 540lbs.

B. A dummy load and an input (control) accelerometer were mounted to the table of the shock machine.

C. Calibration shocks were performed until two consecutive shock pulses produced waveforms that met or exceeded the shock profile.

D. The EUT was installed on the vibration test fixture.

E. The proper operation of the EUT was verified. Unless otherwise noted the EUT was in an operational mode during testing.

F. The EUT was subjected to three shock pulses, in each direction of each axis, at the test levels on Table 1.

Input Profile	Duration
100 m/s^2	11ms

Table 1. Shock Pulse Levels

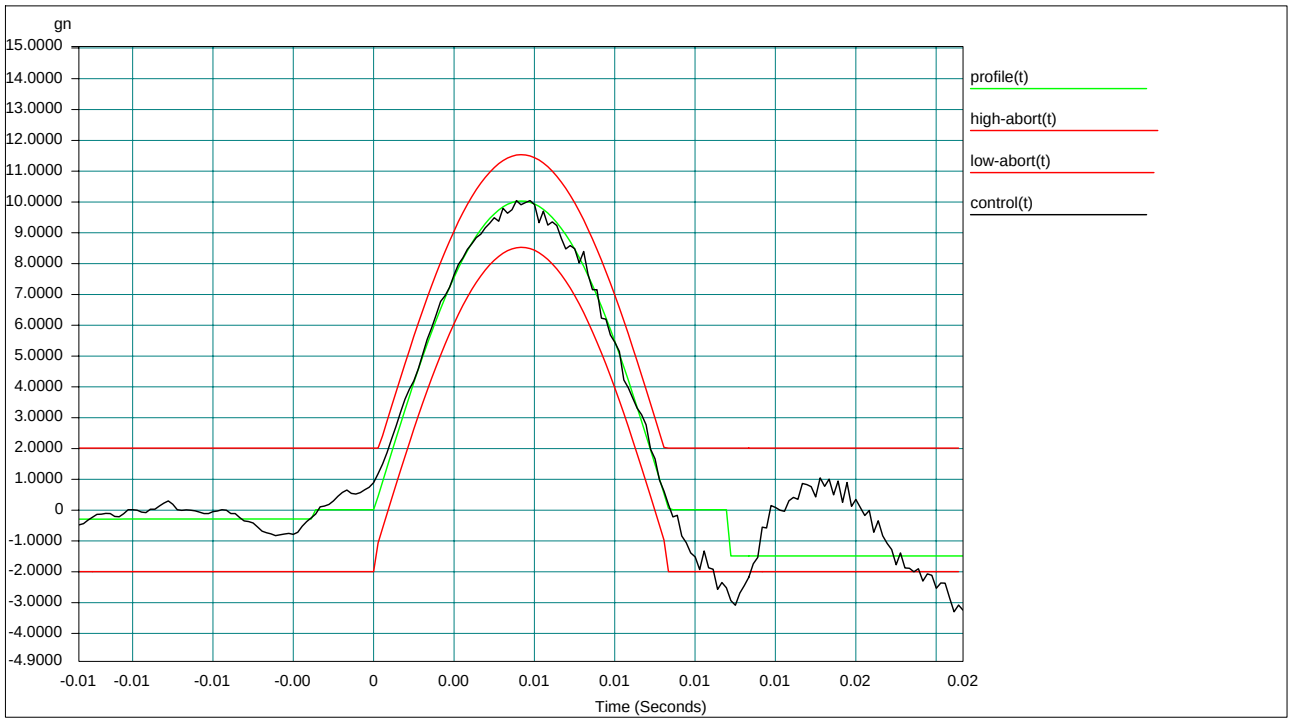
Test Duration ≈ 3 pulses/direction/axis

G. Before, during, and after the shock test, the performance of the EUT was evaluated.

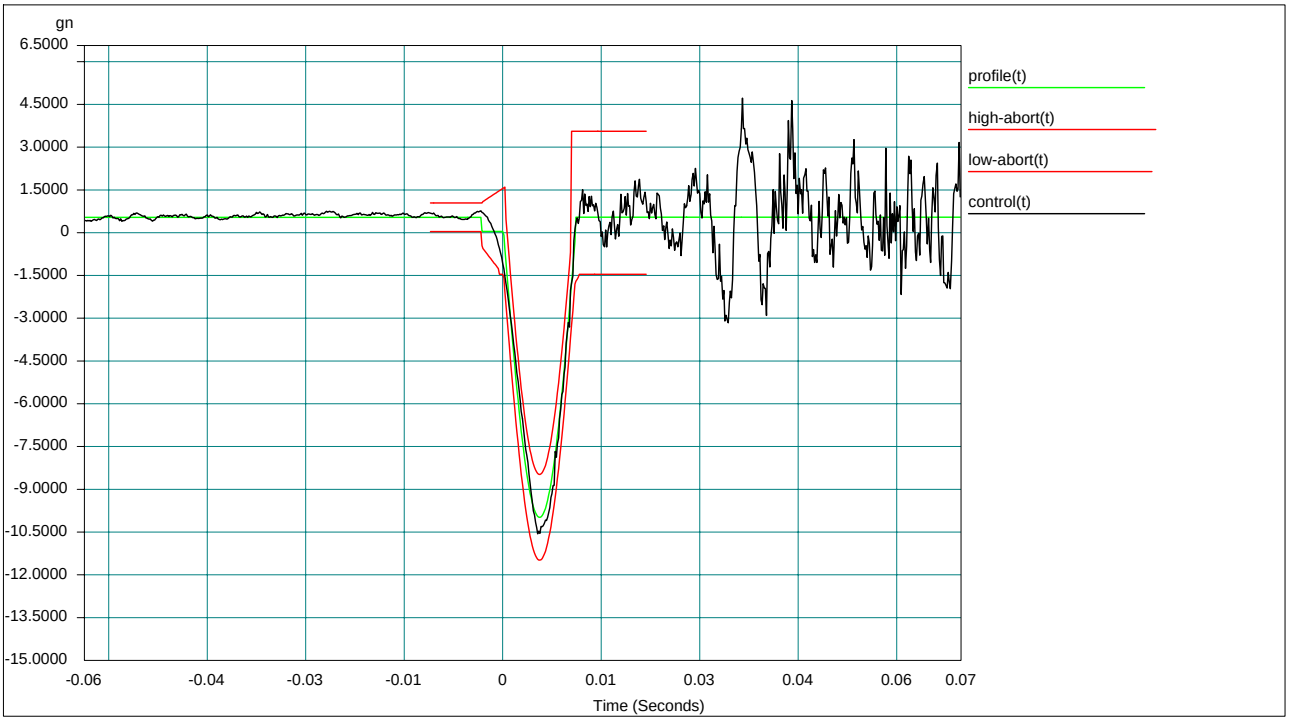
Test Results: The EUT is **compliant** with the requirement(s). No damage or deterioration of functional performance was noted as a result of this test. The functionality of the EUT was evaluated before and after the test with no anomalies noted.

Test Engineer(s): Hadid Jones

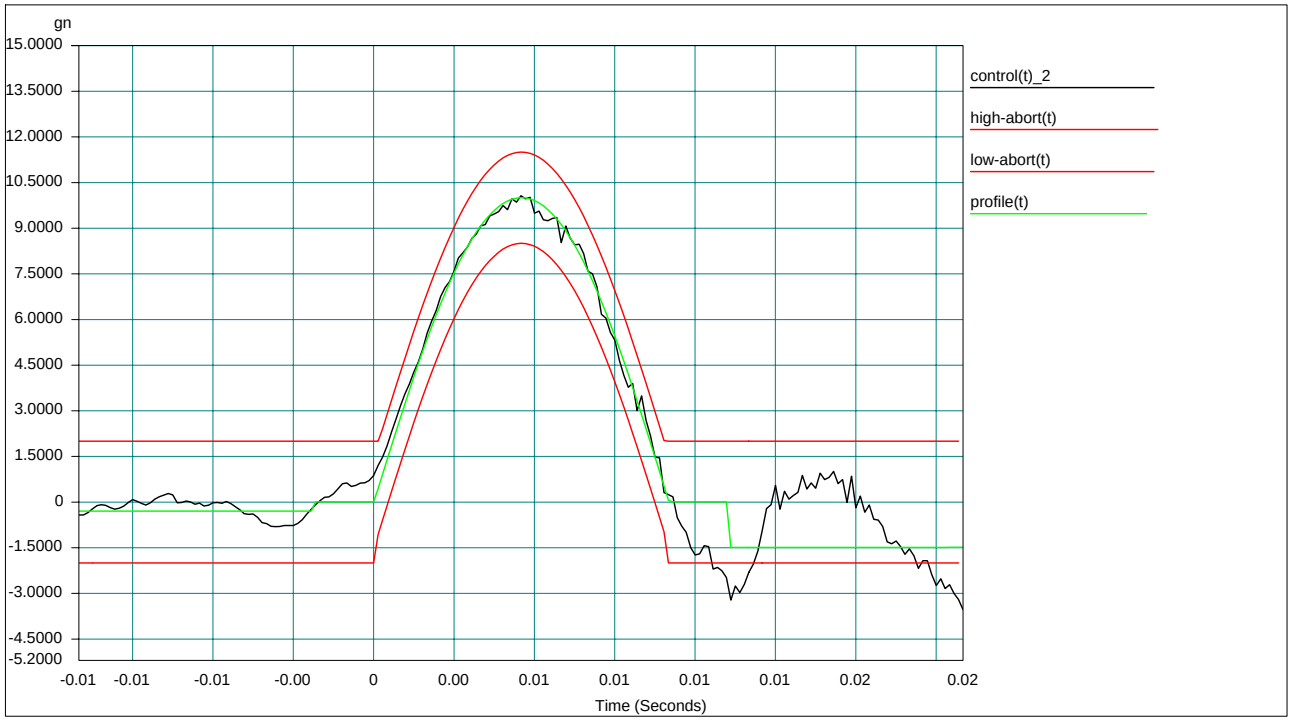
Test Date(s): March 21, 2006



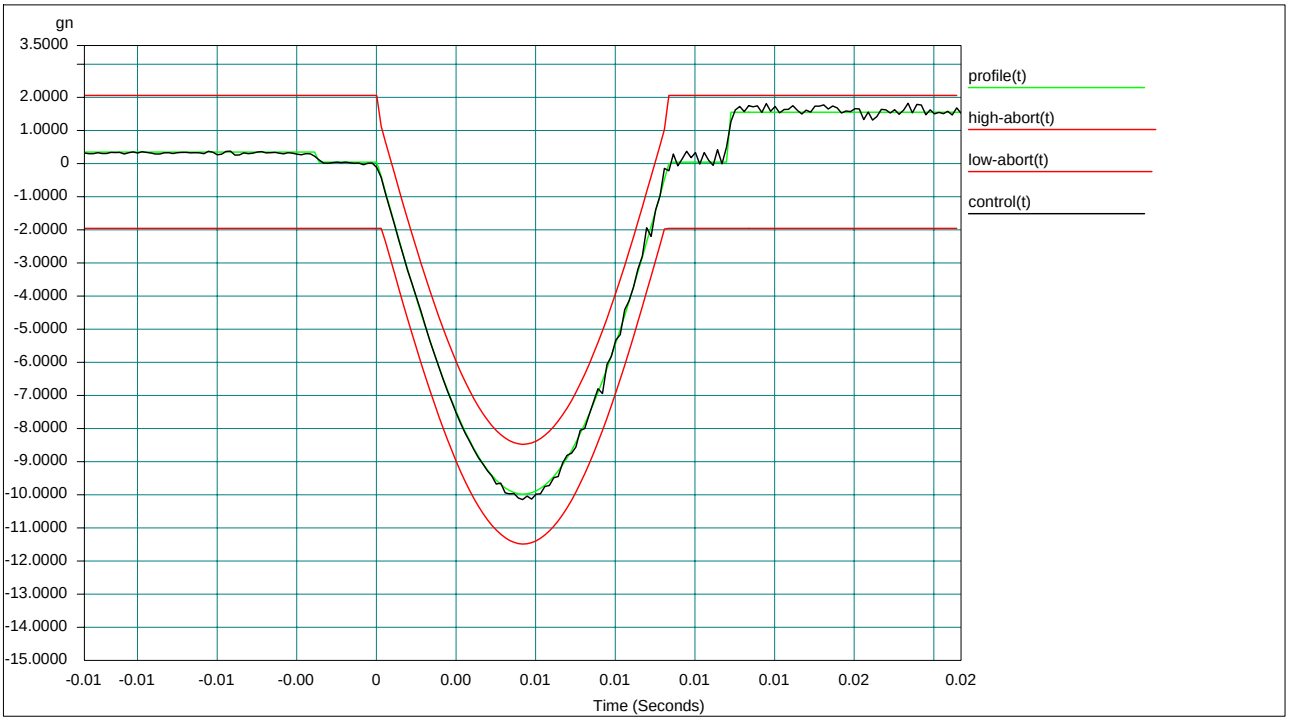
Plot 4. Shock, Vertical Axis – Positive Control



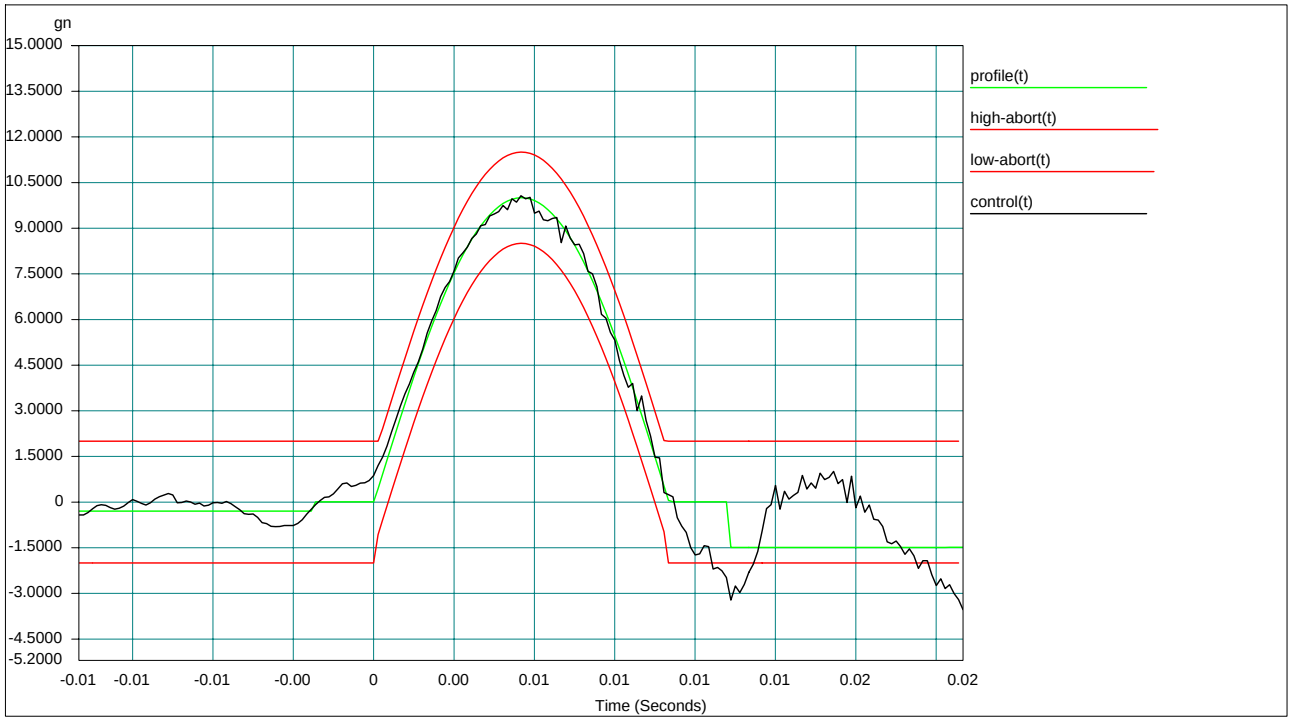
Plot 5. Shock, Vertical Axis – Negative Control



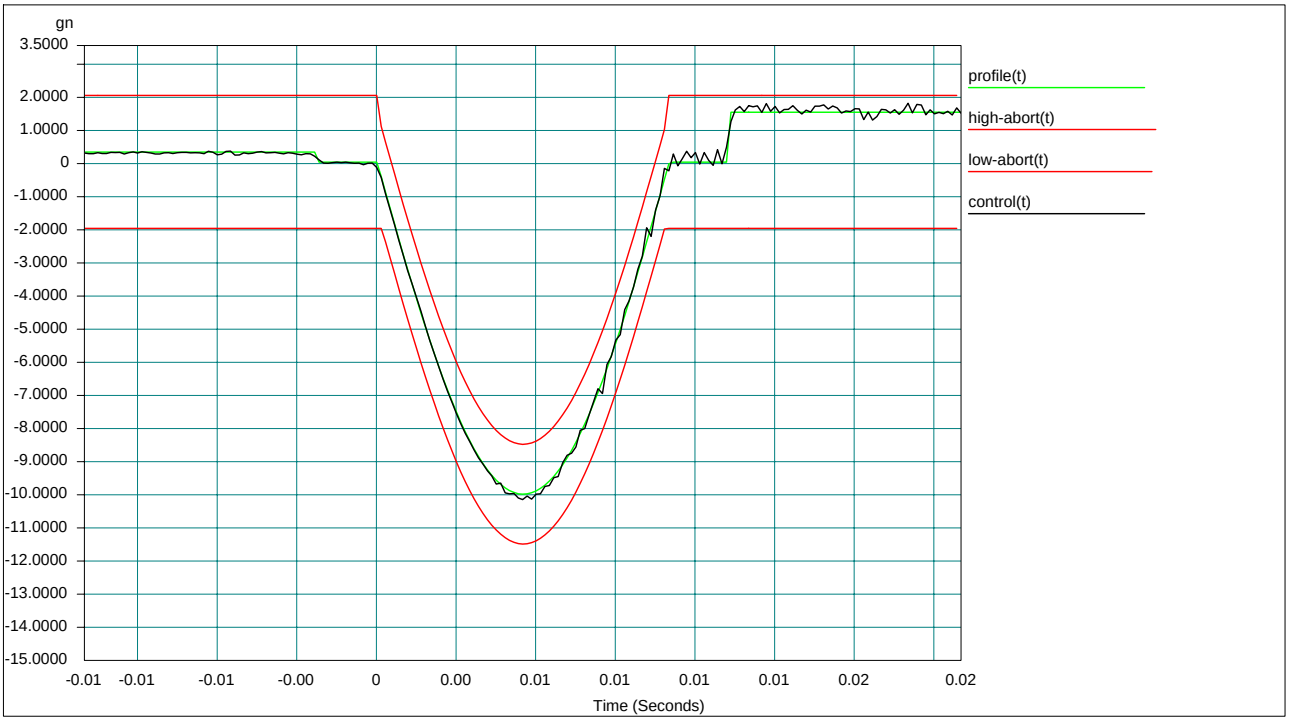
Plot 6. Shock, Longitudinal Axis – Positive Control



Plot 7. Shock, Longitudinal Axis – Negative Control



Plot 8. Shock, Transverse Axis – Positive Control



Plot 9. Shock, Transverse Axis – Negative Control

Photograph 4. Shock, Vertical Axis Test Setup

Photograph 5. Shock, Longitudinal Axis Test Setup

Photograph 6. Shock, Transverse Axis Test Setup

V. Test Equipment

MET Asset #	Equipment	Manufacturer	Model	Last Cal Date	Cal Due Date
2T5663	Shaker System	Unholtz Dickie	None	No Cal Required	
2T5757	Vibration Controller	Dactron	None	4/6/2006	4/6/2007
2T5605	Accelerometer Amp.	Dytran	None	4/25/2005	4/25/2006
2T5535	Accelerometer	PCB	None	8/15/2005	8/15/2006
2T5307	Accelerometer	Dytran	None	8/15/2005	8/15/2006
2T5895	Accelerometer	PCB Piezotronics	None	11/16/2005	11/16/2006

End of Report

