

## ▣ Aircraft specifications

### General specifications

- Certified for flight into known icing conditions
- Pressurized cabin
- Two (2) Pratt & Whitney PT6A-28 turbine engines
- 620 shaft horsepower per engine
- Two (2) three blade propellers, constant-speed, reversible and fully feathering
- 34' 8" length; 12' 9" height; 42' 8" wingspan
- 374 gallons fuel capacity (Jet A)

### Weights

- 9050 lbs maximum ramp weight
- 9000 lbs takeoff weight
- 9000 lbs landing weight
- 7200 lbs zero fuel weight
- 5020 lbs typical empty weight
- 3980 lbs typical useful load

### Performance - Both Engines (Maximum Takeoff Weight)

- 283 kts max speed
- 269 kts max recommended cruise
- 75 kts stall speed in landing configuration
- 31,600 feet all engine service ceiling
- 2,710 feet per minute all-engine rate of climb
- 1980 feet for take off over 50 foot obstacle
- 1410 foot take off ground roll
- 2480 feet landing over 50 foot obstruction
- 1430 foot landing ground roll

### Performance - Single Engine (Maximum Takeoff Weight)

- 91 knots minimum control airspeed
- 14,600 feet single-engine service ceiling
- 660 feet per minute single-engine rate of climb

- **Cargo capacity** – the SOAR research aircraft is capable of carrying a load of 1000 pounds in addition to a scientific crew of four persons and maximum fuel.
- **Maximum altitude** – the maximum altitude of the SOAR research aircraft is its service ceiling at 31,600 feet for a minimum on-station time of 3.5 hours.
- **Range** - the SOAR research aircraft has a maximum range of 1200 nautical miles.
- **Endurance** - the SOAR research aircraft has an endurance of 5 hours at scientific payload.
- **Rate of climb** – the climb capability of the SOAR research aircraft at ISA carrying the scientific payload is 2000 feet per minute.
- **Research power** – The aircraft main power is connected to a main DC buss through a Cutler Hammer Relay, then to the Main Power Cable connected to a Power Distribution Rack Case which contains switch breakers for individual system components including de-icing power and 115V AC power. The research power available on the 28V DC

supply is 6.7kW and on 115V AC supply is 1kW.

- **Hard points** – The SOAR research aircraft is modified with two hard points (one per wing). The following design describes the specifications of each wing hard point:

**Maximum Weight:** 60 pounds

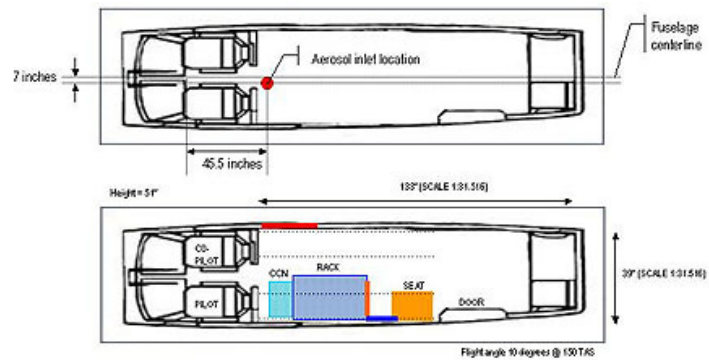
**Center of Gravity:** FS 137.0, BL 178.625

**Maximum Moment Arm to Wing Undersurface:** 10.4 inches

**Equivalent Flat Plate Drag Area:** 0.07 square feet

Skin doublers in the wing undersurface and in the fuselage are designed for a variety of probes and an air inlet port for air sampling inside the pressurized cabin.

- **Crew** – the aircraft crew consists of a pilot, a data system operator and up to two scientific observers. An instrument technician usually accompanies the crew in the field.
- **Research speed** - the SOAR research aircraft has a research speed of 70 to 100 m/s. This speed can be adjusted to fulfill each research task.



**Dimensions:**

Length from aft side of spar to aft side of seat rails: 75"

Length from aft side of seat rails to forward side of aft baggage: 28"

Aft baggage: L-30",W-39.5",H-42.5" forward and 36" at aft pressure bulkhead

Cabin: H-51",W-39.5" at floor level and 50" at arm rest level

Door: H-45" and W-27"

Instrument rack: L-32",W-19",H-40"

Width between seat rails (width between rows): 14.5"

Width between side of cabin and seat rail: 2" at floor level,4" at seven inches above the floor.

..... Seat rails      Data system monitor      Emergency exit      CCN Monitor