Bio-Habitat Testing Capability

Experimental Physics Branch - APS

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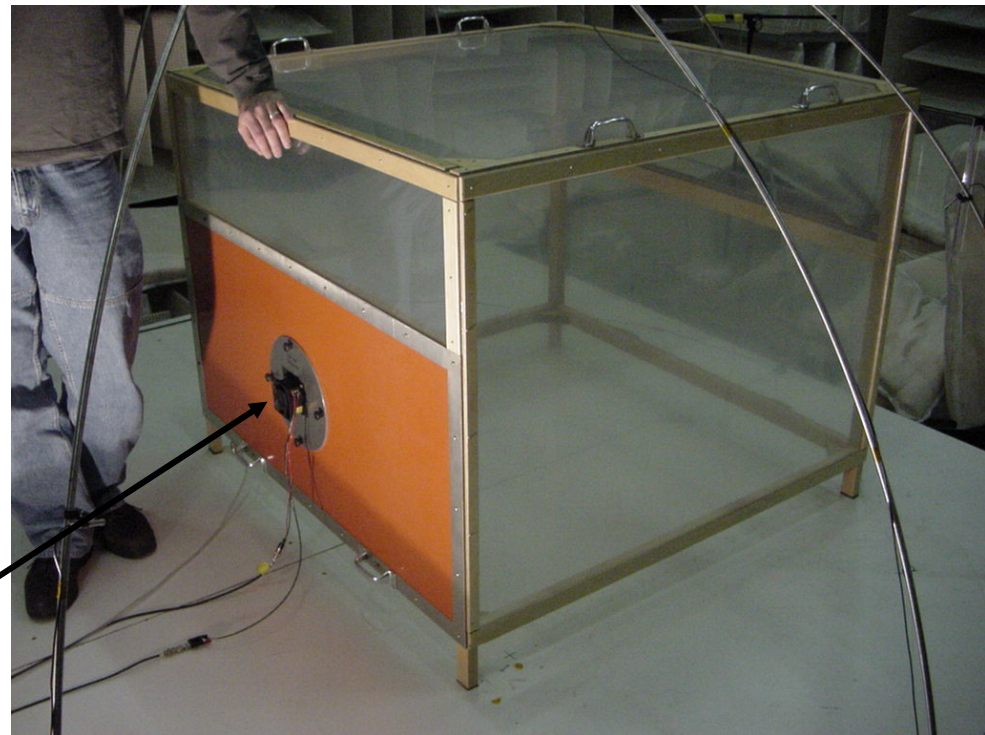
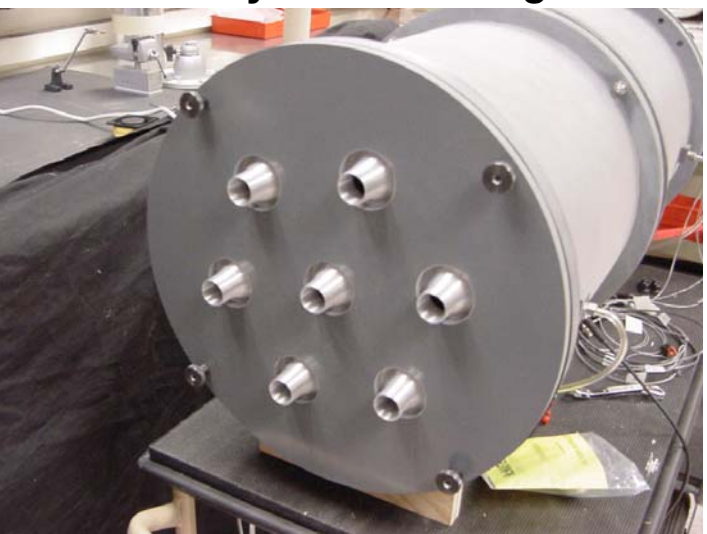
Facilities and Apparatus

Anechoic chamber with habitat on pedestal. Sound power reflection plane and hemispherical microphone grid to left.

ANSI Mylar test rig for fan alone noise testing under load



ANSI aerodynamic test rig



Acoustic Measurements

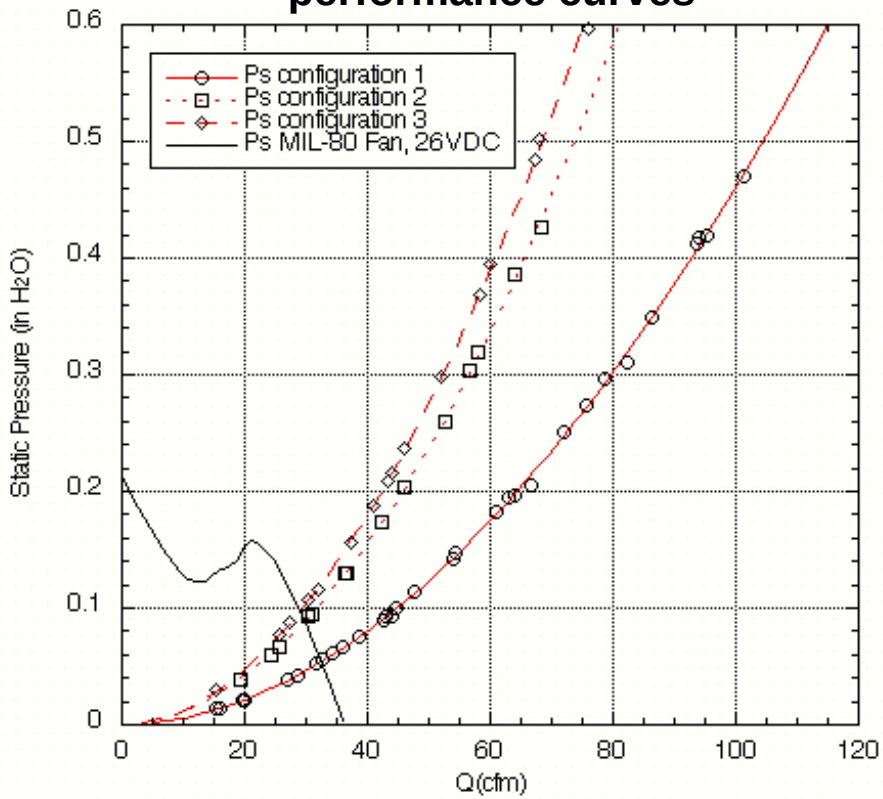
- APS Anechoic Chamber
  - Interior dimensions: 5.49-m by 9.14-m by 3.35-m high wedge-tip-to-wedge-tip
  - Fiberglass wedges: 556-mm deep plus 64-mm air gap
  - Anechoic environment for ISS frequency range and certification distances
  - Hemispherical sound power microphone grid
  - Individual panel units or full racks can be tested
- System noise testing
  - Fan or motor installed noise while operating bio habitat
  - Fan alone noise versus mass flow rate using ANSI acoustic test rig
- Acoustic metrics
  - Octave and third-octave band sound levels
  - A-weighted sound levels
  - Narrow band sound levels
  - Sound power levels
    (overall, octave, third-octave)

System Flow Performance Measurements

- System pressure drop versus mass flow rate using ANSI aerodynamic test rig
- Fan alone pressure head versus mass flow rate
- System noise correlated with system flow performance
- Currently configured for fans delivering up to 6 inches of water and 600 cfm

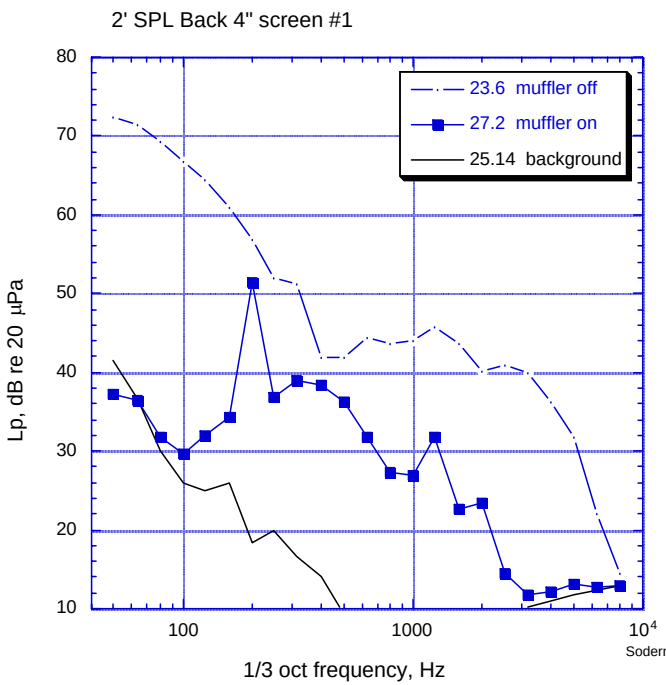
ANSI flow rig mated to bio habitat for system studies

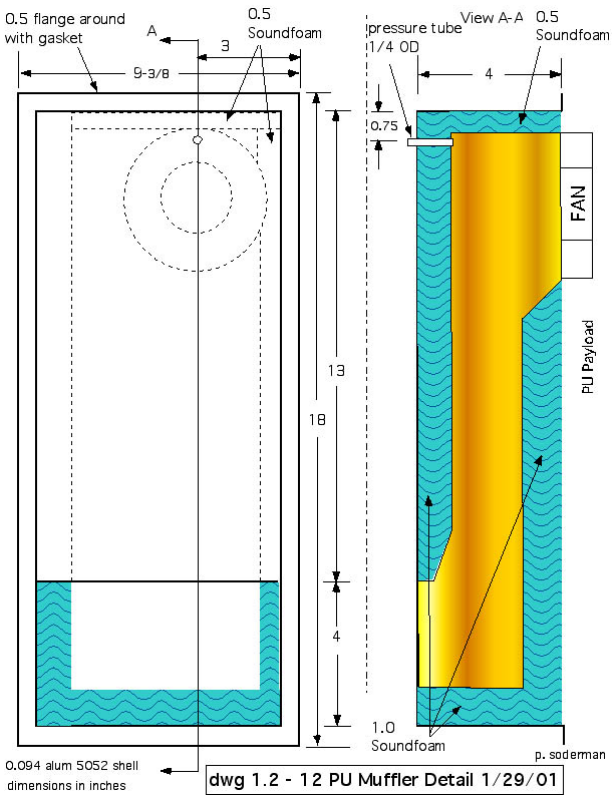
Typical system and fan performance curves

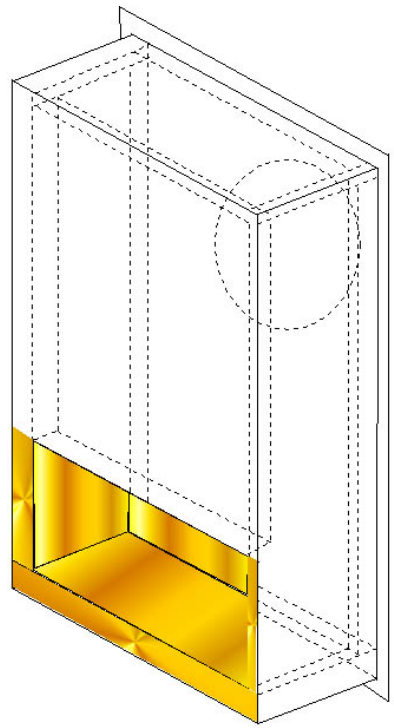


Habitat Muffler Design and Testing

Typical muffler performance







dwg 1.3 - 12 PU Payload Drawer Muffler Oblique View 1/29/01

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Fan exhaust muffler

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