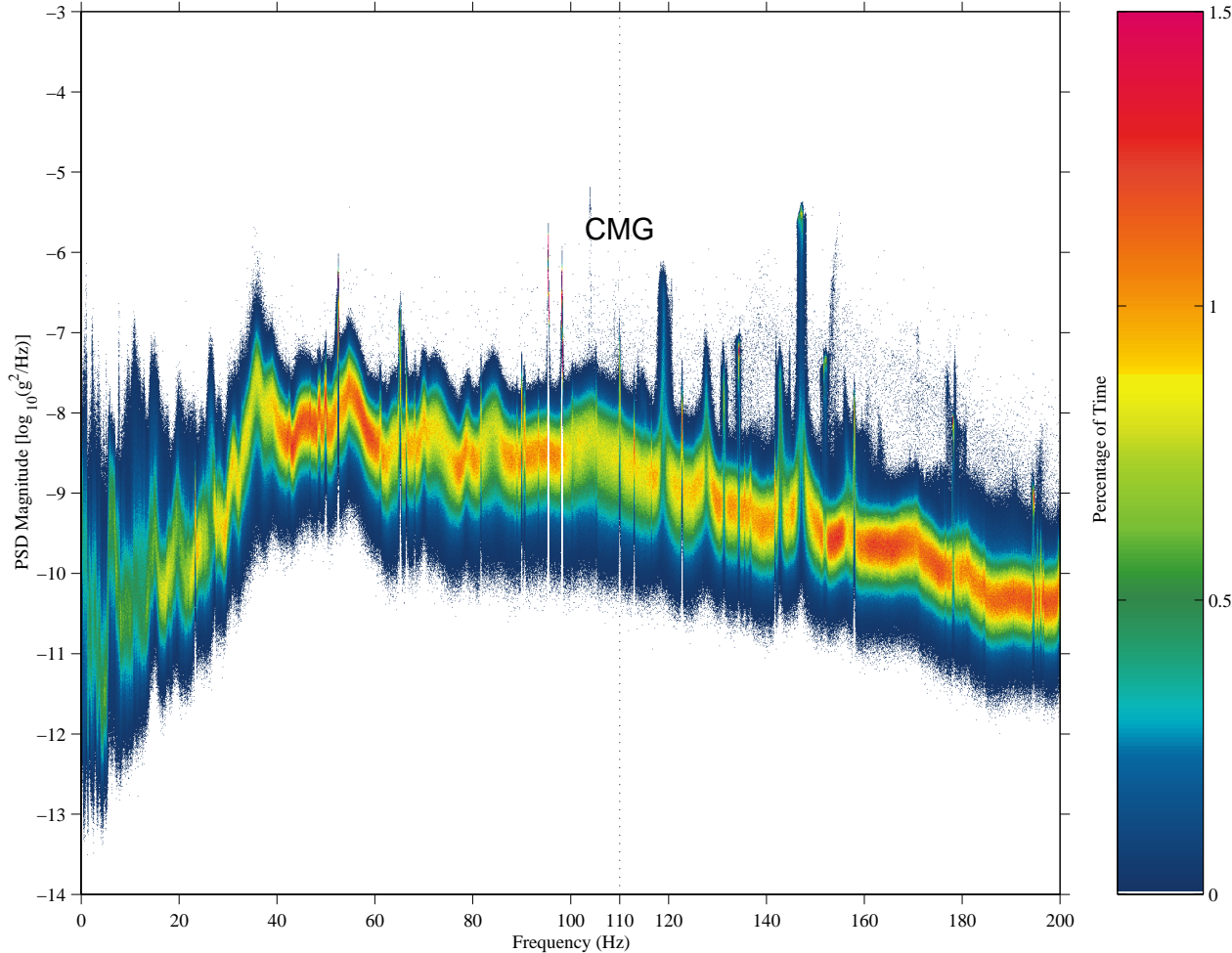


# Control Moment Gyroscope (CMG) QUALIFY

sams2, 121f03 at LAB1O1, ER2, Lower Z Panel:[191.54 -40.54 135.25]  
500.0 sa/sec (200.00 Hz)  
 $\Delta f = 0.122$  Hz, Nfft = 4096  
Temp. Res. = 8.192 sec, No = 0

SAMS 121f03  
GMT 05-Oct-2002 through 07-Oct-2002

Increment: 5, Flight: UF2  
Sum  
hanning, 31141 PSDs  
Total of 70.9 hours

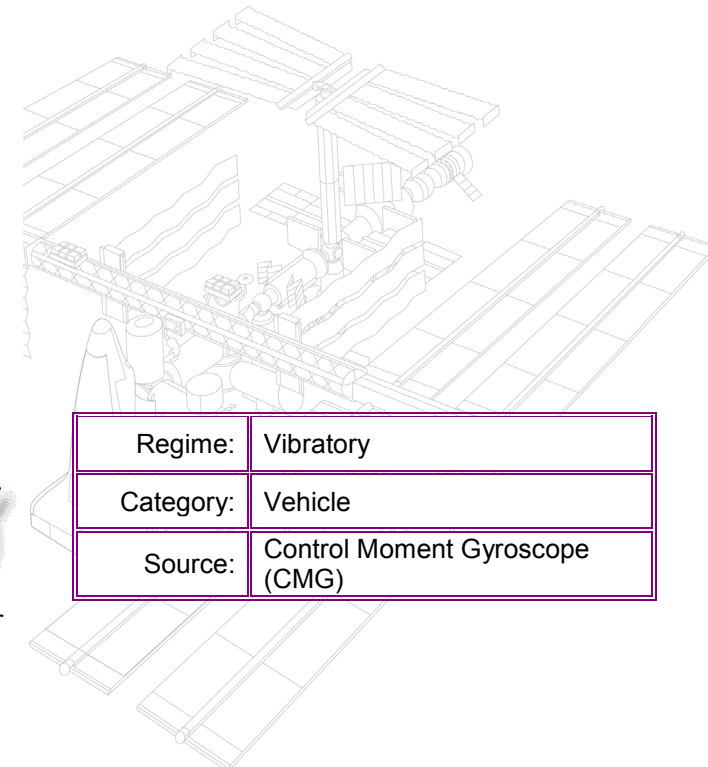


from: t:\pub\pad5, \$Name: pcp3\_06-17-2002 \$, 24-Jun-2002,06:19:13,602

Data Description	
Sensor	121f03 500.0 sa/sec (200.00 Hz)
Location	LAB1O1, ER2, Lower Z Panel
Inc/Flight	Increment: 5, Flight: UF2
Plot Type	PCSA

### Notes:

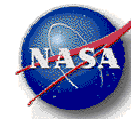
There are 4 control moment gyroscopes (CMGs) located on the Z1 truss structure (currently, only 3 are operational). These rotate at 6,600 revolutions per minute (RPM) within 1 RPM (1/60 Hz) to provide non-propulsive attitude control for the space station. The principal component spectral analysis (PCSA) plot at the left summarizes the acceleration spectrum for a 3-day span. As seen by the narrow spectral peak at 110 Hz, these gyros are tightly controlled in frequency.



Regime:	Vibratory
Category:	Vehicle
Source:	Control Moment Gyroscope (CMG)



Microgravity Science Division



Glenn Research Center

## Control Moment Gyroscope (CMG) QUANTIFY

sams2, 121f03 at LAB101, ER2, Lower Z Panel:[191.54 -40.54 135.25]

500.0 sa/sec (200.00 Hz)

$\Delta f = 0.122$  Hz, Nfit = 4096

Temp. Res. = 8.192 sec, No = 0

CMGs, 109.983 < f < 110.017 Hz

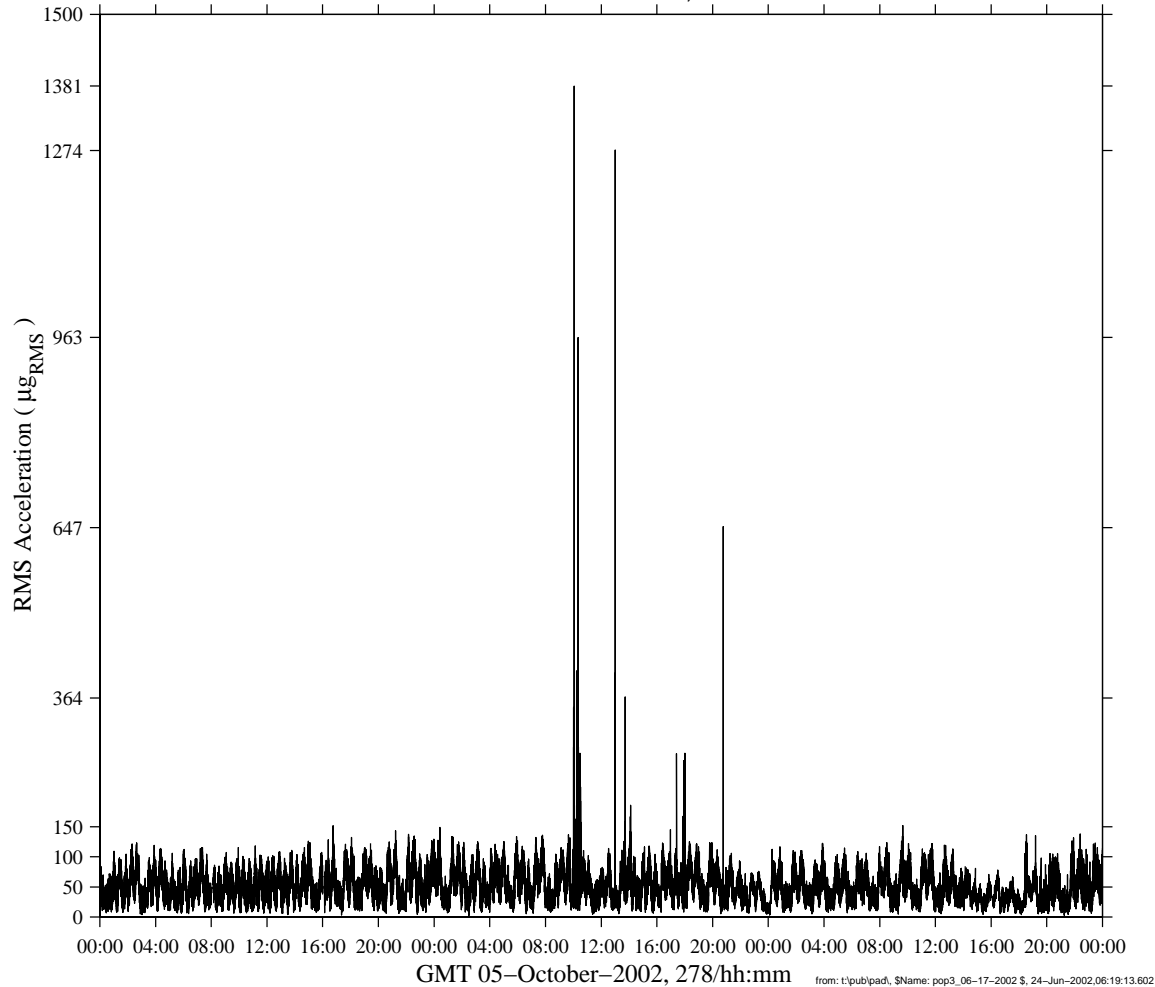
Start GMT 05-October-2002, 278/00:00:00

Increment: 5, Flight: UF2

Sum

Hanning, k = 31141

Span = 72.00 hours



from: t:\pub\pad, \$Name: pop3\_06-17-2002 5, 24-Jun-2002,06:19:13.602

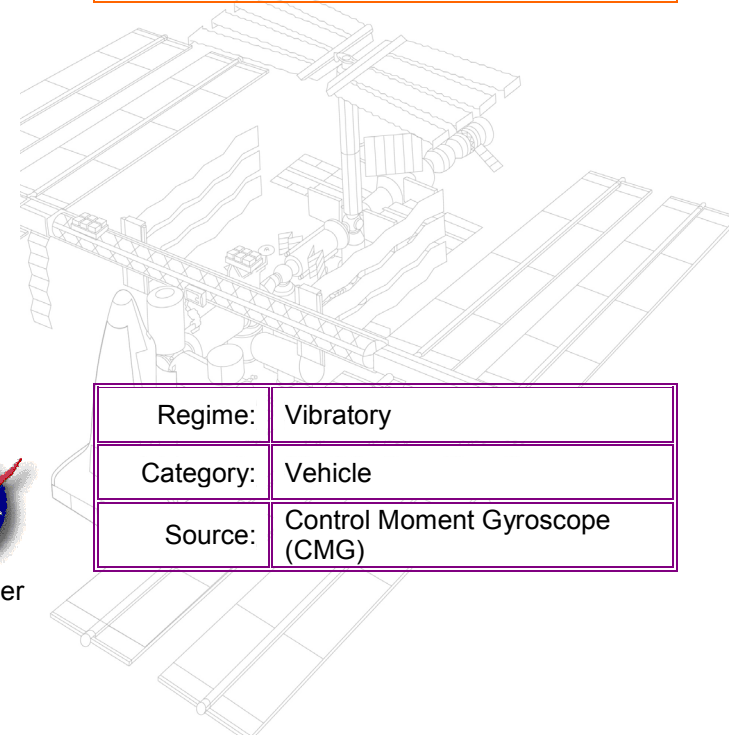
Data Description	
Sensor	121f03 500.0 sa/sec (200.00 Hz)
Location	LAB101, ER2, Lower Z Panel
Inc/Flight	Increment: 5, Flight: UF2
Plot Type	interval RMS

**Notes:**

The plot shows interval RMS values during a 3-day period for a narrow frequency band (109.983 to 110.071 Hz) around the CMG operating frequency (110 Hz). Statistics gathered for this time frame show:

95<sup>th</sup> percentile: 94.9  $\mu\text{g}_{\text{RMS}}$   
 median: 47.7  $\mu\text{g}_{\text{RMS}}$   
 mean: 50.9  $\mu\text{g}_{\text{RMS}}$

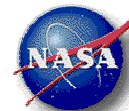
This plot also shows that this small frequency band will also register much higher RMS levels not necessarily attributable to nominal operation of the CMGs.



Regime:	Vibratory
Category:	Vehicle
Source:	Control Moment Gyroscope (CMG)



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