

Abstract Submitted
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Calibration Development for an Unsteady Two-Strut Store Balance RYAN SCHMIT, IAN MAATZ, RUDY JOHNSON, Air Force Rsch Lab - WPAFB — This paper addresses measurements of unsteady store forces and moment in and around a weapons bay cavity. The cavity dimensions are: Length 8.5 inches, Depth 1.5 inches, Width 2.5 with a L/D ratio of 5.67. Test conditions are at Mach 0.7 and 1.5 with $Re \# 2.0e^6/ft$. The 7.2 inches long aluminum store is held in the cavity with two struts and the strut lengths are varied to move the store to different cavity depth locations. The normal forces and pitching moments are measured with two miniature 25 pound load cells with a natural frequency of 24k. The store-strut-load cell balance can also produce unwanted structural eigenfrequencies at or near the cavity's Rossiter tones. To move the eigenfrequencies away from the cavity's Rossiter tones calls for detailed design and Finite Element Modeling (FEM) before wind tunnel testing. Included are the issues in developing a calibration method for an unsteady two-strut store balance for use inside a scaled wind tunnel weapons bay cavity model.

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