C-5

VIBRATION ISOLATION FOR LINE OF SIGHT PERFORMANCE IMPROVEMENT

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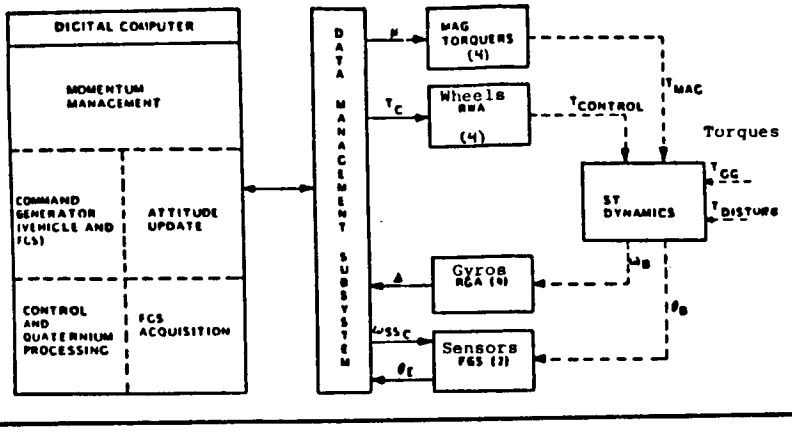
Pointing Control System Block Diagram



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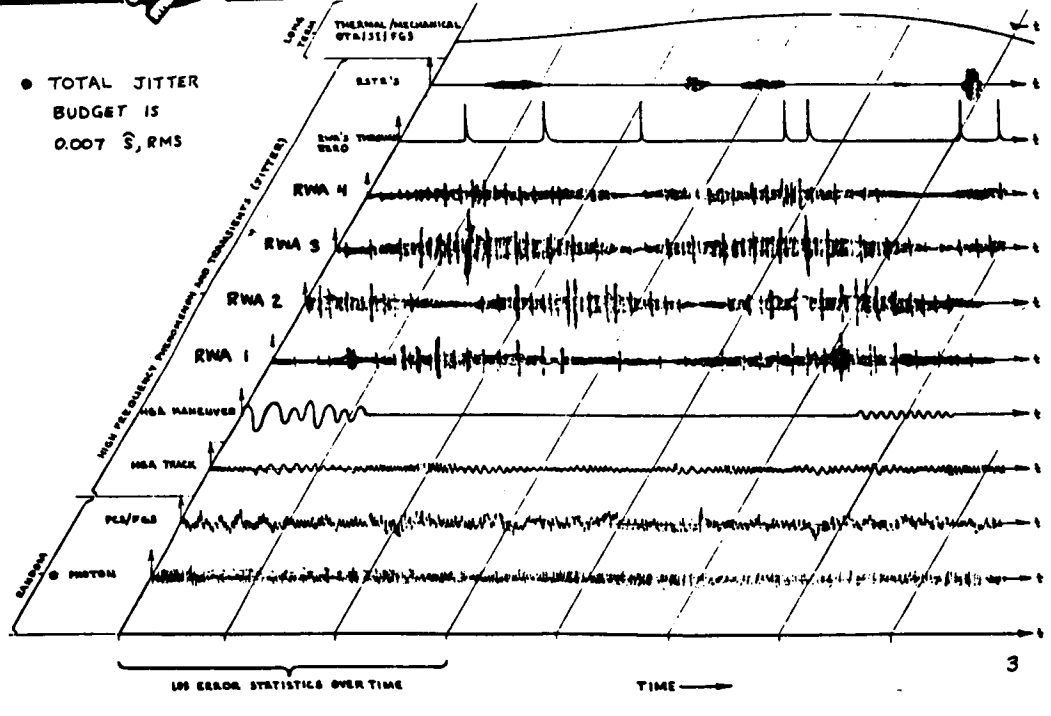
Jitter Error Model

- TOTAL JITTER BUDGET IS 0.007 ŝ, RMS



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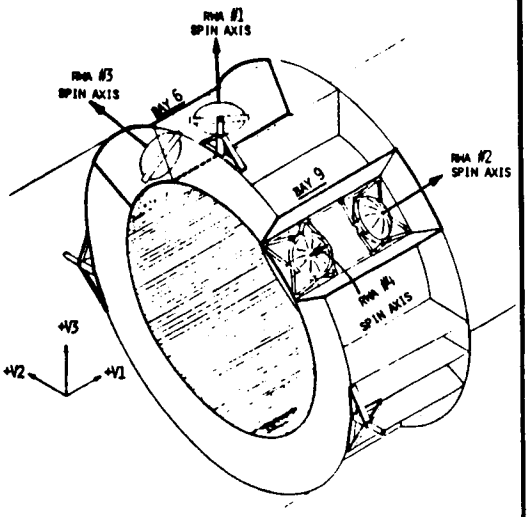
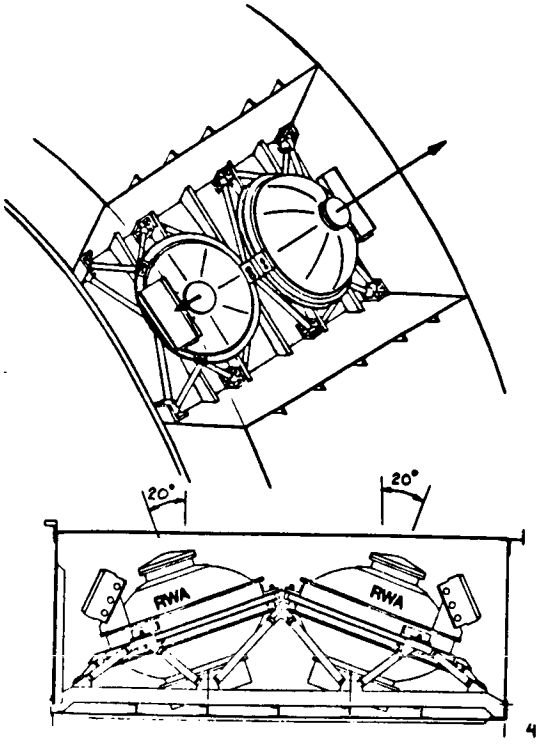
RWA UNIT / EQUIPMENT SECTION BAY DETAILS



OVERVIEW : 33M EQ. SECT.



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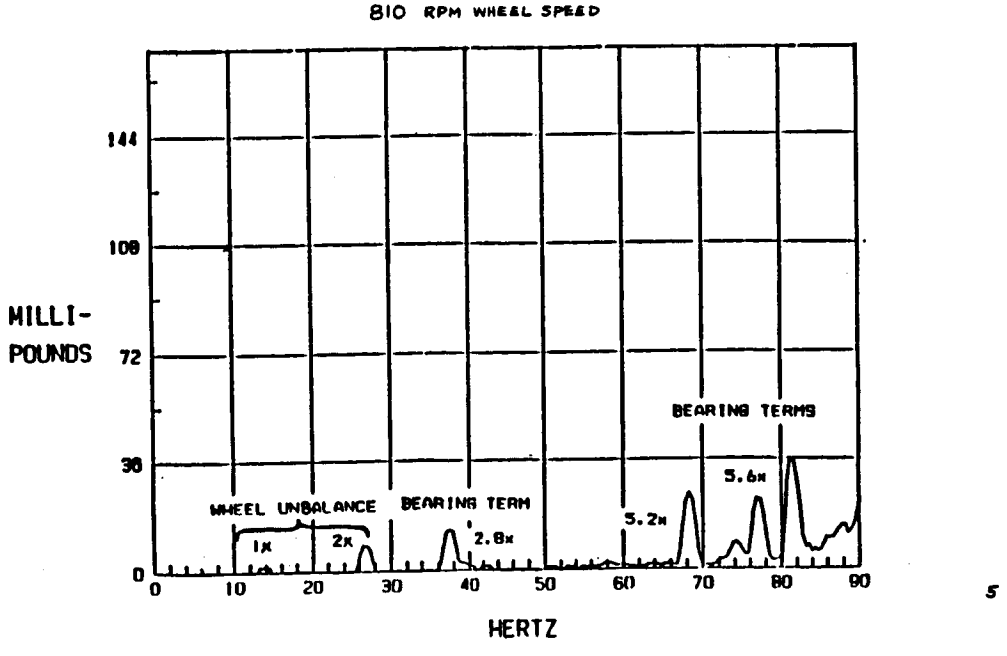
ST RWA INDUCED VIBRATION TEST



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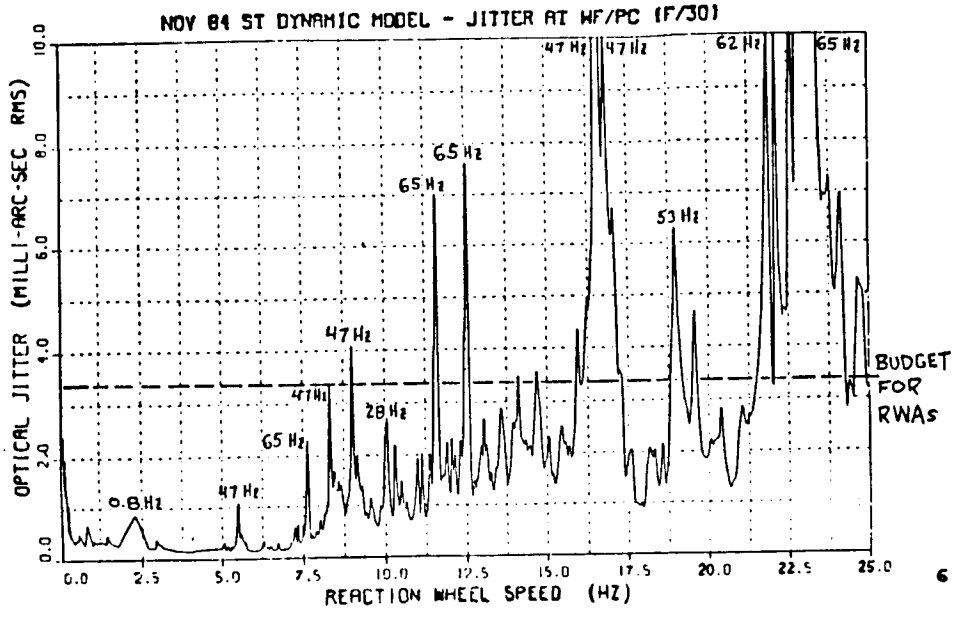
MODE, AXIAL

HARDMOUNTED RWA INDUCED JITTER: 1005



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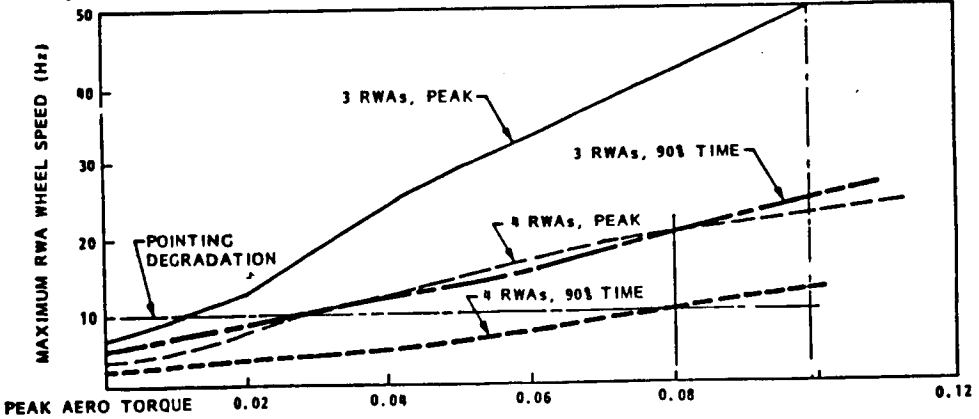
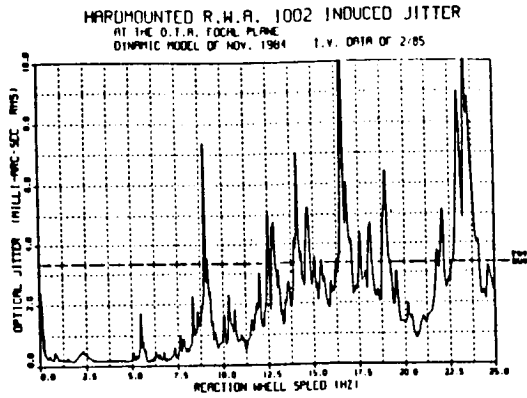
RWA WHEEL SPEED / AERO TORQUE SENSITIVITY RESULTS—V2 POP



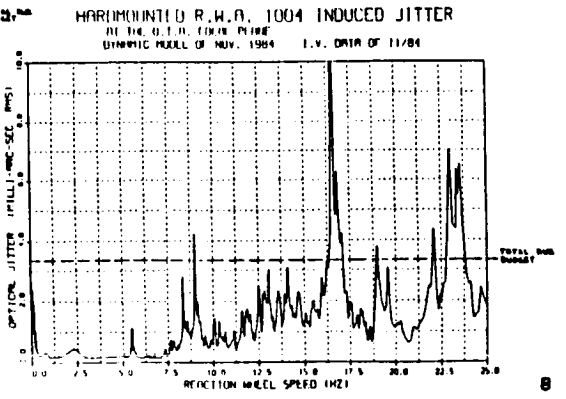
SOLAR ACTIVITY	ALTITUDE (Km)					
LOW	535	480	455	430	410	405
HIGH	750	655	605	570	535	525

NOMINAL HST ALTITUDE IS 580 KM

NOISY WHEEL



QUIET WHEEL



- ANALYSIS SHOWS RWAs WILL EXCEED THEIR JITTER BUDGETS

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RWA ISOLATOR SPEC REQUIREMENTS

PARAMETER	REQUIREMENT
• AXIAL STIFFNESS	900-1100 LB/IN
• LATERAL STIFFNESS	1380-1870 LB/IN
• AXIAL DAMPING	.300-.060 (Q = 3 TO 20)
• LATERAL DAMPING	.170 - .025 (Q = 3 TO 20)
• MEET DYNAMIC PROPERTIES WITH STATIC 1G LOAD ON 3 UNITS	37.0 LB AXIAL 102.0 LB RADIAL
• ENVIRONMENT	TEMP: -20 F TO +120 F PRESSURE: 810 TO 10^{-13} TORR ACCEL.: 9.2 g's FOR 1.5 MIN. RANDOM VIB: 6.18 g (rms) OVERALL
• LIFE	UNIT: 2 YEARS GROUND 5 YEARS ORBITAL DAMPING ELEMENT: 7 YEARS
• WEIGHT	4.0 LBS MAX PER ISOLATOR

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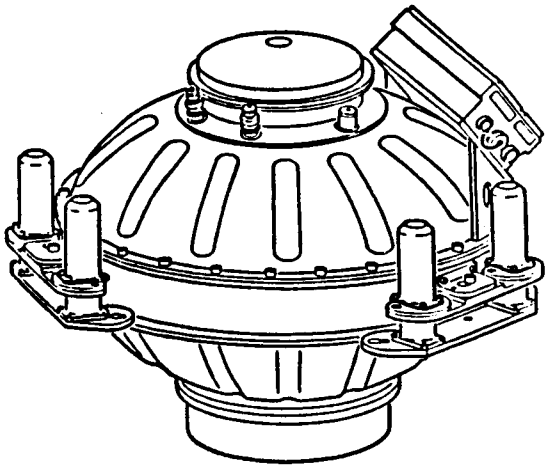
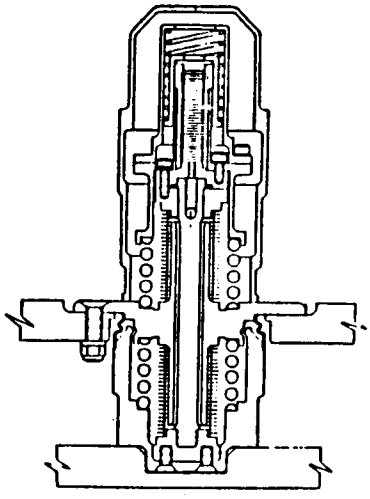
VIBRATION ISOLATION SYSTEM ON AN RWA

REACTION WHEEL ASSEMBLY WITH 3 ISOLATOR UNITS



DAMPER SUBASSEMBLY CUT-AWAY



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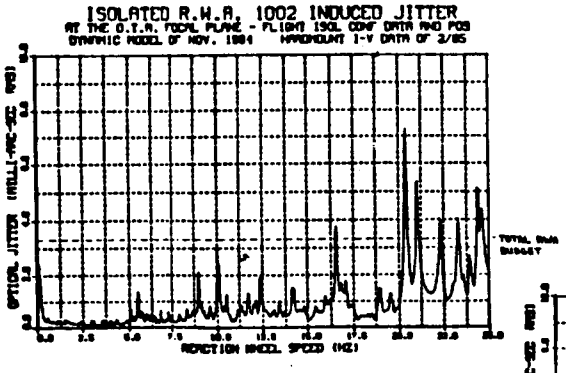
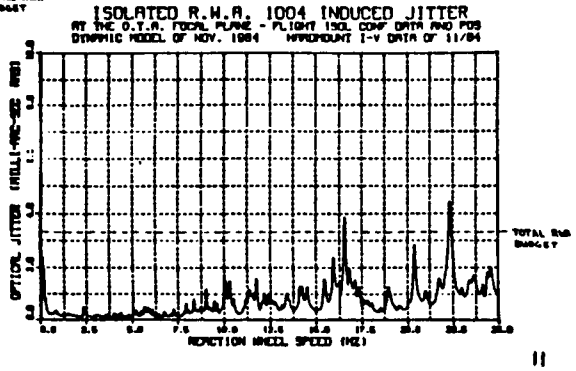


- ANALYSIS SHOWS THAT ISOLATED RWAs WILL MOSTLY REMAIN WITHIN THEIR JITTER BUDGETS



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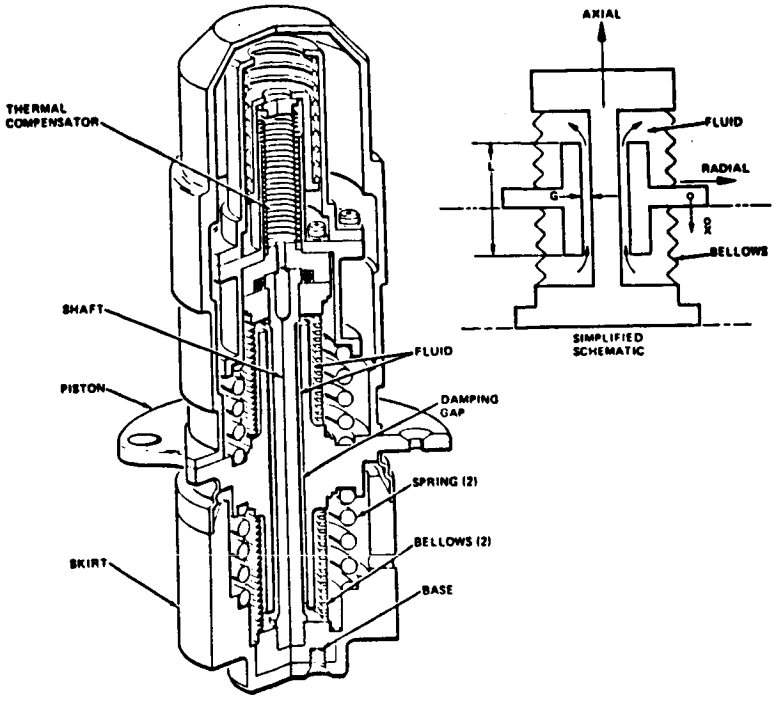
Unit Isolator



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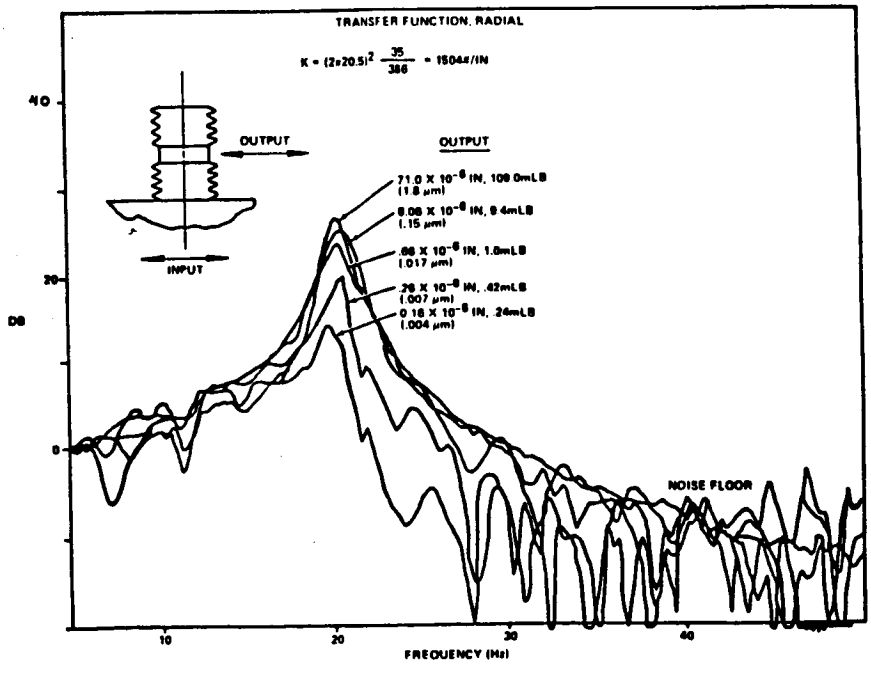
Radial Displacement Transfer Function



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Axial Displacement Power Spectral Density