NPS-CIRPAS Airborne Research Facility

SCOAR Meeting Update – 1Nov2023

Contact: Anthony.Bucholtz@nps.edu

Twin Otter Flying Again

•Twin Otter returned to flight on Jan 6, 2023:

- CIRPAS crew did an extraordinary job in recovering the aircraft from the smoke/water damages due to the hangar fire that occurred on the Joby Aviation side on Aug 4, 2022:
  - Twin Otter was almost completely disassembled and cleaned inside and out
  - Aircraft components were inspected, cleaned and/or replaced
  - Facility instruments were inspected and cleaned
  - Office/lab/storage spaces (furniture, equipment, etc) cleaned – ongoing
- Still dealing with the bureaucratic, legal and financial fallout from this incident

FY23 Twin Otter Missions

1. **CLASI: (**February 2023 - 3 weeks; 41 Flt hrs) - **Completed**
   - **PI:** Qing Wang, NPS
   - **Location:** Gulf Shores, AL
   - **Goal:** Effects of the atmosphere on high energy laser attenuation
   - **Sponsor:** ONR

2. **SWESARR: (Phase 1:** March 2023 - 2 weeks; 15 Flt hrs/**Phase 2:** October 2023 - 2 weeks; 26 Flt hrs) – **Completed both**
   - **PI:** Batu Osmanoglu, NASA-Goddard
   - **Location:** Fairbanks, AK
   - **Goal:** Study to remotely measure the amount of water in the snowpack in the northern Alaska region
   - **Sponsor:** NASA

3. **SCILLA: (**June 2023 - 4 weeks; 75 Flt hrs) - **Completed**
   - **PI:** Mikael Witte, NPS
   - **Location:** San Diego, CA
   - **Goal:** Quantify the impact of aerosol-cloud interactions on planetary boundary layer structure and evolution
   - **Sponsor:** ONR

4. **MAGPIE: (Phase 1:** August 2023 - 4 weeks; 75 Flt hrs) - **Completed**
   - **PIs:** Jeff Reid (NRL), Qing Wang (NPS)
   - **Location:** Barbados
   - **Goal:** Investigate processes that regulate the lower marine atmosphere, clouds, precipitation, turbulence, and composition
   - **Sponsor:** ONR

FY24 Twin Otter Missions Planned

1. **REDSAW: (**April-May 2024 - 3 weeks; 30 Flt hrs)
   - **PI:** Qing Wang, NPS
   - **Location:** Salton Sea, CA
   - **Goal:** Quantify refractivity profiles in the stable boundary layer and their impact on EM propagation over water
   - **Sponsor:** ONR

2. **MAGPIE: (Phase 2:** June-July 2024 - 4 weeks; 80 Flt hrs)
   - **PIs:** Jeff Reid (NRL), Qing Wang (NPS)
   - **Location:** Barbados
   - **Goal:** Investigate processes that regulate the lower marine atmosphere, clouds, precipitation, turbulence, and composition
   - **Sponsor:** ONR

3. **PACE-PAX: (**September 2024 - 4 weeks; 60 Flt hrs)
   - **PI:** Kirk Knobelspiesse, NASA-Goddard
   - **Location:** Marina, CA
   - **Goal:** Gather aerosol validation data for the Plankton, Aerosol, Cloud, ocean Ecosystem (PACE) satellite mission
   - **Sponsor:** NASA

4. **AirSHARP3: (**October 2024 - 2 weeks; 20 Flt hrs)
   - **PI:** Liane Guild, NASA-Ames
   - **Location:** Marina, CA
   - **Goal:** Assessment of hyperspectral aerosol optical depth and water-leaving reflectance products for PACE OCI (Ocean Color Instrument) and polarimeter validation
   - **Sponsor:** NASA

Twin Otter Upgrades

ONR Defense University Research Instrumentation Program (DURIP)

1. **New Nose Assembly**:
   - Series 400 Twin Otter long nose – **lighter**, **stronger** carbon fiber
   - **Specialized optical port hard points:**
     - Capable of mounting Wescam MX-15 or MX-20
   - **Retains instrument capabilities of current nose**

2. **New Zenith Instrumentation Port**:
   - **~20% larger** than current zenith port
   - Increased structural integrity

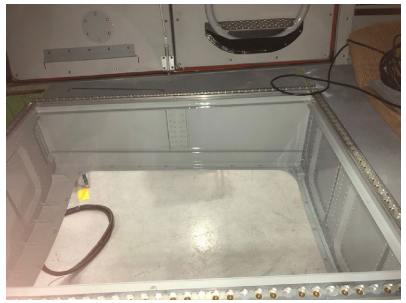
3. **New Nadir Instrumentation Port:**
   - 27” x 36” – **much larger** than current two smaller, circular ports

4. **Upgraded Electrical and Navigational Aids Package**
   - **Garmin 600 with dual flight displays**
     - Includes Attitude and heading reference system (AHRS), air data computer (ADC), dual Garmin GTN-750Xi navigators with integrated class A Terrain Awareness System (TAWS), dual Jupiter Avionics JA95 audio panels, Garmin GWX weather radar, GTX345 transponders, and GTS-855 active traffic system
     - **Increased safety and reliability of flight**
     - **Significant weight reduction** (~10% of aircraft weight)

New nose assembly

New zenith port

Garmin 600



New nadir port

Expected Completion Date: March 2024

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Questions?