TWIN OTTER GUARDIAN 400



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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 designed for government and military operations in extreme environments, the Guardian 400 comes equipped with an electro-optical and infrared imaging turret, 360 degree digital colour radar system, extended range fuel tanks, crew observation station, and lavatory.

Based on the Viking Twin Otter Series 400 aircraft, the Guardian 400 shares the same multi-role versatility and can be equipped with wheels, floats (straight or amphibious), skis, or intermediate flotation gear, and with a gross weight increase to 14,000lbs*, has larger payload for extended range and endurance for operational sorties up to ten hours in duration.

PRODUCT INFORMATION

GENERAL INFORMATION:

Max. Takeoff Weight: 6350 kg.* Basic Seating Configuration: 1 or 2 flight crew (cockpit), one observer station, and two crew seats (aft). Standard Fuel Capacity: 1,768 litres (belly & tip tanks)

BASIC GREEN AIRCRAFT WEIGHT: 3,221 kg.

AIRFRAME:

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

CABIN DIMENSIONS:

Cabin Length: 5.61 m Cabin Height: 1.50 m Cabin Width (at floor): 1.32 m Cabin Volume (usable): 10.87 cu. m Cabin Doors (left side): 1.27 m x 1.42 m Cabin Door (right side): .76 m x 1.16 m

ENGINES:

Two, Pratt & Whitney Canada Corp. PT6A-34 single stage free-turbine engines.

PROPELLERS:

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

PERFORMANCE SUMMARY:

STOL Takeoff and Landing Distance: Takeoff distance to 50 ft.: 366 m Landing distance from 50 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) 7,620 m

Fuel Burn at Economy Cruise: 146 KTAS at 10000 ft.: 468.2 lbs/hour (0.311 nm/lb of fuel)

Ferry Range:

(operating under 14000 lbs restricted category): Ferry range (with reserves) at 10,000 ft. cruise altitude: 1,100 nautical miles

Optimum ferry range (with reserves & use of oxygen): 1,300 nautical miles

Surveillance Range & Endurance:

Surveillance distance at 5,000 ft. altitude (with reserves): 970 nautical miles

Surveillance time on station with 100Nm transit to/from (with reserves): 7 hours

Maximum Endurance:

With standard tankage (1,447 kg. fuel): 8.76 hrs.

With optional internal patrol tank (2,019 kg. fuel): 12.58 hrs.

NOTE:

The Guardian 400 is certified by Transport Canada under Supplemental Type Certificate (STC) for approved modifications.

*MTOW is 14,000 lbs. (6,350 kg.) when the aircraft is configured as a landplane, and 13,600 lbs. (6,169 kg.) when configured with amphibious floats.

Data is preliminary and subject to change without notice.



The baseline Guardian 400 internal layout consists of a single operator work station in the forward cabin complete with console, fully adjustable operator seat, and observation windows, providing an ergonomic work environment that

incorporates logical placement of mission system equipment and controls. Two rear cabin bulkhead mounted crew seats and aft lavatory are also included in the Guardian 400 baseline interior.



PRODUCT INFORMATION

STANDARD EQUIPMENT:

Unless stated otherwise, the baseline Guardian 400 aircraft will include all standard equipment of the basic configuration Viking Twin Otter Series 400, as well as the following "Guardian 400" specific equipment:

- Matte black or dark grey (single colour) full coverage paint scheme
- Twin Otter Series 400 standard Honeywell Primus Apex avionics suite with the addition of the IFR operations bundle, ART 2000 weather radar, and the following systems:
 - Single Honeywell / Bendix King KHF-1050 radio with control head in the flight deck
 - Single Wulfsberg RT-5000 V/UHF radio with control head in operator console
 - A DO-160D/178B/170 certified Digital Voice Communications System
- Selex SeaSpray 5000E Multi-Role Electronically Scanned Search Radar
- **Either** FLIR PolyTech UltraForce 350 OR the Wescam MX-15HDi EO/IR sensor equipment
- CarteNav AIMS-ISR Data Management System (DMS) to integrate & control mission sensors
- Two (2) 28 VDC 250 Amp Starter Generators (replaces standard 200 Amp Starter Generators equipped in Series 400)
- Addition of electrical bus to supply the various mission sensors and equipment
- A single forward operator work station with console & fully adjustable operator seat
- 3rd Seat Rail Installation
- Two crew observation windows
- Two fold up seats in aft cabin mounted on rear bulkhead
- Lavatory (rear installation)
- Long range fuel tanks (wing tip tanks)
- Cabin lighting modified to provide separate controls for operator consoles and cabin passenger sections.
- Each console equipped with a map light & switch located in the console control panel

COMMUNICATIONS:

The Guardian 400 comes equipped with a DO-160D/178B/170 Digital Voice Communications System (DVCS) integrated as part of the communications suite. The DVCS provides one Audio Control Unit (ACU) for each member of the flight crew, and one ACU for the sensor operator console. The sensor operator console will also have one phone jack and one microphone jack installed as standard equipment.

The DVCS also features two separate Interphone Communication System loops, allowing the flight crew to communicate with the sensor operating crew and passengers (under normal operations), and the option to separate the flight deck loop from the cabin loop for uninterrupted flight deck communications.

CARTENAV AIMS-ISR DATA MANAGEMENT SYSTEM:

The Guardian 400 is equipped with a CarteNav AIMS-ISR Data Management System (DMS) to control and integrate the mission sensors. The CarteNav DMS is an operator-centric mission system which has been designed to meet real-world mission requirements refined with thousands of hours of operational feedback. The system includes powerful pre-mission planning and post-mission analysis tools as well as COTS hardware.

The CarteNav DMS is a software system that allows multiple operators to work together on a shared local operating system, while individual workstations maintain their own user interface, map views and optimal system settings best suited for individual tasks. The AIMS-ISR system's highly configurable graphical user interface, flexible mapping engine, powerful data management tools, sensor display, controls, and ability to process high definition video all work in combination to improve overall mission efficiency.



360° SEARCH RADAR:

The Selex SeaSpray 5000E Multi-Role Electronically Scanned Search Radar is the baseline search radar system for the Guardian 400, installed in the nose section with the system antenna located in a radome underneath the nose cone to facilitate 360° rotation, suitable for both amphibious and landplane configurations of the Guardian 400.

EO/IR SENSOR:

The ITAR free FLIR PolyTech UltraForce 350, or the Wescam MX-15HDi, are the two available baseline options for standard EO/IR equipment on the Guardian 400. The retractable EO/IR sensor turret is located on the underside of the nose cone, providing an excellent field of view for the cameras and avoiding significant potential blanking effect from wings, engines, propellers and floats that is unavoidable when the EO is installed further aft.

Retraction of the turret is important to protect the camera lenses, particularly when the aircraft is equipped with floats and exposed to sea spray during maneuvering and take-off runs. In addition, retraction of the turret reduces aircraft drag and fuel burn when not in operation.

EO/IR OPTION A - ULTRAFORCE 350:

The UltraForce 350 system features a 350mm (13.8") gimbal with 4-axis gyro stabilization, with standard sensor payloads including:

- Thermal imager with a 640 x 512 focal plane array operating in the 3.75 4.8 microns wavelength and with field of view ranging from 17° x 12.5° (Wide) to 0.6° x 0.45° with electronic zoom.
- Visible TV sensor providing 380,000 pixels (NTSC) or 400,000 pixels (PAL), and a 26 x zoom ratio with field of view ranging from 42° (maximum wide) to 0.8° with electronic zoom.
- Optional payloads for the UltraForce 350 include laser rangefinder and spotter camera.

EO/IR OPTION B - L-3 WESTCAM MX-15HDI:

The L-3 Wescam MX-15HDi system has a 394mm (15.5") gimbal with 4 axis stabilization and steering, as well as 6-axis passive vibration isolation. The turret can be equipped with up to 6 camera payloads, including:

- High magnification IR thermal imager
- Daylight camera with zoom lens
- Daylight camera with spotter lens
- Day/night spotter with dual channel spotter
- Eye safe laser rangefinder
- Laser illuminator



SELEX SEASPRAY 500E









L-3 WESTCAM MX-15HDI

CUSTOMIZE YOUR MISSION

ADDITIONAL COMMUNICATIONS AND TRANSMISSION SYSTEMS:

The Guardian 400 can be equipped with additional communications equipment such as:

- Dual Honeywell/Bendix King KHF-1050 HF radios
- Dual Wulfsberg RT-5000 V/UHF radios
- Satcom radios
- Mission specific radios and aircraft compatible cell phones
- A Data Link system, such as the Enerlinks III. This data link operates via either L-band or C-band and interfaces to a stationary or mobile ground station. The system can simultaneously compress and transmit one or two streams of HD video, or one to four streams of SD video over a single downlink. The Enerlinks III also offers IP Gateway/Bridge connectivity between the aircraft and ground networks.

ALTERNATE SEARCH RADAR SYSTEMS:

Alternate search radar systems can be installed as specified customer options. For radar systems with large antennas sizes, an installation under the rear fuselage may preferable to the standard installation underneath the aircraft nose section.

SLAR SYSTEM:

The Guardian 400 can be equipped with a SSC SLAR system with dual antennas, installed either in lieu of or supplemental to the baseline search radar. With dual radar systems installed, the aircraft can utilize the SLAR system to monitor illegal dumping of pollution from a ship while the baseline search radar keeps the vessel under continuous tracking.

ALTERNATE EO/IR SYSTEMS:

The EO/IR retract mechanism in the Guardian 400 can accommodate alternate EO/IR systems up to a turret diameter of 420mm (16.5"). This includes common systems such as:

- FLIR PolyTech UltraForce 350
- FLIR Systems Star SAFIRE 380
- L-3 Wescam MX-15i
- Raytheon AVES EO/IR
- Zeiss Leo II

The Guardian 400 can also accommodate larger fixed installation EO/IR systems such as the L3 Wescam MX-20 or the Zeiss Leo III.

ALTERNATE DATA MANAGEMENT SYSTEMS:

Alternate Data Management Systems can be installed in the Guardian 400 aircraft and integrated with the selected mission equipment suite.

ELINT SYSTEM:

The Guardian 400 can be equipped with an Electronics Intelligence (ELINT) system that can provide wideband microwave search and intercept, interferometric direction finding with GIS mapping.

AUTOMATIC IDENTIFICATION SYSTEM (AIS):

An Automatic Identification System (AIS) can be installed as optional equipment on the Guardian 400. AIS transponders continually exchange information through an advanced VHF data link network, providing a reliable and secure communication channel with minimal manual involvement. The selected AIS will interface with the aircraft's Data Management System for information display and correlation.

DIRECTION FINDER:

The Guardian 400 can be equipped with a Direction Finder/ Homing system, such as the Cobham 935 series Direction Finder (DF), for homing in on distress frequencies. The system covers three standard distress frequencies in addition to providing the ability to tune to any frequency between 30 and 470 MHz. The DF system interfaces with the baseline Data Management System, and can be displayed on the Flight Deck Multi-Function Display for flight crew situational awareness.

SEARCH LIGHT:

The Guardian 400 can be equipped with an externally mounted steerable search light such as the Trakkabeam A800. The search light can be controlled manually, or maneuvered via the Data Management System.

FIXED CAMERA SYSTEMS:

The Amphibious configured Guardian 400 can be equipped an Optech T-7200 downward looking camera and/or Optech T-4800 oblique interline camera located in the aft lower fuselage, complete with sliding door for protection during take-off and landing.

IDENTIFICATION FRIEND OR FOE (IFF):

The Guardian 400 can be equipped with a customer-furnished IFF transponder system.

LINK YE MK II DATA LINK:

The Guardian 400 can be equipped with a Link YE MK II Data Link system. The data link will operate via the HF and V/ UHF radios to interface with other Link YE equipped assets, including Link YE equipped ground stations.

SELF PROTECTION SYSTEM:

The Guardian 400 can be equipped with a Saab Civil Aircraft Missile Protection System (CAMPS). The CAMPS system is designed to provide protection from Man Portable Air Defence Systems (MANPADS), and includes missile warning sensors and CIV-IR decoys. The system provides rapid, accurate detection and tracking data of approaching missiles, and is complimented with an additional sensor for hemispherical coverage. The Self Protection system is managed via a control panel mounted in the flight deck.

VIKING

OPTIONAL EQUIPMENT

In addition to the standard equipment listed on pages 4 -5, the Guardian 400 can be customized with any Twin Otter Series 400 available options and a variety of mission specific options, including:

- Customized paint scheme
- Dual language placards
- Second operator work station
- Auxiliary equipment rack
- Galley
- SAR equipment storage unit
- Custom provisions for various hand held mission equipment such as still camera, video camera, portable communications unit, binoculars additional fire extinguishers, etc.
- NVG compatible cabin lighting system
- Flight crew oxygen system, flight crew/mission Crew/passenger, or solid state (emergency) oxygen systems
- Air-operable inward opening bi-fold or roll up door (parachute and/or air drop operations)
- Air conditioning system with routable ducting for components and sensors
- 3-axis Autopilot system with an integrated yaw damper
- Extended capacity 'wet wing' fuel system
- Structural provisions for various large capacity belly mounted payloads (heavy duty cargo pod or pod for oil dispersant spraying system)
- Large capacity cargo pod
- Oil dispersant spraying system
- Internal patrol tank (700 litres)
- 14V or 28V DC electrical outlets in cabin
- 4th crew intercom jack at STN 332
- Various landing gear options: amphibious floats, straight floats, water bombing floats, intermediate floatation gear (large wheels), skis or wheel-skis.
- Various interior layout options available inquire for details
- Various additional optional missions equipment available – inquire for details



OPTIONAL INTERIORS

The Guardian 400 can be readily reconfigured between various approved interior layouts as a basic maintenance function, with custom interior layouts available for additional work stations, auxiliary equipment racks, galley, life raft storage unit etc. depending on specific mission profiles. Below are examples of approved interior layouts for the Guardian 400:

UTILITY PASSENGER SEATING:

The Guardian 400 can be quickly reconfigured from Surveillance configuration to multi-role passenger configuration, or standard 19-passenger seating (below)by removing the console operator seat(s) and folding away the work shelf.

19 PASSENGER CONFIGURATION

Lavatory



EMERGENCY MEDEVAC CONFIGURATION:

Provisions can be made to accommodate stretchers in the Guardian 400 for emergency medical evacuation. Stretchers can be installed in "bunk" arrangement on either side of the aircraft, leaving the forward work station and two rear utility seats of the baseline configuration. Stretcher capacity can also be increased to 8 by removing the console operator seat and folding away the work shelf.

INSTALLATION OF DUAL LIFEPORT PLUS MEDEVAC SYSTEM:

A dual LifePort Patient Loading Utility System[™] (PLUS) medical stretcher system can be installed in tandem configuration on the RH side of the Aircraft using quick release seat rail mounting adapter (see diagram). Each LifePort PLUS unit consists of an advanced life support base unit and AeroSled[®] stretcher containing medical components.





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