

Improvements in Airborne Aerosol and Trace Gas Measurement Capabilities on the Next Generation NSF UW King Air Research Aircraft

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Facility Description

- **Project requests are now open for our Next Generation King Air** with our first research project slated for Summer 2025
- 2013 Beechcraft King Air 350i
 - 3-4 Scientific Crew
 - 3-4.5 hour duration, up to 2100 nm range (1-way)
 - Operating Altitude Range 200 – 35,000 ft
- **Owned and operated by the University of Wyoming**
- Available to the NSF-GEO community through the Facilities for Atmospheric Research and Education (FARE) program as a LAOF Facility
 - Track 1A and 3 Projects



Requesting a Project

- 1) Reach out to the King Air Facility team with idea and desired timeline

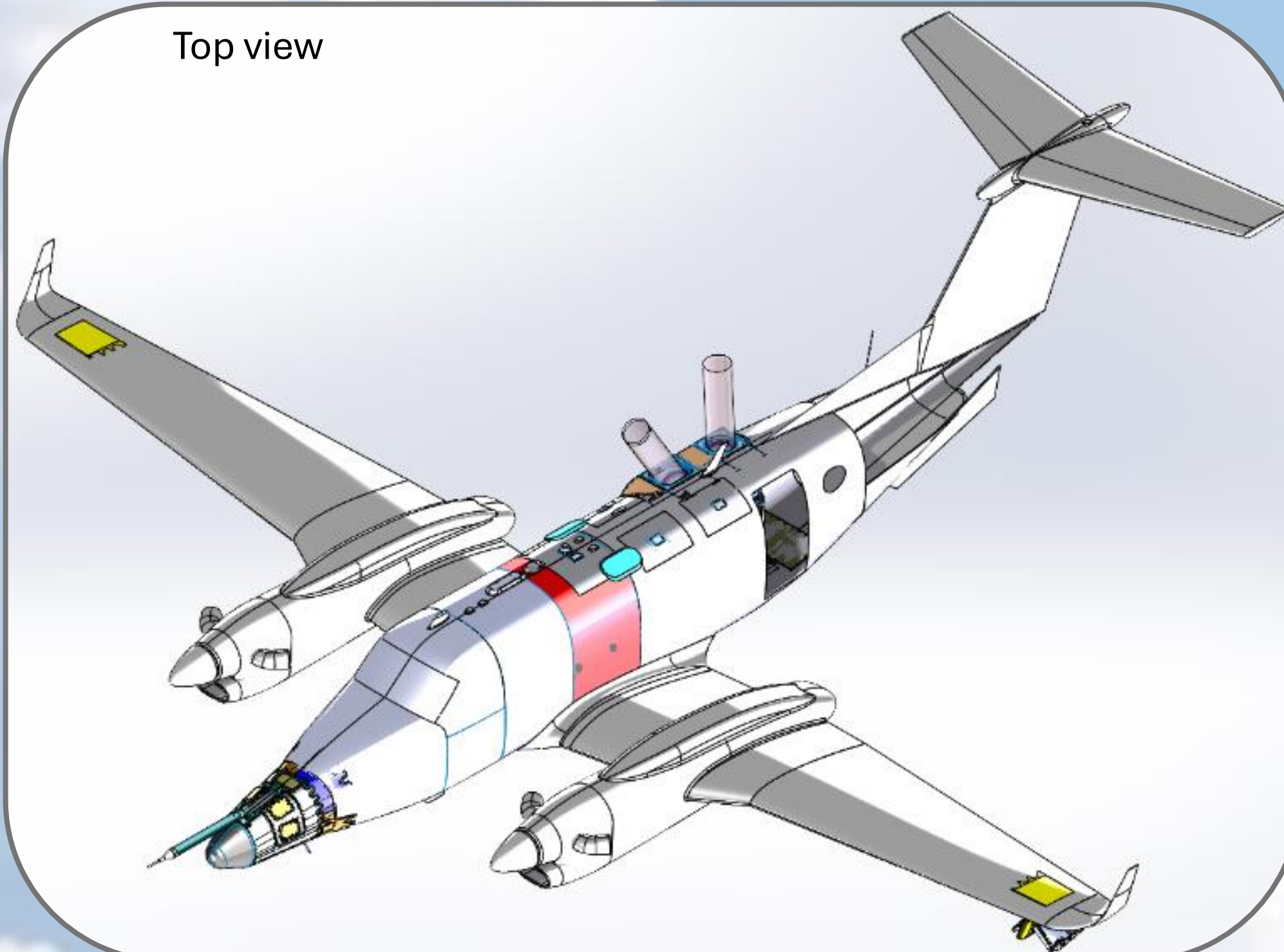
For NSF project requests:

- a) Submit a Statement of Interest (SOI) to NSF
- b) Submit a UWKA Facility Request Form
 - Submit one or two months prior to submitting NSF project proposal for Track 1 (educational) or Track 3 (Field Campaign) proposals, respectively
- c) Submit project proposal to NSF (up to 1 or 2 years prior to desired project duration, for Track 1 or 3, respectively)

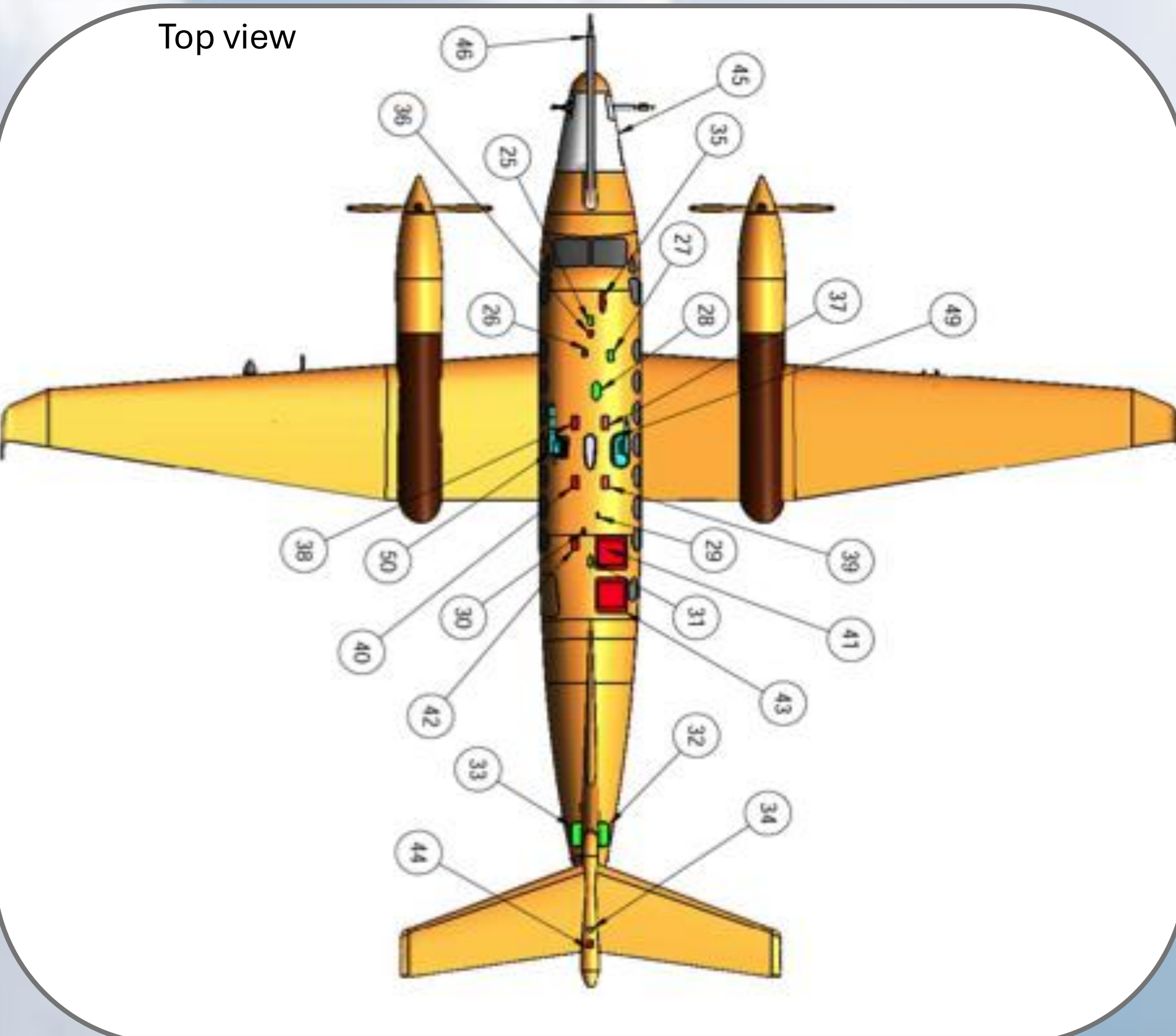
Please visit:

www.uwyo.edu/atsc/uwka/requests.html for more information

Top view



Top view



Scientific Payload Capabilities

Ports and Mounting Locations (for Facility- and User-supplied instrumentation)

- Max payload: 2,970 lbs. (3 crew) or 2760 lbs. (4 crew)
- Six "PMS" Canisters, 3 per wing
- Remote sensing: Two Nadir Ports, Two Zenith Ports
 - Wyoming Cloud Radar (WCR)
 - Wyoming Cloud Lidar (WCL)
- Six "minor" Zenith multi function ports
- Two zenith aerosol inlet ports (e.g., CVI, Isokinetic)
- Four belly hardpoints (two pair or in combination)
- Extended nose w/ radial mounts & nadir compartment
- Four starboard multi use ports (e.g., instrument exhaust)
- Dropsonde port

Communications

- 400A 28VDC 11.3kW Electrical Power
- 10kw 120VAC 60Hz (max, DC reduced proportionally)
- Global Satcom (200-700Kbps)
- 5G in-flight data services (domestic >3000 ft AGL)
- Gate-to-gate WiFi

Aerosol and Trace Gas Instrumentation

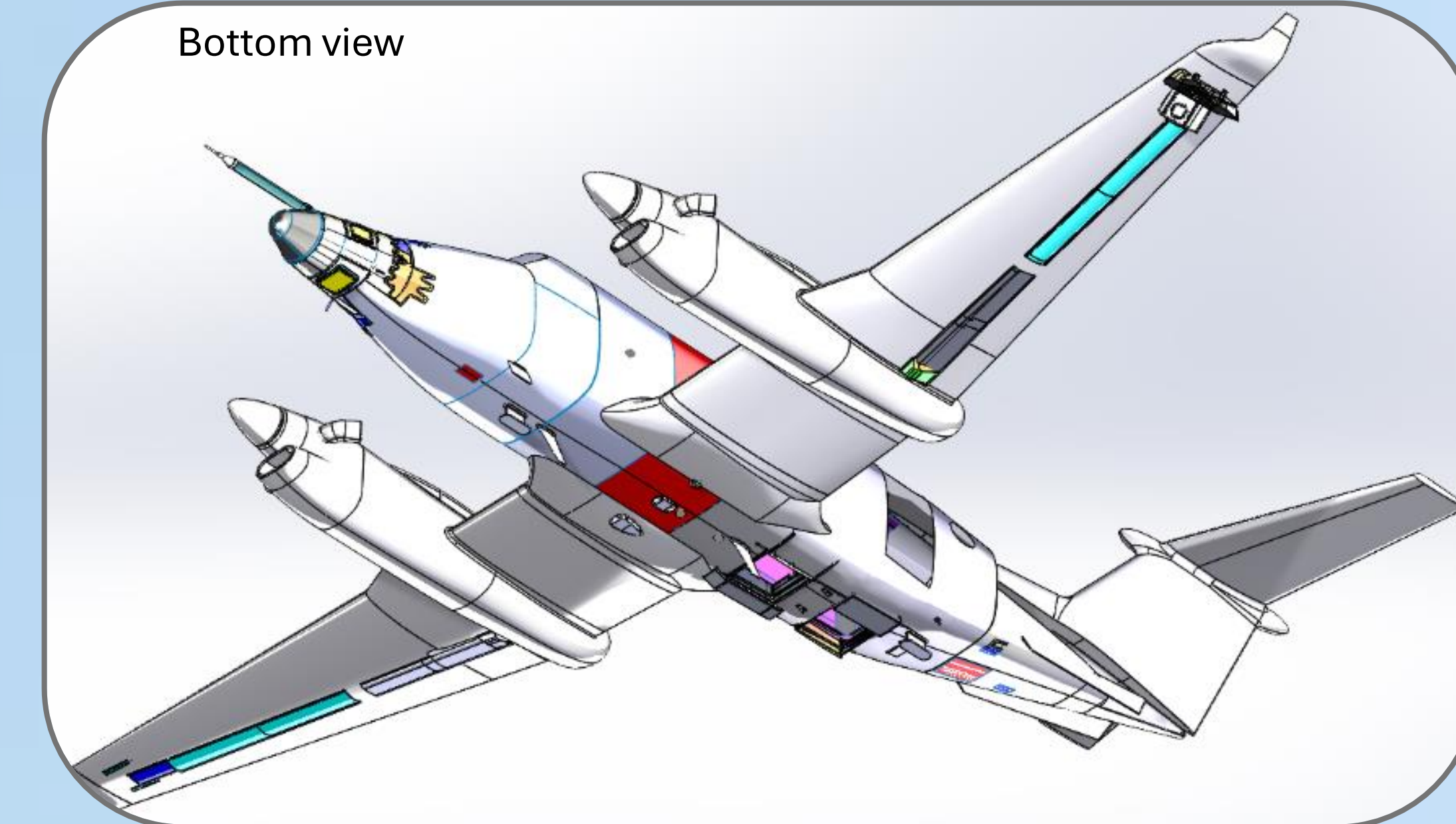
Facility Requestable Instrumentation

- **Inlets**
 - Brechtel Isokinetic Inlet
 - NCAR HILM Inlet
 - Gooseneck (various diameter, forward or reverse)
- **Aerosol Number and Size Distribution**
 - TSI CPC (greater than 0.01 μm)
 - DMT UHSAS (0.06 – 1 μm)
 - Handix POPS (0.25 – 3 μm)
 - *Black Carbon*: DMT SP2-XR (0.1 – 0.5 μm Scattering, 0.05 – 0.8 μm Incandescent, mass)
- **Wing Canister/Cloud Probes**
 - DMT PCASP-100X (0.1 – 3 μm)
 - DMT CDP (2 – 50 μm)
 - SPEC 2DS (10 μm – 1.28 mm)
- **Gas Analyzers**
 - MIRO 10-species Gas Analyzer (CO/CO₂/CH₄/H₂O/O₃/NO/NO₂/NH₃/SO₂/OCS)
 - Aeris Ultra Analyzers: CO/N₂O and C₂H₆/CH₄
 - Picarro G2401-m (CO/CO₂/CH₄/H₂O)
 - LICOR 7000 (closed) and 7500 (open) – CO₂/H₂O

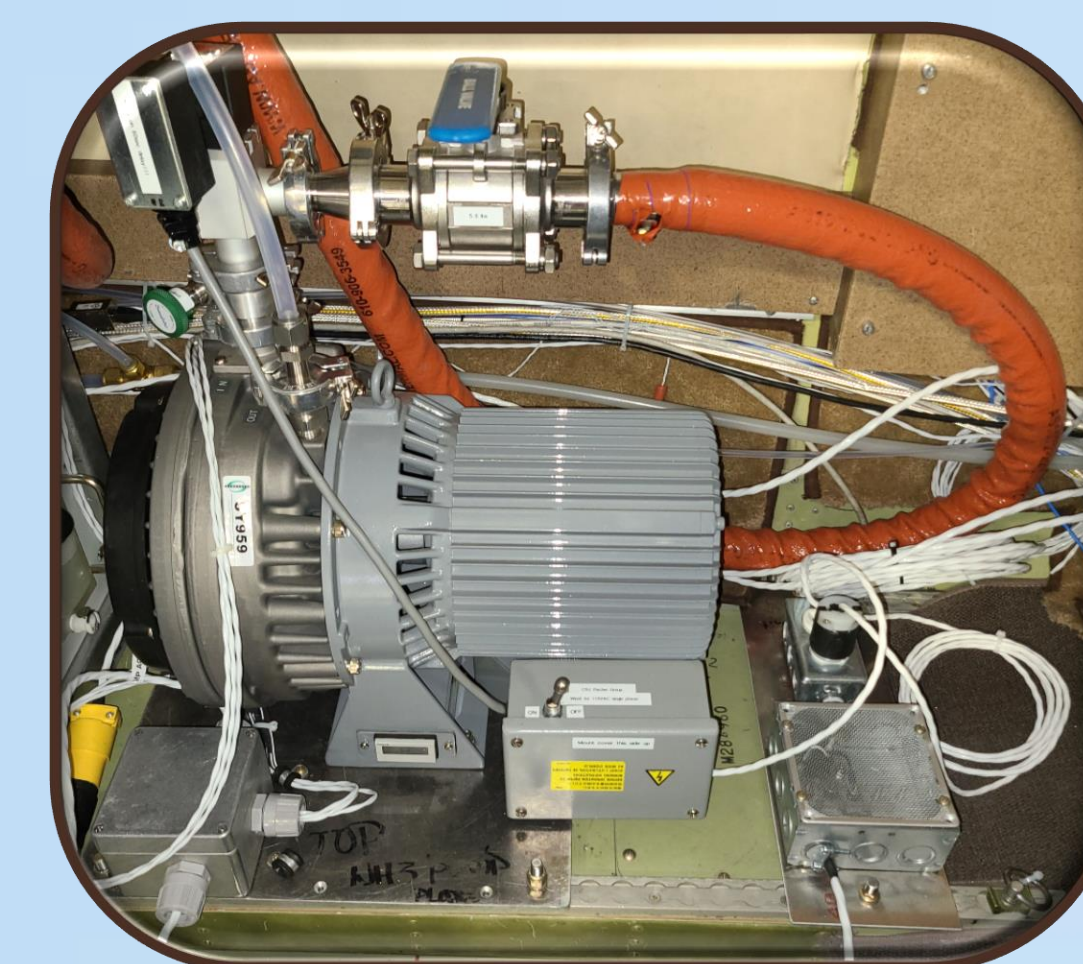
Examples of Previously Supported User-Supplied Instrumentation

- Brechtel CVI Inlet
- PILS
- CIMS
- Aerodyne QC-TILDAS (C₂H₆, NH₃, HNO₃)
- Solar Occultation Flux Spectrometer

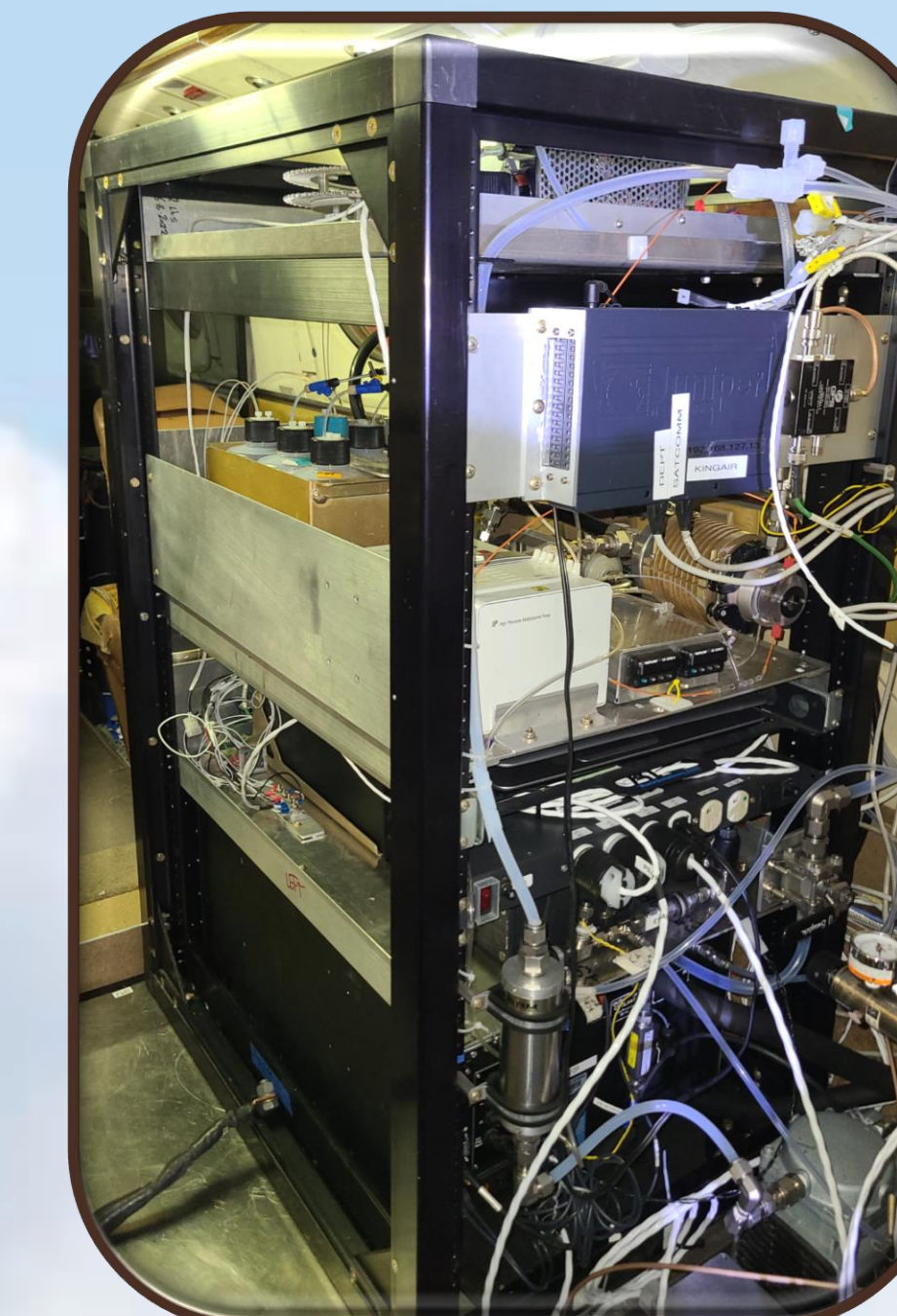
Bottom view



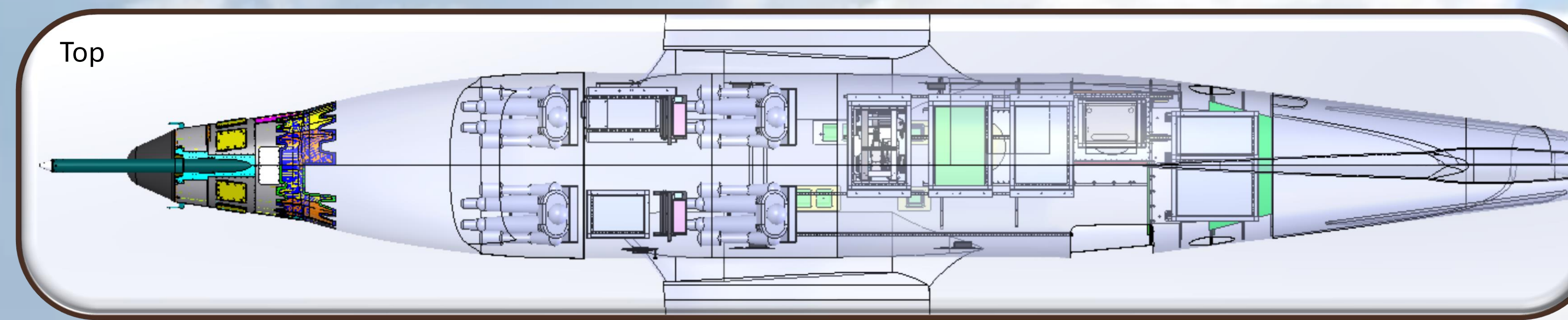
Project Payload Example:
TRANS2AM
2022



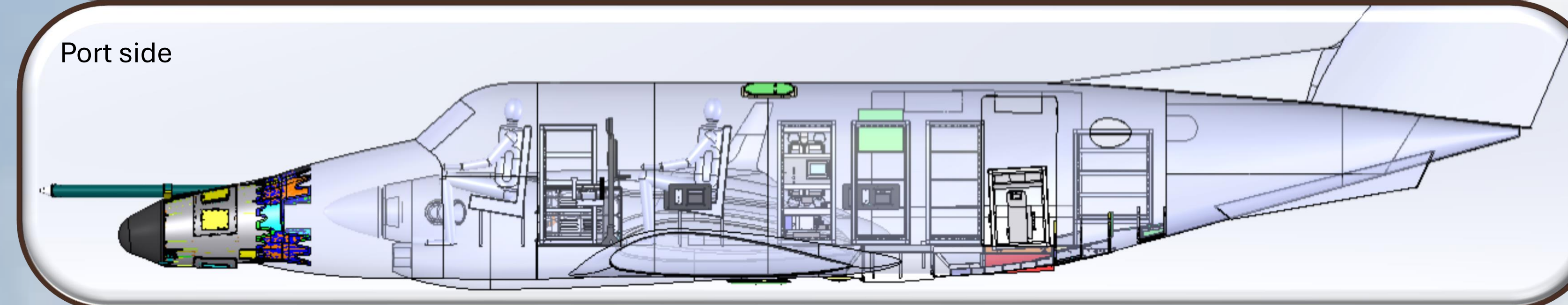
Air Chem Rack: 19" W x 29" L x 40" H



Top



Port side



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