

Harvard OMS CO₂ Instrument

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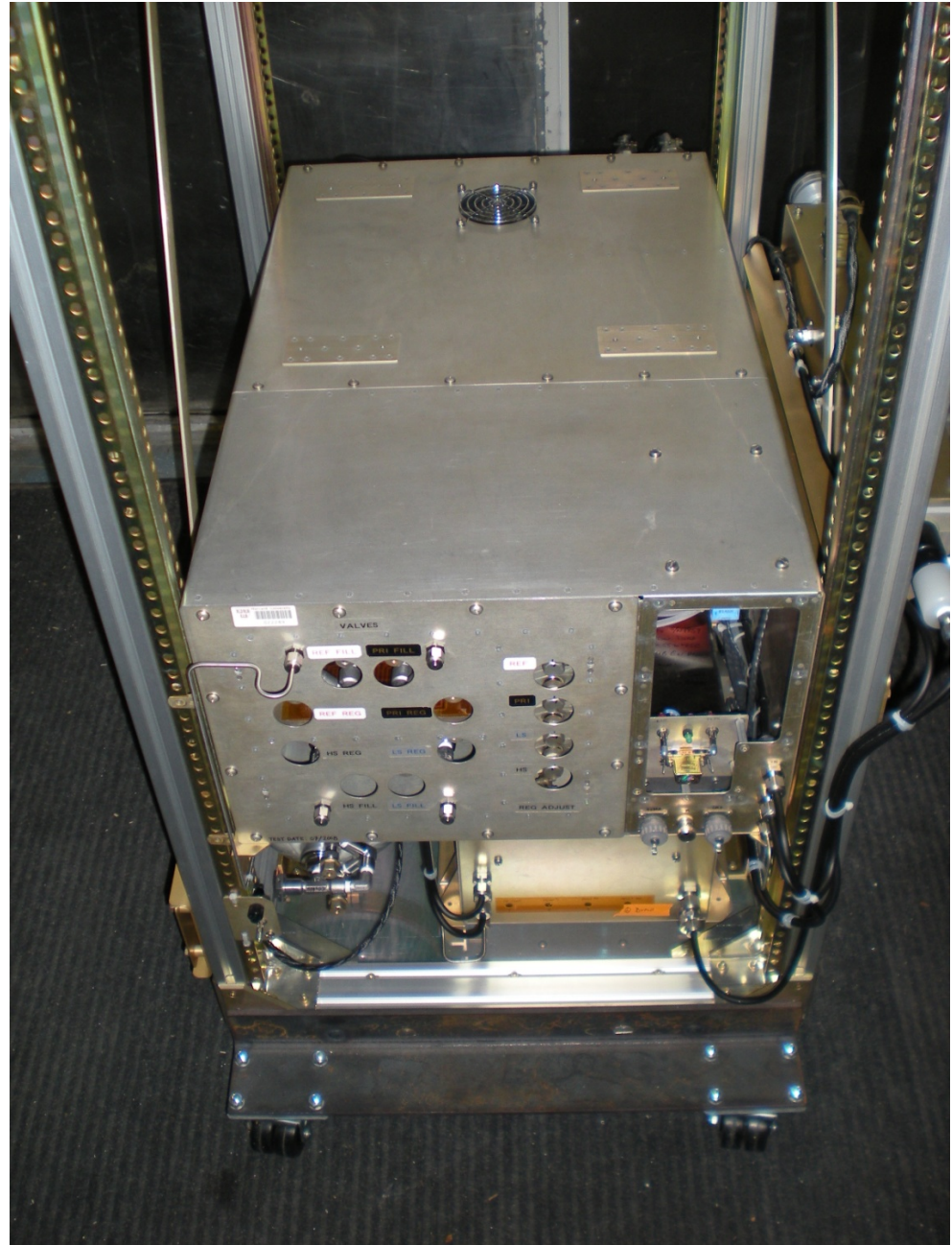
Designed and built in 1996 as a High Altitude Balloon Instrument

Uses Li-Cor 6251 for detector, in a Pressure Vessel. Differential NDIR, uses broadband source and filtered detector (4.26 μm , 150 nm bandpass)

Did 2 intercomparisons with ER-2 CO₂ Instrument, in Fairbanks and Kiruna, Sweden

Also flown on WB-57F, Cessna Citation II, Univ. of Wyo King Air

Does in-flight calibrations using 4 internal 0.7L fiber-wound aluminum cylinders. Zeros every 10 minutes, LS and HS every 30 minutes



OMS Calibration Details

- Prior to campaign, Gas Deck bottles are filled from “Fill Tanks” which are calibrated in our lab against NOAA primaries.
- Gas Deck is calibrated after filling to check for filling errors or other problems.
- Surveillance Std. serves as in-flight check, lasts for duration of campaign.

OMS Data Issues

- HIPPO_1: Installed new cal bottles with Ethylene Propylene o-rings. Caused stability issue / linear decrease in [CO₂]. Corrected using pre- and post-Gas Deck calibrations. (same issue for QCLS)
- HIPPO_2: Potential Gas Deck lab calibration problem, now using Fill Tank value (+0.13ppm)
- HIPPO_3: Fill problem on large REF cylinder, used Surveillance Std. to correct (+0.18ppm)
- Revised data has been submitted to the archive.
- No isotopic corrections have been applied to OMS.

OMS Changes for H4, H5

- No changes planned
- Full round of routine maintenance will be done, including gas bottle replacement, internal chemical scrubber change, and pump rebuild.