

*Twin Otter*  
SERIES 400

# Twin Otter Series 400



**VIKING**   
VERSATILITY THAT WORKS

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In 1965, de Havilland Canada developed the DHC-6 Twin Otter aircraft – a high winged, un-pressurized twin engine turbine powered aircraft with fixed tricycle land gear. Designed as a rugged Short Take Off and Landing (“STOL”) commuter, the Twin Otter was capable of carrying passengers and cargo into remote unimproved locations, including ski and water based operations. The aircraft were sold around the world to customers operating in the harshest environments, including sub-zero Antarctica, the hottest deserts of North Africa, the mountainous regions of the Himalayas, and the open water of the Indian Ocean archipelagos. A testimony to its rugged construction and incredible STOL performance, the Twin Otter became the best-selling 19 passenger aircraft of all time, still unmatched for its dependability and versatility.

The de Havilland Twin Otter experienced a production span of twenty-three years before the line was officially shut down in 1988, after a total of 844 aircraft were delivered. The “Legacy fleet”, as it is now known, has remained in active use since the program end,

carrying out jobs no other aircraft can do; in 2001, the Twin Otter was chosen as the only aircraft capable of performing an emergency evacuation flight of a critical patient from the South Pole under extreme -60 degree conditions.

This ability to reliably operate in any environment with minimal maintenance requirements has kept the legacy fleet at the forefront of niche markets around the world. It is often said that the only thing that can replace a Twin Otter is another Twin Otter, which explains the high demand in the market to keep the nearly 600 remaining legacy aircraft in operation.

In 2005, Viking purchased the Type Certificates for all of the out-of-production de Havilland aircraft (DHC-1 through DHC-7), including the Twin Otter. After an extensive market analysis was conducted, it was determined that an overwhelming demand existed to bring the Twin Otter back into production, thus the Viking Series 400 Twin Otter Production Program was announced in 2007.

The Series 400 Twin Otter picks up where the original de Havilland Series 300 Twin Otter left off, introducing upgraded Pratt & Whitney PT6A-34 engines, fully integrated Honeywell Primus Apex digital avionics suite, use of composite materials, and approximately 800 other modifications incorporated to improve upon the original production model. However, like its predecessor, the Series 400 Twin Otter retains the ability to operate from remote and unimproved airfields due to its robust design, equalized maintenance program, and dependability of the Pratt & Whitney engines.

Available on standard land gear, optional straight or amphibious floats, skis, wheel skis, or intermediate flotation gear (“IFG”), with multiple quick-change interior configurations available, the Series 400 Twin Otter is a versatile aircraft that can be utilized for multiple roles, such as regional commuter, environmental monitoring, parachute operations, cargo and infrastructure support, corporate shuttle, crew carrier, charter operations, and personal private use.

A military variant of the Series 400, the Twin Otter Guardian 400, has also been developed for missionization and varied Government operations. Offered as a versatile airframe that can be customized for unique configuration requirements, the Guardian 400’s low acquisition cost and flexible architecture allows operators to mix and match sensors and interior layouts to meet their specific mission profiles.

To date, Viking has sold Twin Otter Series 400 aircraft to military, commercial, corporate, and private operators in 26 countries around the world. The future promises to be exciting with continued aircraft deliveries, increasing the worldwide fleet of owners and operators who contribute to the ongoing de Havilland legacy every day.

**Combining a proven design with modern technology, the new Viking DHC-6 Twin Otter Series 400 will provide owners and operators with “Versatility That Works”.**





### GENERAL INFORMATION:

Max. Takeoff Weight: 12,500 lbs. (5,670 kg.)  
 Max. Landing Weight: 12,300 lbs. (5,579 kg.)  
 Number of Crew: 1 or 2  
 Number of Passengers: 19  
 Fuel Capacities:  
 Total – 378 US Gallons (1,432 litres)  
 Optional Long Range – 89 US Gallons (336 litres)

### CABIN DIMENSIONS:

**Cabin Length:** 18 ft. 5 in. (5.61 m)  
**Cabin Height:** 4 ft. 11 in. (1.50 m)  
**Cabin Width:** 5 ft. 9 in. (1.75 m)  
**Cabin Volume** (usable): 384 cu. ft. (10.87 cu. m)  
**Cabin Doors** (left side):  
 50 in. X 56 in. (1.27 m x 1.42 m)  
**Cabin Door** (right side):  
 30 in. X 45.5 in. (.76 m x 1.16 m)

### ENGINES:

Two, Pratt & Whitney Aircraft of Canada Limited, PT6A-34, single stage, free-turbine engines.

### AIRFRAME:

**Configuration and Construction:**  
 All metal, non pressurized, high-wing monoplane with fixed tricycle (steerable nose) landing gear.

### PROPELLERS:

Two Hartzell HC-B3TN three bladed reversible pitch, constant speed, fully feathering propellers.

### BASIC GREEN AIRCRAFT WEIGHT:

7,100 lbs. (3,221 kg.)

### PERFORMANCE SUMMARY:

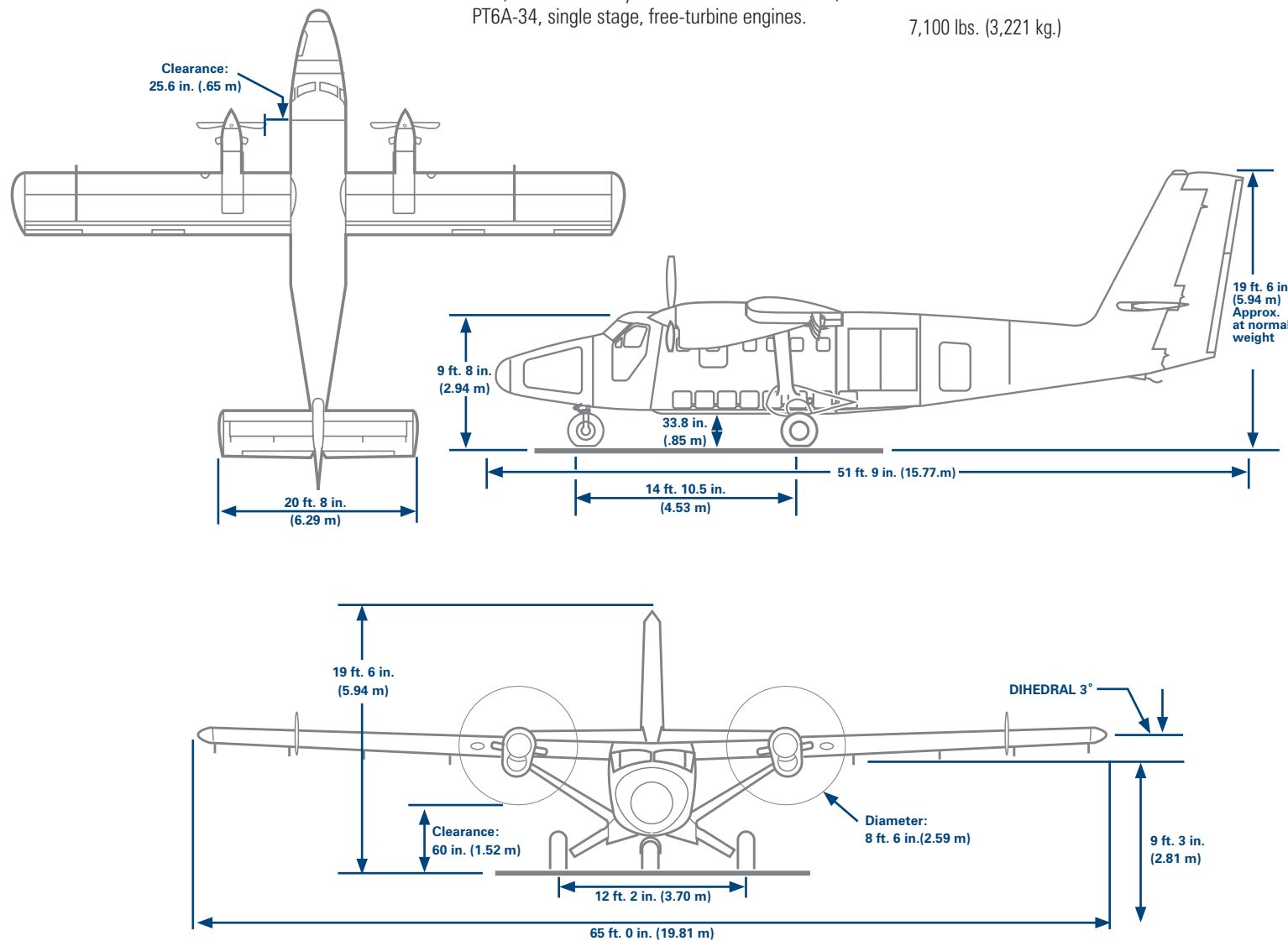
- STOL Takeoff and Landing Distance**  
 Takeoff distance to 50 ft.: 1,200 ft. (366 m)  
 Landing distance from 50 ft.: 1,050 ft. (320 m)
- Maximum Cruise Speeds, TAS**  
 Sea Level: 170 kt  
 5,000 ft.: 181 kt  
 10,000 ft.: 182 kt
- Enroute Rate of Climb at Sea Level**  
 (both engines at max. climb power): 1,600 ft./min
- Service Ceiling (Rate of climb 100 ft/min)**  
 (both engines at max. climb power): 25,000 ft. (7,620 m)
- Fuel Burn at Economy Cruise**  
 146 KTAS at 10,000 ft.: 468.2 lbs./hour (0.311 nm/lb of fuel)
- Payload Range – at max cruise speed**  
 Payload for 100 nautical mile (185 km) range: 4,061 lbs. (1,842 kg.)  
 Payload for 400 nautical mile (741 km) range: 3,031 lbs. (1,375 kg.)
- Maximum Range (Zero Payload)**  
 With standard tankage (2,576 lbs. (1,169 kg.) fuel): 799 nm (1,480 km)  
 With long range tankage (3,190 lbs. (1,447 kg.) fuel): 989 nm (1,832 km)
- Maximum Endurance**  
 With standard tankage (2,590 lbs. (1,175 kg.) fuel): 6.94 hrs.  
 With long range tankage (3,190 lbs. (1,447 kg.) fuel): 8.76 hrs.

### DIRECT OPERATING COSTS PER FLIGHT HOUR:

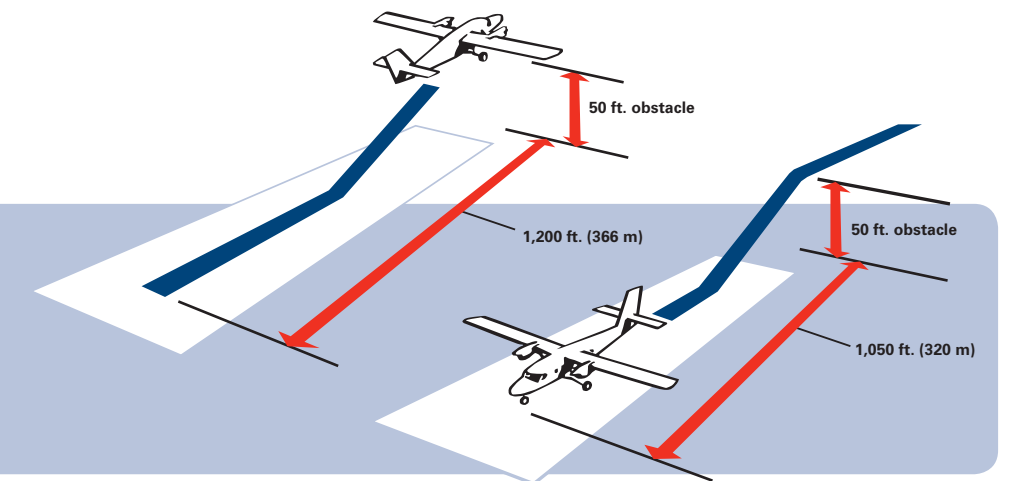
Fuel Cost <sup>1</sup> .....	\$517.24
Airframe and Propeller Maintenance <sup>2</sup> .....	\$139.58
Engine Restoration Cost <sup>3</sup> .....	\$180.50
<b>TOTAL DIRECT OPERATING COST</b> .....	<b>\$837.32</b>

### DIRECT OPERATING COST ASSUMPTIONS AND SOURCES:

- Fuel**  
 Fuel cost is based on an average ground speed of 165kts and typical sector fuel burn of 575lb per hour at a fuel cost of \$6 per US Gallon. For a higher ground speed of 175kts, a typical sector fuel burn of 640lbs should be used.
  - Airframe and Propeller Maintenance**  
 Airframe and propeller maintenance cost assumes an annual utilization of 1200 flight hours (FH) and a cycle to FH ratio of 2. It is based on a combination of labor costs and parts costs as follows:  
**Labor:** Based on the aircraft maintenance schedule, labor cost assumes a preventative maintenance Man Hour (MH) per flight hour ratio of 0.948, plus a 10% allowance for corrective maintenance MH. Assuming a labor rate of \$87/MH, this equates to a total of \$90.72 per flight hour.  
**Parts:** Preventative maintenance parts of \$18.86 per flight hour (based on the aircraft maintenance schedule) and corrective maintenance parts of \$30.00 per flight hour (based on Conklin and De Decker estimates), for a total of \$48.86 per flight hour.
  - Engine Restoration**  
 This covers engine overhaul and component life costs based on Viking Air estimates of typical overhaul costs and current overhaul, HSI and component life limits.
- Additional Variable Cost Allowances** (provided by Conklin & DeDecker - highly dependent on country/use):  
 Landing and Parking..... \$13.87  
 Crew..... \$70.24  
 Supplies and Catering..... \$51.06



### SHORT TAKE OFF AND LANDING ("STOL") PERFORMANCE







### AIRFRAME

- Airstair Door
- Cargo Door
- 19 Seat Commuter Interior
- Rear Baggage Compartment
- Forward Baggage Compartment
- Corrosion Prevention Primer

### POWER PLANT

- PT6A-34 Engines
- Hartzell Three Blade Propeller

### ENGINE FIRE DETECTION

- Fire Detecting
- Fire Extinguishing

### VENTILATION

- Heating System
- Temperature Control System
- Cabin Gasper Vents
- Passenger Gasper Vents

### ELECTRICAL

- 28 Volt DC
- Main Battery
- External Power
- No AC Electrical

### GROUND HANDLING

- Towing Provisions
- Jacking Provisions
- Hoisting Provisions
- Tie-Down Provisions
- Leveling Provisions

### PNEUMATIC SYSTEM

- Bleed Air System
- Low Pressure Pneumatic System

### FUEL SYSTEM

- Two Fuel Filling Positions, Nine Tanks
- Fuel Pumps
- Digital Fuel Quantity Indicating System
- Fuel Low Level Warning
- Boost Pump Low Pressure Warning
- Fuel Flow Indication
- Fuel Heater
- Fuel Control Unit Purge Valve
- Additional Water Drain Valves
- Fuel Cross Feed Indicating System

### INSTRUMENTS

- L3 ESIS with independent battery backup

### LANDING GEAR

- Fixed Wheel Gear
- Cleveland Wheel Brakes

### LIGHTING

- Flight Compartment LED Lights
- Passenger Compartment LED Lights
- Cargo and Service Compartment Lights
- Taxi Lights
- LED Position Lights
- Anti Collision Lights
- LED Landing Lights
- Wing Inspection Lights
- Pulsing Landing Light System

### HYDRAULIC SYSTEM

- Wing Flaps
- Wheel Brakes
- Nose Steering Mechanism

### STANDARD AVIONICS

- Honeywell Primus Apex® Integrated Avionics System
- Left and Right Primary Flight Displays with Controllers
- Situational Awareness Display
- Systems Status Display with ECAS
- Multifunction Controller
- Flight Guidance Controller
- Integrated Aural Warning System with Spoken Alerts
- Reversion and Display Dimming Control Panel
- Dual Channel ADAHRS
- Dual Audio Panels
- Dual Multimode Digital Radios, with VHF Comm, VHF Nav, ADF, and Glideslope
- Dual GPS with SBAS Capability
- Dual DME
- Dual Mode S EHS Transponders with ADS-B Out Capability
- Radar Altimeter
- Class A Terrain Warning (Honeywell MK VI EGPWS)
- TCAS I Traffic Advisory System
- Honeywell RDR 2000 Weather Radar
- Crew Intercom
- Dual David Clark Noise Cancelling Headsets
- Jacks for Third (Observer) Headset at Flight Compartment
- Cabin Public Address System
- 406 Mhz ELT with Latitude and Longitude Transmission
- L3 Electronic Integrated Standby Instrument System
- Thommen Chronometer
- Eye Height Reference Device
- Integrated Central Maintenance Computer Function
- 4 Channel CVR
- Dual 14 Volt Convenience Outlets in Flight Compartment
- Flight Director (delayed introduction, available 2015)

### AIRFRAME

- External Paint
- Bubble Windows
- Cockpit Sunvisor System
- Air Operable Door
- Forward Cargo Door and Boarding Ladder
- External Break-in Markings
- 2nd Language Internal Markings
- 2nd Language External Markings
- Third Rail Seat Tracks

### ALTERNATE LANDING GEAR

- Wipline 13000 Straight and /or Amphibious Floats
- Intermediate Flotation Landing Gear
- Wheel-Ski Installation

### FLOAT OPERATIONS

- Float / Amphib Installation & Airframe Mod Kit
- Prop Pitch Latches
- Stainless Steel Flight Control Cables
- Marine Radio

### FUEL SYSTEM

- Long Range Wing Tip Tanks
- Extended Range Internal Fuel Tank

### EQUIPMENT / FURNISHINGS

- VIP Interiors
- Thirteen Seat Utility Interior
- Camera Provisions
- Lavatory Installation
- Galley Installation
- Stretcher / Litter Racking
- Leather Seat Covers
- Coin Mat Flooring

### ICE AND RAIN PROTECTION

- Full Airframe De-ice Package
- Propeller De-icing
- Heated Windshields

### AIR CONDITIONING

- Air Conditioner

### ELECTRICAL

- Cabin Emergency Lighting System
- 28V DC Plug-Ins, Rear Cabin

### OXYGEN SYSTEM

- Crew Oxygen System
- Passenger Oxygen System

### MISSIONIZATION

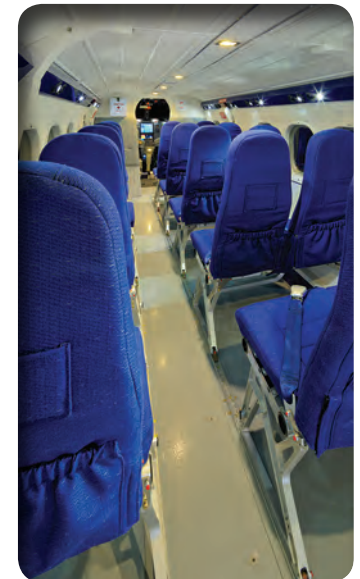
- See Guardian 400 section for details

### OPTIONAL AVIONICS

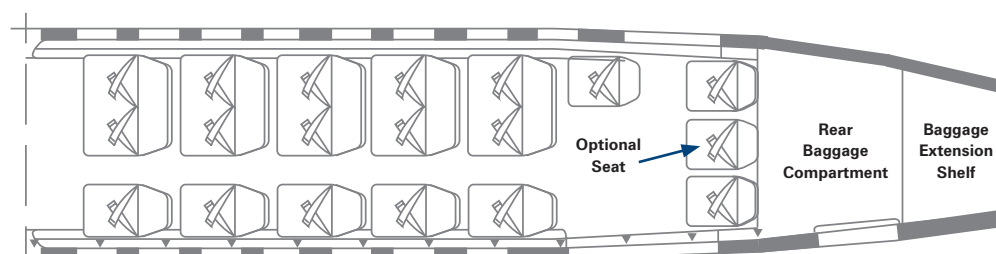
- 256 word per second FDR
- Second ADF receiver
- Second Radar Altimeter
- Third VHF
- Third VOR/ILS
- TCAS II (upgrade from TCAS 1)
- Electronic Checklists
- Display of Jeppesen Terminal Charts
- HF Radio
- Convenience Outlets in Passenger Cabin
- Third Crewmember (Loadmaster or Cabin Attendant) Intercom Station
- Passenger Intercom Stations

### FUTURE OPTIONS

- 3 Axis Autopilot
- AOA Indicator
- Honeywell RAAS (Runway Awareness and Advisory System)
- Coupled LNAV and VNAV
- LPV Approach Capability
- Honeywell Smart View (Synthetic Vision)
- Remote Video Input to Multifunction Display



### STANDARD 19 SEAT CONFIGURATION



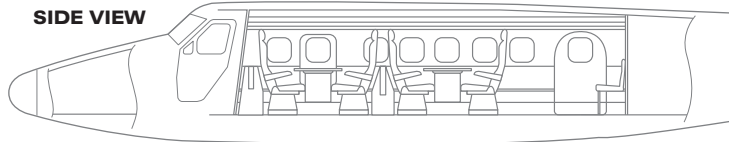


The Twin Otter Series 400 features multiple interior configurations that are easily interchangeable with optional 3rd seat rail installation.

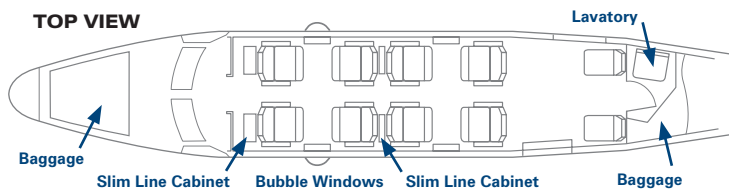
### VIP CONFIGURATION

- Double VIP Club
- Slim Line Cabinets
- 2 Standard Seats
- Aft Lavatory

SIDE VIEW



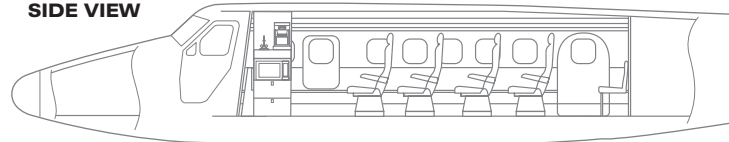
TOP VIEW



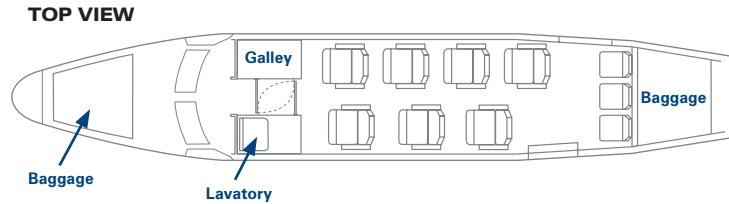
### EXECUTIVE CONFIGURATION

- 7 Forward Facing VIP Seats
- Galley
- 3 Standard Seats
- Forward Lavatory

SIDE VIEW



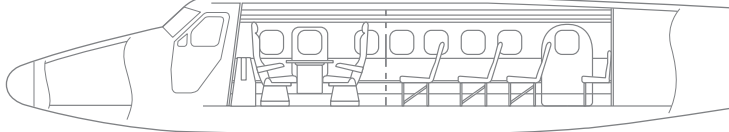
TOP VIEW



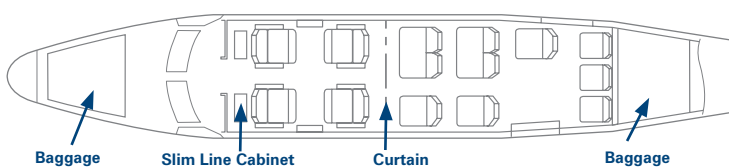
### CORPORATE SHUTTLE CONFIGURATION

- Single VIP Club
- Slim Line Cabinets
- 10 Standard Seats

SIDE VIEW



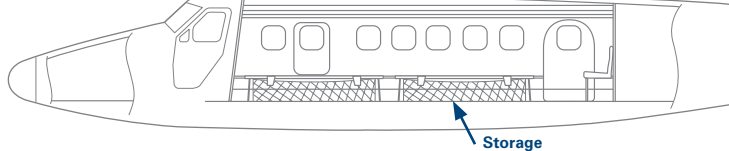
TOP VIEW



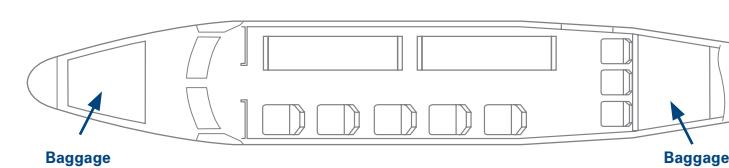
### MEDICAL EVACUATION CONFIGURATION

- 1 or 2 Single Stretchers
- 8 Standard Seats

SIDE VIEW



TOP VIEW

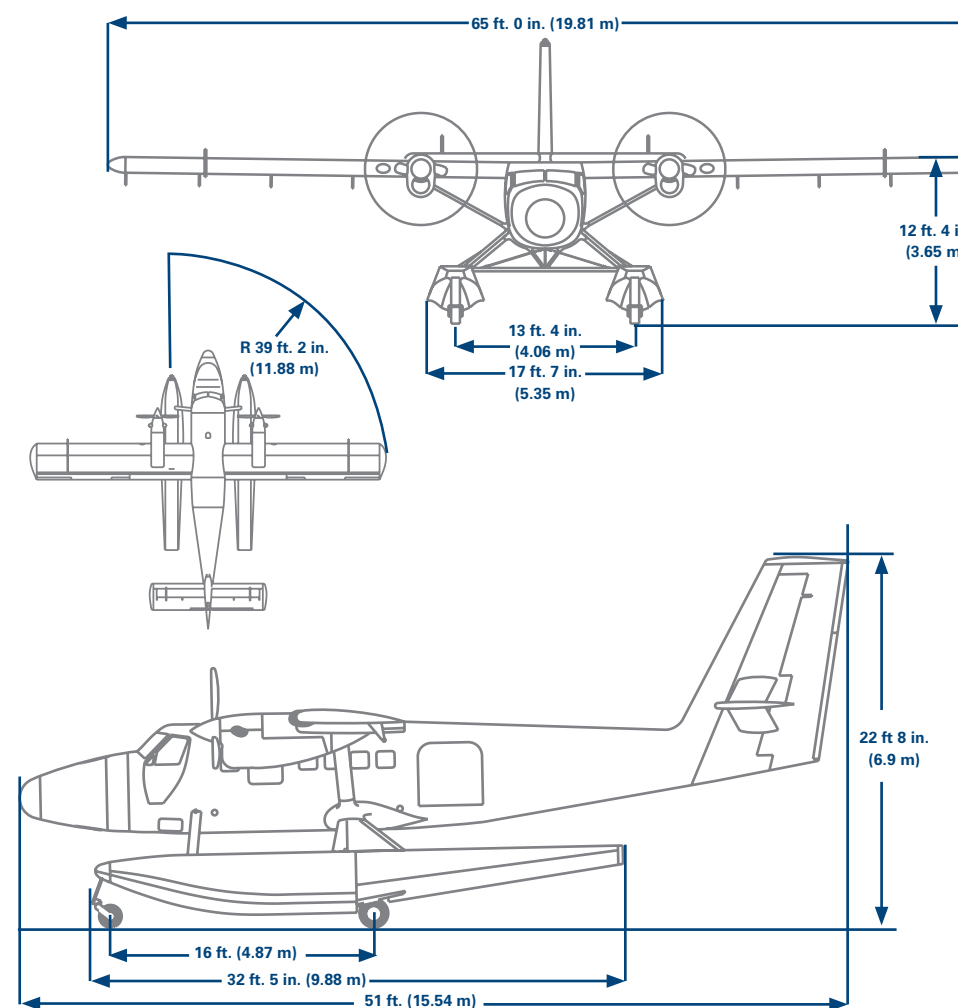




The Twin Otter is renowned for its ability to perform in a multitude of environments, providing operators with versatility in a single platform. When equipped with seaplane or amphibious floats, the Twin Otter can reach remote waterfront destinations while still exhibiting STOL (Short Take Off & Landing) capabilities. The unique design of the retractable landing gear in the amphibious floats allows the Twin Otter flexibility from both land and water based operations in a single flight plan.

Wipline 13000 floats feature fluted hull design with deadrise bottoms and extra buoyancy to provide superior handling in high seas and wind, while the flat wide top decks and built-in steps make boarding safe for crew and passengers. To further improve safety, the floats are designed and installed so an emergency no-flap landing is not only possible but uneventful.

The Twin Otter configured with Wipline floats has been proven worldwide, from the lakes and coastline of the Canadian north to the open water conditions of the Maldives archipelago, and is the aircraft of choice for operations requiring water access.



### WEIGHT

- **Amphibian System Total Weight:** 2,141 lbs. / 971 kg.
- **Amphibian Exchange Weight:** 1,490 lbs. / 676 kg.
- **Seaplane System Total Weight:** 1,452 lbs. / 659 kg.
- **Seaplane Exchange Weight:** 849 lbs. / 385 kg.
- **Gross Weight:** 12,500 lbs. / 5,670 kg.

### FLOAT DIMENSIONS

- **Length:** 32'5" / 9.88 m
- **Height – hull:** 3'9" / 1.14 m
- **Width – hull:** 4'3" / 1.3 m
- **Float Locker capacity (each):** 50 lbs. / 22.7 kg.

### DISPLACEMENT ON FRESH WATER

- **Amphibious (100%):** 12,442 lbs. / 5,644 kg.
- **Amphibious (80%):** 13,824 lbs. / 6,270 kg.
- **Seaplane (100%):** 12,844 lbs. / 5,826 kg.
- **Seaplane (80%):** 14,271 lbs. / 6,473 kg.

### PERFORMANCE

- **Engine PT6A-34**
- **Take off run (land):** 1,333 ft. / 406 m
- **Take off over 50 ft obstacle (land):** 1,843 ft. / 562 m
- **Take off run (water):** 1,227 ft. / 374 m
- **Take off over 50 ft obstacle (water):** 1,965 ft. / 599 m
- **Rate of climb (per min):** 1,400 ft. / 427 m





# On Target For Any Mission...

The Guardian 400 is the cost effective solution for 21st century surveillance, search & rescue, and critical infrastructure support due to its low acquisition and operating costs, flexible architecture, and ability to be configured with a variety of sensors and interior layouts to suit the operator's specific mission profiles.

A medium-range platform based on the Twin Otter Series 400 aircraft, the Guardian 400 can be outfitted with an electro-optical and infrared imaging

turret, 360 degree digital colour radar system, extended range internal patrol tank, four crew observation stations, air operable cargo door, search light, galley, and lavatory.

Designed for extreme operating environments, the Guardian 400 can be equipped with wheels, skis, or floats with a gross weight increase to 14,000lbs\*, allowing for additional fuel and extended range for operational sorties over ten hours in duration.



# Guardian 400



## GENERAL INFORMATION:

**Max. Takeoff Weight:** 14,000 lb (6350 kg.)\*  
**Number of Crew:** 1 or 2, cockpit and 4 observer stations  
**Fuel Capacities:** Belly Tanks – 378 US Gallons (1,432 litres)  
 Tip Tanks – 89 US Gallons (336 litres)  
 Internal Patrol Tank – 185 US Gallons (700 litres)

## BASIC GREEN AIRCRAFT WEIGHT:

7,100 lbs. (3,221 kg.)

## AIRFRAME:

**Configuration and Construction:** All metal, non pressurized, high-wing monoplane with a fixed tricycle (steerable nose) landing gear.

## CABIN DIMENSIONS:

**Cabin Length:** 18 ft. 5 in. (5.61 m)  
**Cabin Height:** 4 ft. 11 in. (1.50 m)  
**Cabin Width** (at floor): 4 ft. 4 in. (1.32 m)  
**Cabin Volume** (usable): 384 cu. ft. (10.87 cu. m.)  
**Cabin Doors** (left side): 50 in. X 56 in. (1.27 m x 1.42 m)  
**Cabin Door** (right side): 30 in. X 45.5 in. (.76 m x 1.16 m)

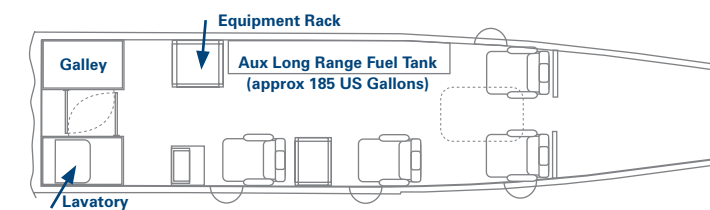
## ENGINES:

Two, Pratt & Whitney Aircraft of Canada Limited PT6A-34 single stage, free-turbine engines.

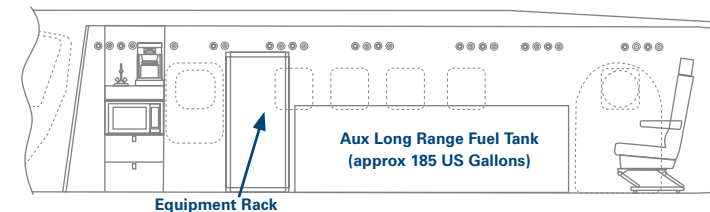
## PROPELLERS:

Two, Hartzell, HC-B3TN, three bladed reversible pitch, constant speed, fully feathering propellers.

## INTERNAL LAYOUT



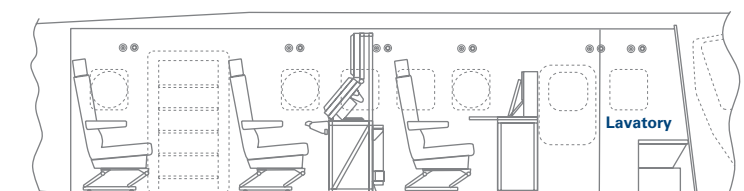
## RIGHT SIDE INTERNAL VIEW



## PERFORMANCE SUMMARY:

- **STOL Takeoff and Landing Distance**  
 Takeoff distance to 50 ft.: 1200 ft. (366 m)  
 Landing distance from 50 ft.: 1050 ft. (320 m)
- **Maximum Cruise Speeds, TAS**  
 Sea Level: 170 kt | 5000 ft.: 181 kt | 10,000 ft.: 182 kt
- **Enroute Rate of Climb at Sea Level**  
 (both engines at max. climb power): 1600 ft./min
- **Service Ceiling (Rate of climb 100 ft/min)**  
 (both engines at max. climb power): 25,000 ft. (7,620 m)
- **Fuel Burn at Economy Cruise**  
 146 KTAS at 10000 ft.: 468.2 lbs/hour (0.311 nm/lb of fuel)
- **Payload Range** (at max. cruise speed operating under 14000 lbs restricted category):  
 Payload for 100 nautical mile (185 km) range: 5,561 lbs. (2,522 kg.)  
 Payload for 400 nautical mile (741 km) range: 4,531 lbs. (2,055 kg.)
- **Maximum Range (Zero Payload)**  
 With standard tankage (2,576 lbs. (1,169 kg.) fuel): 799 nm (1,480 km)  
 With long range tip tanks (3,190 lbs. (1,447 kg.) fuel): 980 nm (1,832 km)  
 With internal patrol tank (4,451 lbs. (2,019 kg.) fuel): 1,380 nm (2,556 km)
- **Maximum Endurance**  
 With standard tankage (2,590 lbs. (1,175 kg.) fuel): 6.94 hrs.  
 With long range tip tanks (3,190 lbs. (1,447 kg.) fuel): 8.76 hrs.  
 With internal patrol tank (4,451 lbs. (2,019 kg.) fuel): 12.58 hrs.

## LEFT SIDE INTERNAL VIEW



## MISSIONIZATION OPTIONS:

- |   |                            |
|---|----------------------------|
| Internal Fuel Patrol Tanks                  | Air Operable Bi-Fold Door  |
| EO / IR Sensor / FLIR / MX15                | Parachute Interior         |
| 250 Amp Generator                           | NVG Compatible Flight Deck |
| Tactical Radios                             | Search Light               |
| Search Radar                                | SLAR                       |
| Air Operable See-Through Roll Up Cargo Door |                            |

NOTE: All data is preliminary and subject to change without notice. Dimensions are approximate only and may vary depending on aircraft configuration selected and loading conditions. \*12,500lbs is the Transport Canada maximum take off weight (MTOW) - 14,000lbs MTOW restricted category for military/government operations with local airworthiness approval. This configuration is used by the Canadian & US Military, and several other countries.





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# In Operation Around the World







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