The Space Dynamics Laboratory (SDL) and the Missile Defense Agency (MDA) have a state-of-the-art altitude test chamber in SDL’s optical calibration and test facility that enables full characterization of airborne optical sensors. The chamber provides a high-fidelity, realistic test environment for the sensor under test. It is designed to match the environment for the sensor in terms of temperature and pressure characteristics. This chamber can ramp rates quickly when switching between test temperatures/pressures. This saves critical test time when compared to other options. A sophisticated pressure monitoring system is installed to protect the chamber and attached optical components. This chamber is available to U.S. Government users on a no-cost, non-interference basis.

SDL currently has multiple large aperture ZnS Cleartran (infrared), BK7 (visible), and fused silica (visible) windows that can be interfaced to this chamber’s exit ports.

**SPECIFICATIONS**

**INTERIOR WORKING VOLUME** 64 ft³
**INTERIOR DIMENSIONS** 4’ x 4’ x 4’
**ALTITUDE SIMULATION** Sea level – 100,000 ft
**OPERATIONAL TEMPERATURES** -60° C to 125° C
**OPERATIONAL PRESSURES** Ambient to ≤10 Torr
**TEMPERATURE RAMP RATE** ~3°C/min
**OPTICAL PORTS** 3 x 20” round

(SEEN BACK FOR MORE DETAILS)

**SENSOR POSITIONING SYSTEM**
2-axis linear (vertical & front to back)

**REFRIGERATION SYSTEM** Dual compressor with liquid nitrogen boost

*Compressors are remotely located to reduce vibration coupling*
The Electro-optical Altitude Test Chamber interfaced with the MICS (left), HAES15 (right), and visible collimator/monochromator (front)

Sensor positioning system inside the Electro-optical Altitude Test Chamber

**SENSOR POSITIONING SYSTEM SPECIFICATIONS**

- **STROKE Y (FRONT TO BACK)**: 3.63” back, 5.85” forward
- **STROKE Z (UP & DOWN)**: 3.25” down, 3.82” up
- **TRAVERSE RATE**: Average move in 30 sec
- **TEMPERATURE RANGE**: +50˚ C to -55˚ C
- **PRESSURE RANGE**: 0.1 psia to 14.7 psia (5.2 Torr – ambient)
- **SENSOR WEIGHT CAPACITY**: 338 lbs

Supports sensors with built-in rotation & elevation capabilities.