

| Description | | | |
|---|--|--|--|
| Sensor SAMS 121f05 500.0 sa/sec, 200.0 Hz | | | |
| Location JPM1F5, ER4, Drawer 2 | | | |
| Plot Type Spectrogram | | | |
| Notes: This SAMS spectrogram clearly shows the JEM Airlock Vacuum Pump activity between about GMT 11:22 and 14:20. The signature for this activity seems to primarily be the spectral peaks around 24 Hz, with 2nd through 4th harmonics. These are seen as the horizontal red streaks at those frequencies starting at about GMT | | | |

| Regime: | Vibratory |
|-----------|-------------------------|
| Category: | Vehicle |
| Source: | JEM Airlock Vacuum Pump |











| Description | | | |
|---|----------------------------|--|--|
| SAMS 121f03 500.0 sa/sec, 200.0 Hz | | | |
| Location | LAB1O1, ER2, Lower Z Panel | | |
| Plot Type | Spectrogram | | |
| Notes: This SAMS spectrogram again shows the JEM Airlock Vacuum Pump activity between about GMT 11:22 and 14:20. This SAMS sensor, however, was remotely located in the US Lab. The signature for this activity from measurements made in the US Lab appears to be the spectral peak of the fundemental frequency at around 24 Hz, seen starting at about GMT 11:22. | | | |

| Regime: | Vibratory |
|-----------|-------------------------|
| Category: | Vehicle |
| Source: | JEM Airlock Vacuum Pump |







| Description | | | | |
|--|---------------------------------------|--|--|--|
| Sensor | SAMS 121f05 500.0 sa/sec, 200.0 Hz | | | |
| Location | JPM1F5, ER4, Drawer 2 | | | |
| Plot Type | RMS vs. Time | | | |
| Notes: In order to quantify this pump activity, we examine RMS values calculated from SAMS measurements in the JEM for the frequency range from 0.1 to 27.5 Hz. This plot shows the step up in RMS values during pump activity from about 11:21 to | | | | |

about 14:21.

| Regime: | Vibratory |
|-----------|-------------------------|
| Category: | Vehicle |
| Source: | JEM Airlock Vacuum Pump |





PIMS ISS Acceleration Handbook Date last modified 2014-07-30

Glenn Research Center



| | Description | | | |
|---|--|--|--|--|
| | Sensor SAMS 121f03 500.0 sa/sec, 200.0 Hz | | | |
| | Location LAB1O1, ER2, Lower Z Panel | | | |
| | Plot Type RMS vs. Time | | | |
| • | Notes: In order to do a quantitative comparison of this pump activity, we now examine RMS values calculated from SAMS measurements in the US Lab for the frequency range from 0.1 to 27.5 Hz. This plot shows a noticeable step down in RMS values at the end of pump activity near about 14:21, but the start-up is a bit | | | |

| Regime: | Vibratory |
|-----------|-------------------------|
| Category: | Vehicle |
| Source: | JEM Airlock Vacuum Pump |





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| Description | | | | | |
|--|---|--|--|--|--|
| Sensor SAMS 121f05 500.0 sa/sec, 200.0 Hz | | | | | |
| Location | JPM1F5, ER4, Drawer 2 | | | | |
| Plot Type | RMS vs. Time | | | | |
| Notes: | | | | | |
| • In order to quantify this pump activity at | | | | | |
| higher free | higher frequencies (from 27.5 to 130 Hz), | | | | |
| we examine RMS values calculated from | | | | | |
| SAMS measurements in the JEM again. | | | | | |
| • This plot shows only a very slight elevation | | | | | |
| in RMS values during pump activity from | | | | | |
| about 11:21 to about 14:21. | | | | | |

| Regime: | Vibratory |
|-----------|-------------------------|
| Category: | Vehicle |
| Source: | JEM Airlock Vacuum Pump |







| Description | | | | |
|-------------|---------------------------------------|--|--|--|
| Sensor | SAMS 121f03 500.0 sa/sec, 200.0 Hz | | | |
| Location | LAB1O1, ER2, Lower Z Panel | | | |
| Plot Type | RMS vs. Time | | | |
| Notes: | | | | |

- To round out a quantitative comparison, this plot shows SAMS data from the US Lab that is analogous to the previous page's plot of SAMS data in the JEM.
- For this higher frequency range from 27.5 to 130 Hz, we do not see good correlation between vibrations and the pump activity start or stop times.

| Regime: | Vibratory | | | |
|-----------|-------------------------|--|--|--|
| Category: | Vehicle | | | |
| Source: | JEM Airlock Vacuum Pump | | | |





JEM Airlock Vacuum Pump Ancillary Notes

A more in-depth comparison of RMS levels relative to JEM airlock pump activity times is shown in the table below. Note the most dramatic shift in RMS levels occurs for the fundamental pump frequency (near 24 Hz), which is in the range from 0.1 to 27.5 Hz.

| | | | | MEAN ugRMS | | |
|-------------------|-----|-----|--------|------------|--------|-------|
| FREQ. RANGE | ROW | LAB | SENSOR | BEFORE | DURING | AFTER |
| 0.1 < f < 27.5 Hz | 1 | JEM | 121f05 | 196 | 593 | 174 |
| | 2 | COL | 121f02 | 158 | 132 | 98 |
| | 3 | USL | 121f03 | 120 | 170 | 114 |
| 27.5 < f < 130 Hz | 4 | JEM | 121f05 | 801 | 813 | 802 |
| | 5 | COL | 121f02 | 468 | 337 | 352 |
| | 6 | USL | 121f03 | 1532 | 1546 | 1571 |



