

ACIS Verification Summary Report

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| Specification: | AXAF Observatory to Science Instrument ICD (IF1-20) |
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| Requirement Number/Title: | 3.4.1.2.10 FPSI Dynamic Envelope (VRSD 3.4.1.2.10) |
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Requirement Statement: The ACIS dynamic envelop shall not, in general, extend more than 0.5 in beyond the static envelope.

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| Verification Method: | ANALYSIS |
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Procedure Number:

Configuration:

Cycle Time:

Verification Discussion/Results:

THE DYNAMIC ENVELOPE DOES NOT EXCEED THE 0.5 IN. STATIC ENVELOPE. SEE DOCUMENT 36-01504 REV. B AND ATTACHMENT.

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 ACIS Cognizant Engineer Date

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Support Structure Loads

Launch Configuration

| | | | | 3 Sigma |
|-------------|------------------------|-------|----|-----------------|
| | Natural Frequency (Hz) | PSD | Q | Random Loads, G |
| X Direction | 214 | 0.015 | 9 | +/- 20.21 |
| Y Direction | 84 | 0.015 | 18 | +/- 17.91 |
| Z Direction | 88 | 0.015 | 26 | +/- 22.03 |

Quasi-static Loads (Liftoff)

| | G | Angular Acceleration (Rad/S ²) |
|-------------|---------|--|
| X Direction | +/- 4.4 | +/- 11.7 |
| Y Direction | +/- 2.4 | +/- 14.1 |
| Z Direction | +/- 2.7 | +/- 16.3 |

Combined Random and Quasi-static Loads for Liftoff

Load Set 1

| | G | Angular Acceleration (Rad/S ²) |
|-------------|-----------|--|
| X Direction | +/- 24.61 | +/- 11.7 |
| Y Direction | +/- 2.4 | +/- 14.1 |
| Z Direction | +/- 2.7 | +/- 16.3 |

Load Set 2

| | G | Angular Acceleration (Rad/S ²) |
|-------------|-----------|--|
| X Direction | +/- 4.4 | +/- 11.7 |
| Y Direction | +/- 20.31 | +/- 14.1 |
| Z Direction | +/- 2.7 | +/- 16.3 |

Load Set 3

| | G | Angular Acceleration (Rad/S ²) |
|-------------|-----------|--|
| X Direction | +/- 4.4 | +/- 11.7 |
| Y Direction | +/- 2.4 | +/- 14.1 |
| Z Direction | +/- 24.73 | +/- 16.3 |

The maximum displacement of the Support Structure takes place under the combined quasistatic, random and angular acceleration loads during launch. Preliminary analysis indicated that maximum displacements occur due to loads in the Z direction. Various combinations of Load Set 3 (components applied in different directions) were used with the finite element model of the Support Structure, and the displacements calculated. The maximum displacement which occurred at the level of the +Z panel was 0.03 inches.