"Force Limited Vibration Tests at JPL--A Perfect Ten"

A new vibration testing technique, which limits the force applied to the test item by the shaker, has been used successfully in ten JPL flight hardware tests during the past three years. For lightweight aerospace structures, the mechanical impedance of the test item and the flight mounting structure are typically comparable so that the combined motion involves modest interface forces and little amplification. Thus the high amplification resonances and associated failures which often occur in conventional vibration tests, with essentially unlimited force, are test artifacts which can be conveniently eliminated with force limiting. The most recent of the ten JPL applications of force limiting was the Wide Field Planetary Camera II for the Hubble Replacement Mission scheduled for December 1993 and the first was the radiative cooler for the Pressure Modulator Infrared Radiometer (PMIRR) on the Mars Observer spacecraft which will begin orbiting Mars in August 1993.

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