

NOAA Office of Marine and Aviation Operations and Capabilities

**2026 Atmospheric River
Reconnaissance (AR Recon)
Workshop**

**Fly NOAA: A Brief Overview
CDR Priti Bhatnagar**

June 29, 2026 to July 3, 2026



**NOAA
MARINE &
AVIATION
OPERATIONS**

About Me - CDR Priti Bhatnagar



OMAO and NOAA Corps Leadership



Rear Admiral Amanda Goeller (lower half)
Deputy Assistant Administrator for
Operations, OMAO and NOAA Corps



Rear Admiral Chad Cary
Assistant Administrator, OMAO, NOAA
Corps (Senate Confirmed)



Edward Bradley
Acting Deputy Assistant Administrator for
Programs and Administration, OMAO

OMAO's Mission and Vision



Mission

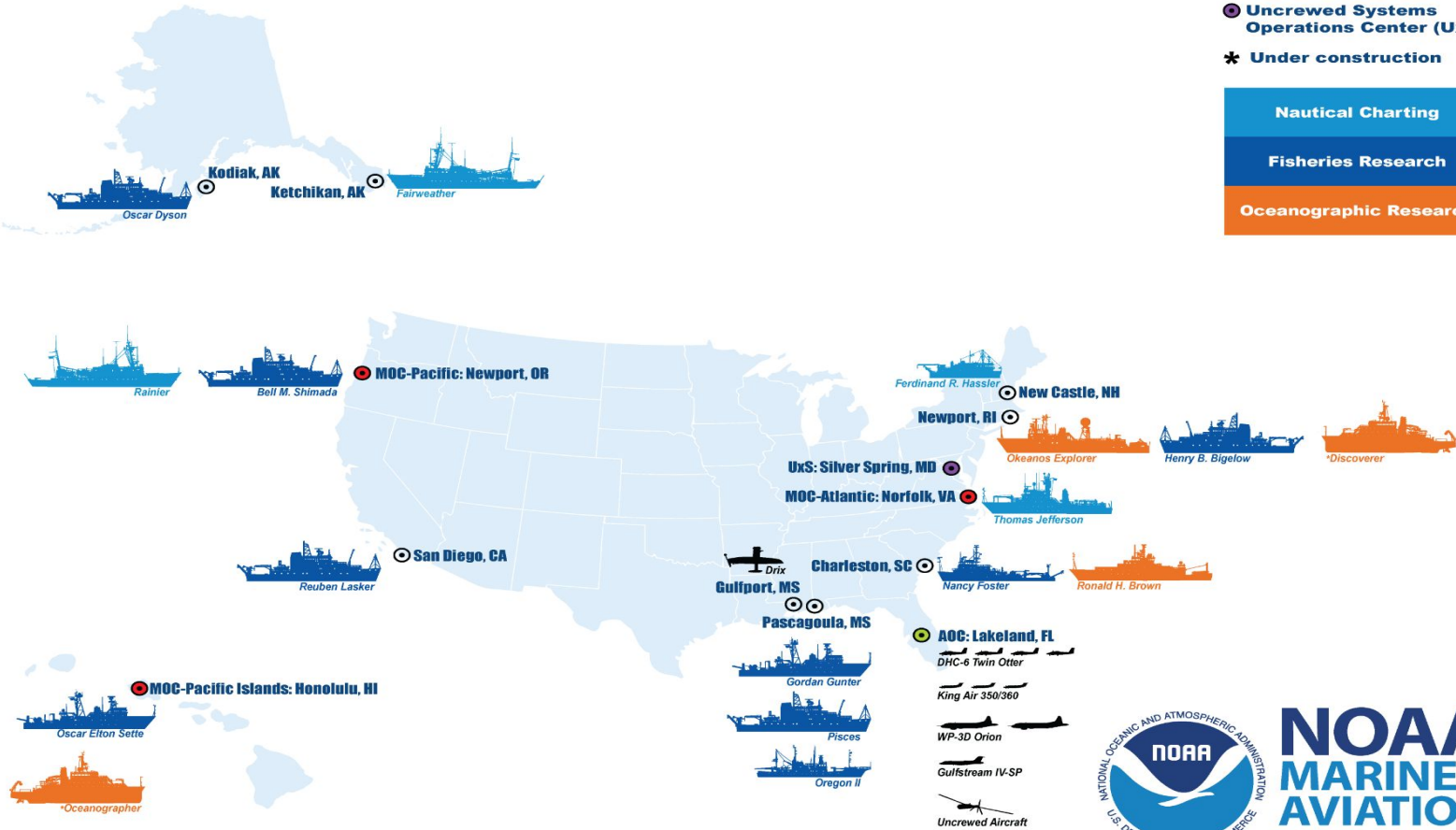
Lead, manage, and operate NOAA's specialized fleet (ships, aircraft, uncrewed systems) to deliver oceanographic and atmospheric observations vital to national safety and prosperity.

Vision

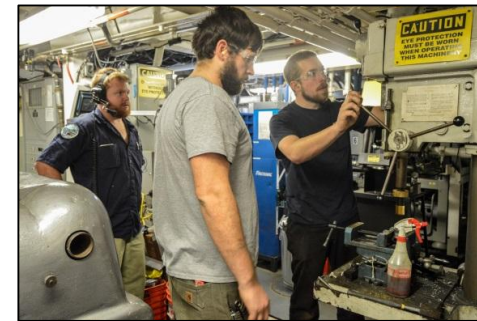
Efficiently gather environmental data to inform decision-making, promote economic growth, and protect natural ecosystems.



NOAA Fleet Operations Centers



OMAO Personnel



Aircraft Operations Center: Lakeland, FL



Our People



NOAA Commissioned Officer Corps



- One of 8 Uniformed Services in the US
- Approx. 367 Officers, no enlisted personnel
- Operational leaders and technical experts
- Serve in NOAA aircraft, ships, uncrewed operations and shoreside management and leadership positions



NOAA Twin Otter



DeHavilland DHC-6 Twin Otter (4)

- Marine mammals
- Air chemistry
- Coastal mapping
- Snow survey



Potential Instrumentation:

- Bathymetric/Micro-Doppler LiDAR
- Airborne expendable launch chute
- AIMMS-30 Air Data System
- Hyperspectral cameras



NOAA King Air



Beechcraft King Air 350/360CER (3)

- Coastal mapping
- Emergency response
- Snow survey



Potential Instrumentation

- Digital cameras
- Multispectral/hyperspectral sensor
- Topographic/bathymetric LiDAR
- Gamma radiation detectors



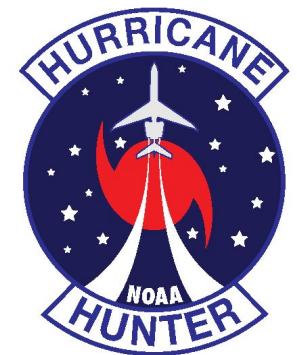
Gulfstream G-IV-SP

- High altitude hurricane surveillance (45,000 ft) and Atmospheric Rivers
- Flies above and around storm environment
- Hurricane forecasts that use G-IV data are up to 24% more accurate than forecasts without G-IV aircraft data.



Potential Instrumentation:

- Dropsonde expendables
- Tail doppler radar
- Airborne Radio Occultation



Lockheed WP-3D Orion (2)

- Fly inside the storm environment
- Boosts overall forecast accuracy by up to 20%.

Potential Instrumentation

- Various expendables
- Lower fuselage/Tail doppler radar systems
- Stepped frequency microwave radiometers

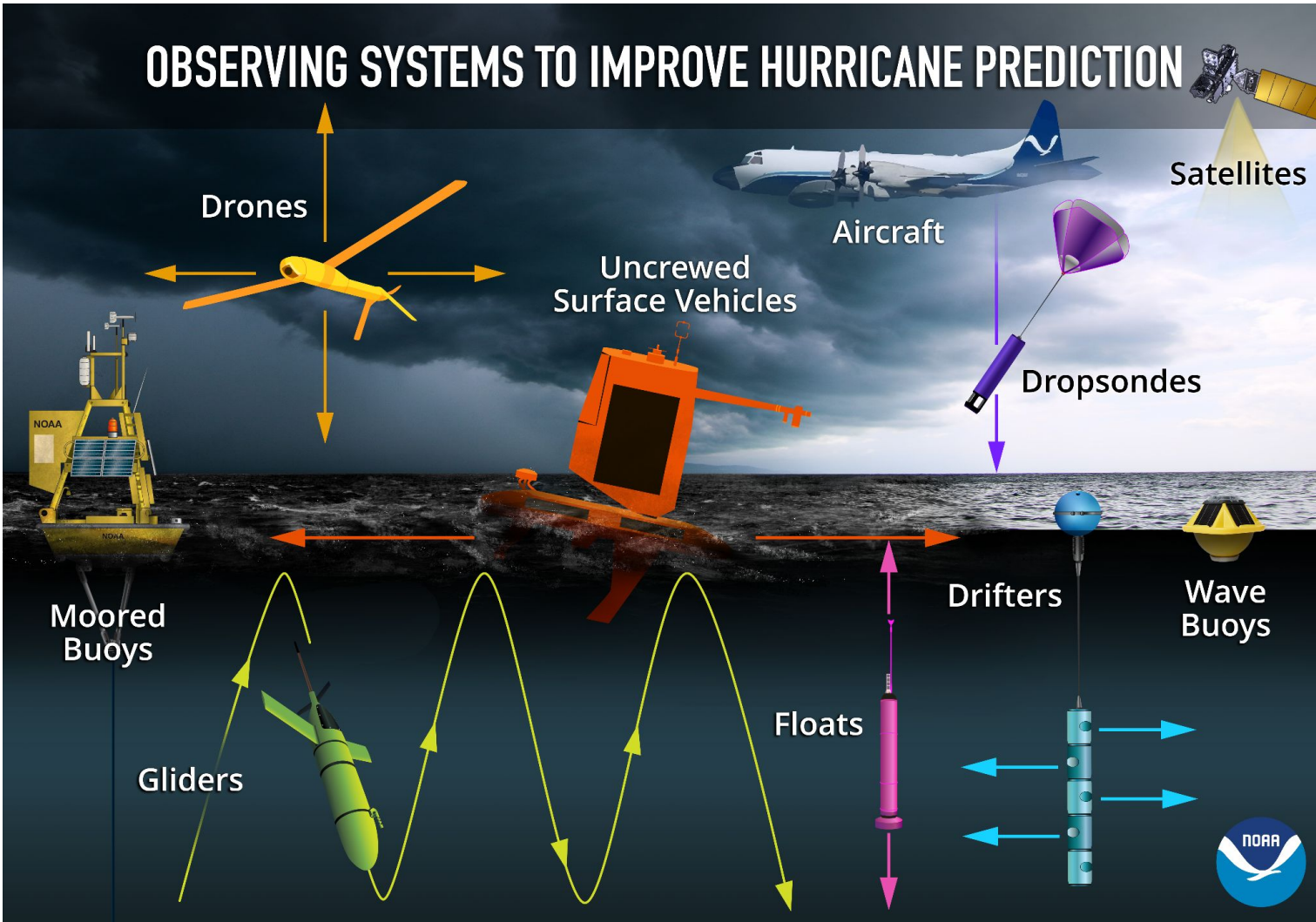


Inside Hurricane Melissa



UxS Hurricane Reconnaissance

OBSERVING SYSTEMS TO IMPROVE HURRICANE PREDICTION



UxS Weather Reconnaissance

- UxS Operations are coordinated through OMAO's Uncrewed Systems Operations Center (UxSOC)
- 3D Mesonet using UAS
 - Expanding beyond traditional weather towers and radiosondes
 - Academic and industry partners
- Emergency Response after severe weather
 - Expanding part of UxSOC's future operations



The Future of NOAA's Aircraft



- Two G550s expected to be operational in 2027 and 2028
 - Provides new high-altitude precision wind and humidity measurements for the first time
- NOAA C130J program on schedule to provide two aircraft by 2030
 - Ensures continuity of operations when WP-3Ds retire at the end of their service life, additional data transmission and safer operations around the world
- Potential areas of expansion:
 - 24-h coverage for land-threatening storms
 - Longer decision timelines
 - Expansion to 7-day forecasts
 - Concurrent multi-basin events - Gulf/East Coasts, Puerto Rico/USVI, Hawaii



Gulfstream Aerospace (Savannah, GA) G550 Aircraft



Lockheed Martin (Marietta, GA) C-130J Aircraft

C-130J Aircraft Details

- Missionized Wing-Tips (2x) (4th Hardpoints)

- Rolls-Royce Allison Turboprop engines
- GE-Dowty Aerospace Composite Propellers

- Third Wing Hardpoints (2x)

- Color weather/ground mapping radar

- Two-pilot cockpit
- Two head-up displays
- Two auxiliary crew stations (ACS)
- 1553 data bus architecture
- Four Multi-function LCDs at the ACSs



- Multi-Mode Radar
- Microwave Radiometer

- Night vision compatible lighting
- Integrated diagnostics
- Enhanced cargo handling system

- Doppler weather radar pods (2x)

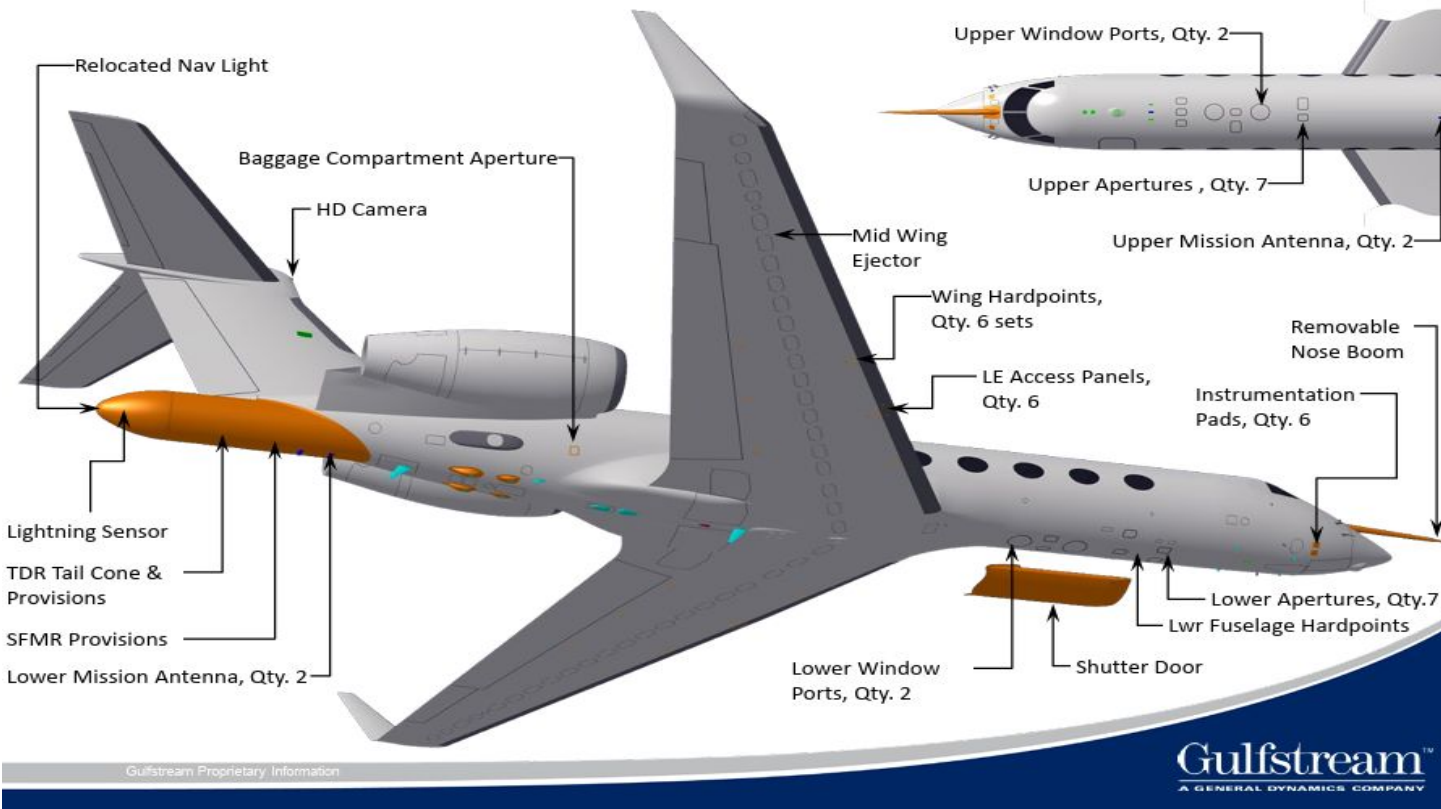
- Twelve workstations
- Four business class passenger seats
- Two business class seats with table
- Airline style lavatory and galley
- One mission 6' power rack,
- Two mission 6' equipment racks
- Ramp-mounted sonobuoy storage
- Thru-Floor Launch Tube

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Mission Capability	WP-3D NOAA	C-130J NOAA
Electrical Power	3X - 90KVA	4X - 90KVA
Wing Hard Points	10	8
Mission Stations	13	16
Oxygen	Gaseous Oxygen 3 crew only	Gaseous Oxygen 95hrs to all 23 crew
Crew Capacity	21	23
Flight Ceiling	28,000 ft	32,000 ft
Cruise Airspeed	350 kts	310 kts
Cruise Range (nm)	3,800 nm	3,000 nm
Takeoff Weight (lbs)	135,000 lbs	164,000 lbs
Payload (lbs)	N/A	40,000 lbs
Flight Level Data	Dedicated Research Instrumentation	Dedicated Research Instrumentation
Data Transfer Rates	~500kb/s	>3 Mb/s Dedicated KU band
Downward Looking Apertures	1 - 36" x 28" aperture 1 - 21" aperture 1 - 12" x 12" aperture 1 - 6" x 6" aperture	2 - 16" apertures 2 - 7" x 10" apertures 1 - 10" x 14" aperture
Upward Looking Apertures	1 - 12" aperture	2 - 7" x 10" apertures 1 - 10" x 14" aperture
Nose Radar	Collings WXR-700C	Honeywell RDR-4000
Horizontal 360 Deg Weather Radar	AN/APY-11 Multi-Mode Radar	AN/APY-11 Multi-Mode Radar
Vertical 360 Deg Doppler Radar	Tail Doppler Radar	Wing Pod Doppler Radar
Expendables	1x - Manual NRD-41 Dropsonde Launcher 1 x - Manual Single-launch AXBT (reloadable) 17x - External launch AXBT	1x - Automated NRD-41 Launcher (Capability 30-40) 8x - 7" Oversized diameter Remote Operated Expendable Launch Tubes

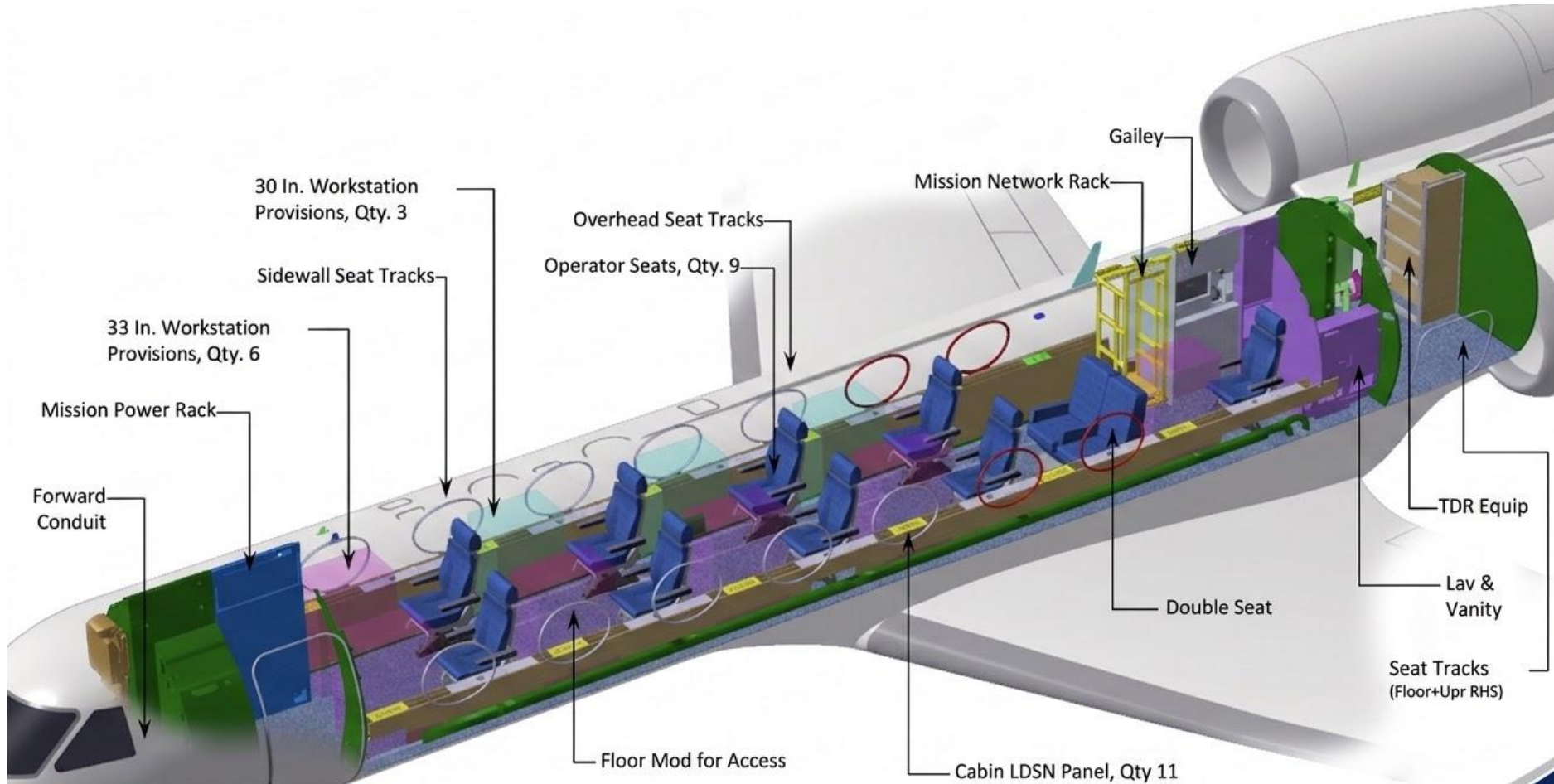
G550 Aircraft Details

Exterior Modifications



Mission Capability	NOAA G-IVSP	NOAA G550
Electrical Power	2x 40 kVA	2x 40 kVA
Wing Hard Points	0	6
Mission Stations	8	9
Crew Capacity	13	14
Flight Ceiling	45,000 ft	51,000 ft
Cruise Airspeed	.80 Mach	.85 Mach
Cruise Range (nmi)	4,220	6,750
Takeoff Weight (lbs)	74,600	91,000
Payload (lbs)	5,700	6,200
Flight Level Data	Nose ring of sensors	Nose Boom, dedicated temperature, high altitude humidity
Data Transfer Rates	~500kb/s	~500kb/s
Downward Looking Apertures	1 - 2" aperture	2 - 21" aperture 2 - 14" x 10" aperture 1 - 12" x 12" aperture 1 - 6" x 6" aperture
Upward Looking Apertures	None	2 - 21" aperture 2 - 14" x 10" aperture 5 - 7" x 10" aperture
Nose Radar	Collins WXR-700C	Honeywell Primus 880 (Honeywell RDR-7000 planned)
Horizontal 360 Deg Weather Radar	None	None
Vertical 360 Deg Doppler Radar	Tail Doppler Radar	Tail Doppler Radar
Expendables	1x Manual RD-41 Dropsonde Launcher or 1x 5.25" freefall chute (unpressurized ops only)	1x Automated NRD-41 Dropsonde Launcher (40 sonde capacity, reloadable in flight)

G550 Aircraft Details



- Mission Power: 400 Hz (some 3 ϕ), 60 Hz, 28 VDC, 28 VDC Weight-Off-Wheels
- Networks: 3ea Cat 6a, NTP, PTP
- Misc: 8 shielded twisted pairs, 2ea 50 ohm coax

G550 Aircraft Details

- Multi-use instrument aperture plates and view ports on the upper fuselage that allow install of optical glass or instrumentation – FAA Certification needs to be addressed for each new install
- The NOAA upper surface modifications include:
 - 2 Round view ports, 20.5"Ø opening
 - 5 Rectangular apertures, 7" x 10"
 - 2 Rectangular apertures, 14" x 10"
- Additional attachment points on the fuselage and in the cabin facilitate the installation of probes and equipment
- Aperture plates of common size are interchangeable



Questions?



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