Aircraft Operating Manual

Not for real world use

Contents

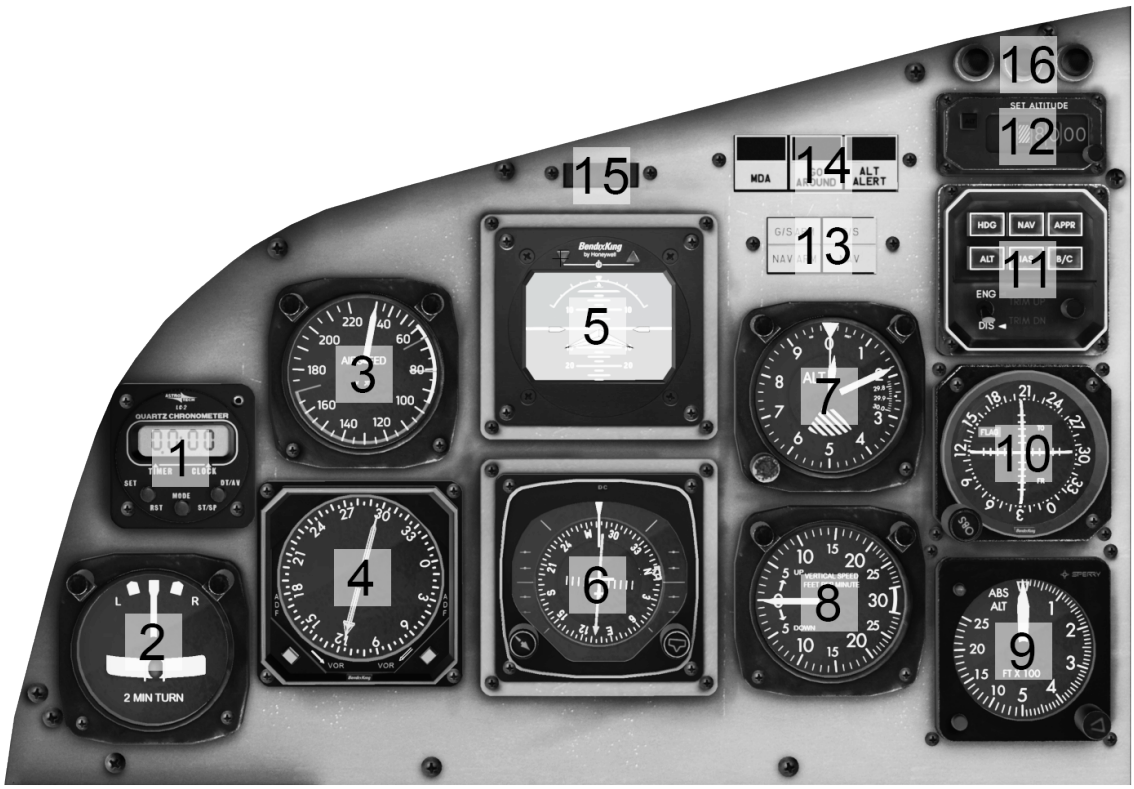
General

The de Havilland Canada DHC-6 'Twin Otter' is a STOL (short take-off and landing) aircraft. The aircraft is used in nearly all parts of the world as a cargo, regional airliner, MEDEVAC and is favored by skydiving operators.

Built from 1965 till 1985, the aircraft was favored in bush terrain and is still used by companies to get to very remote locations. The series 300 was introduced in 1969. This version had more powerful 680 hp engines (Pratt and Whitney Canada PT6A-27). The 300 series proved to be the aircrafts most popular version with 614 aircraft being sold before it's production ended in 1988.

Flight Crew:	1-2
Seating:	20
Length:	15.77 m
Wingspan:	19.8 m
Height:	5.9m
Empty weight:	3,363 kg
MTOW:	5,246 kg
Maximum landing weight:	5,579 kg
Maximum speed:	170 kts
Cruise speed:	150 kts
Stall speed:	58 kts (landing configuration)
Range:	1,434 km
Maximum fuel capacity:	1421 L
Service ceiling:	25,000 ft

Captain Panel Overview



1. Chronometer

- Chronometer that toggles between zulu time and a timer. To start and stop the timer, press the ST/SP button. To reset the timer, press the RST button.

2. Turn and Slip Indicator

- Indicates a 2 minute turn if the needle is over either the left or right marker.

3. Airspeed Indicator

4. RMI

- ADF2 does not function.

5. Artificial Horizon

6. Horizontal Situation Indicator

7. Altimeter

8. Vertical Speed

9. Decision Height

- Decision height can be changed via the DH SET knob. The DH light will illuminate when altitude is below the selected height

10. VOR

11. Autopilot

12. Altitude Set

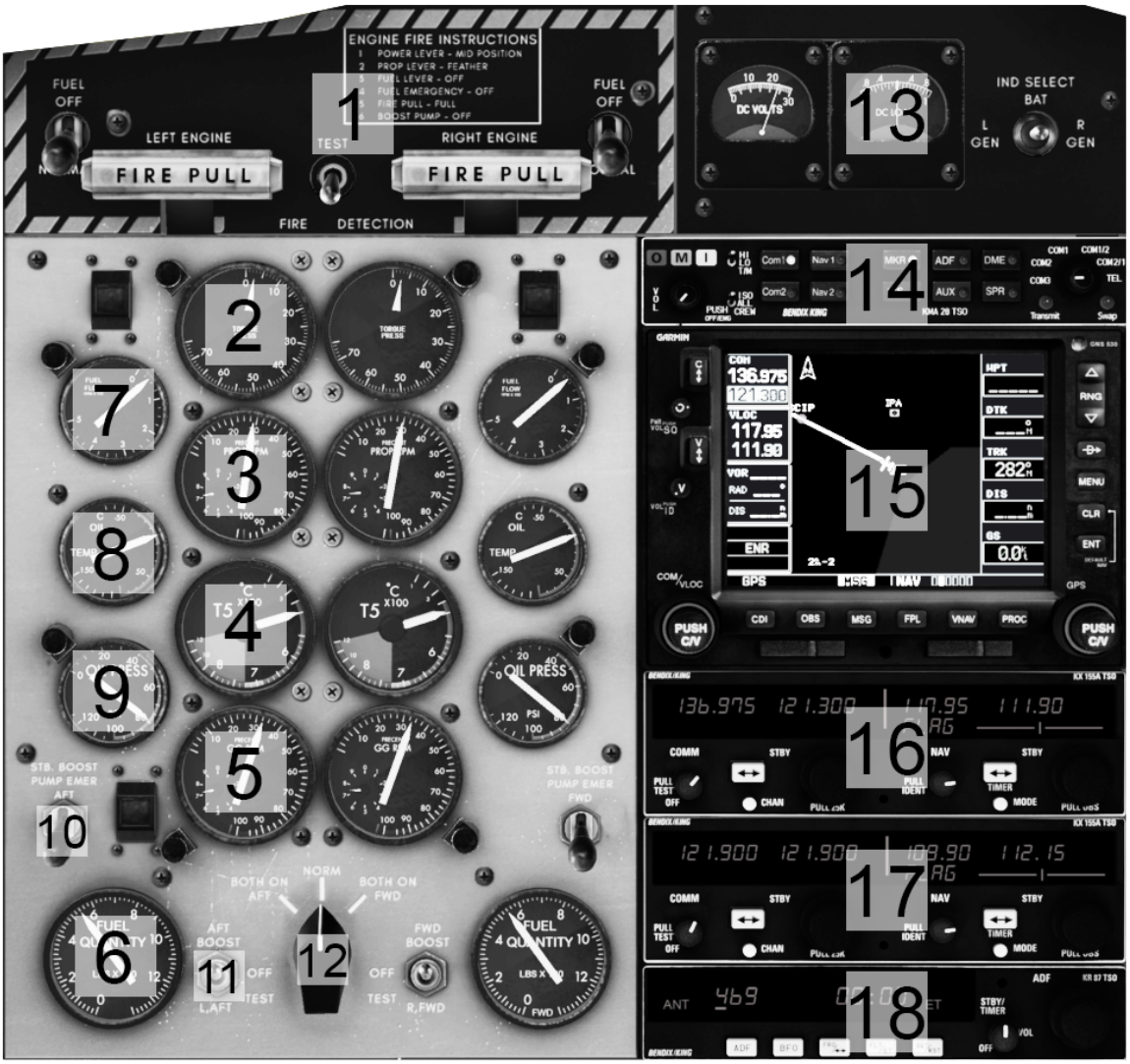
13. Autopilot Annunciators

14. Altitude Alerter

15. Stall Warning

16. Outer, Middle, Inner Marker Annunicators

Center Panel Overview



1. Fire Protection Panel
2. Torque Pressure Gauge
3. Prop RPM Percentage Gauge
4. T5 Temperature Gauge
5. Gas Generator RPM Gauge

6. Fuel Quantity Gauge

    - Left gauge: AFT, Right gauge: FWD

7. Fuel Flow Gauge

8. Oil Temperature Gauge

9. Oil Pressure Gauge

10. Standby Booster Pump AFT/FWD

11. Booster Pump AFT/FWD

12. Engine Fuel Selector

13. DC Volts/Load Indicator

14. Audio Panel - KMA 28 TSO

15. GPS - Garmin 530

16. NAV/COMM 1 - KX155A TSO

17. NAV/COMM 2 - KX155A TSO

18. Transponder - KT70 TSO

Electrical System

A battery located in the aft baggage compartment and two generators power the electrical system. Two inverters provide alternating current.

DC Master Switch

Overhead Panel - 2 way switch

OFF: no power to left and right bus

DC MASTER: power from the generators, external or battery to non- main buses

Battery Switch

Overhead Panel - 3 way switch

EXT: connects external power to buses

OFF: disconnects power from buses

BATTERY: battery powers electrical system

Bus Tie Switch

Overhead Panel - 2 way switch

OPEN: left bus and battery or powered by left generator while right bus is powered by right bus.

NORMAL: generators are power both busses in event of failure.

Generator Switch

Overhead Panel - 3 way switch

OFF: Turns off generator

ON: Turns on generator to draw power from respective engines RESET: Resets the generator. Select when generator gets tripped from high or low voltage

Hydraulic System

Hydraulic pressure is provided to the system by an electrical pump that runs from electrical bus (left). All control surfaces, and landing gear functions are operated from a hydraulically. It is an automated system.

Two gauges show hydraulic pressure on the panel. They will show the same reading under all normal operating conditions.

Pneumatic System

The pneumatic system provides hot air to: - Cabin Heating

- Autopilot

- Anti-Ice

The system is completely automatic.

Bleed Air Switch

Overhead - 2 way switch

OFF: turns off the bleed air shut off valve

BLEED AIR: turns on the bleed air shut off valve

Anti-Ice System

The Twin Otter has following de-icing:

- Prop Deice
- Engine Intake Anti-Ice
- Wing
- Pitot Heat
- Windshield Heat (Disabled)

When an estimated 1 cm of ice has built up on the wings, operate the Deicer Boots:

The mode switch dictates how the stab de-ice will work. In AUTO the system will cycle through each inner wing, outer wing for both left and right stabilizer. In MANUAL, each deicer boot must be selected individually by using the right combination of the DE-ICE buttons, the left — right stab switch and the inner and outter stab switches.

The rate switch will dictate the automatic wing deicers speed. It can be switched between SLOW and FAST.

Autopilot

The twin otter has a simple autopilot offered. The ADI has been retrofitted, and as such has no flight director guidance system.

It has a 2 way switch that allow pilots to turn on/off the autopilot. A green lit triangle will show whether the autopilot is on. (If the GO AROUND button is selected, the green light will show ENG even though the switch may be in the DIS position.)

Two lights that read "TRIM UP" and "TRIM DN" also illuminate on the autopilot selecting unit respectively when the aircraft is being trimmed.

These 4 lateral modes can be set on the autopilot panel:

- HDG
- NAV
- APPR
- B/C

-In HDG mode, the aircraft will follow the heading input into the HSI.
-NAV mode will fly the radial of a VOR or the localizer from an ILS.
-APPR mode will arm both the localizer and glideslope (annunciators above ADI)
-B/C will follow the backcourse of the localizer

These 2 vertical modes can be set on the autopilot panel:

- ALT
- IAS

-In ALT mode, the aircraft will capture and fly the current altitude
-IAS mode uses pitch to hold the airspeed indicated when the IAS was activated.

Increasing power will result in a climb while decreasing the power will cause a decent.

The autopilot is connected to an Altitude Alerter (above the ADI) that has 3 main buttons.

-MDA: The altitude is set to the MDA (Minimum Descend Altitude) and then the MDA button is pressed. This will intercept the altitude if you descend through it.

-GO AROUND: This will engage autopilot (if not prior) and climb at 8 degrees and maintain heading.

- ALT ALERT: The altitude is set to cruise and then ALT ALERT is pressed. A light will illuminate on the altitude selected when the aircraft is 1000 ft from the dialed altitude and turn off when the aircraft is 200 ft from the dialed altitude. It will then capture the altitude if the aircraft autopilot is active.

Fuel System

The twin otter fuel tanks located under the floor. Named FWD and AFT, these fuel tanks rely on booster pumps to push the fuel from underneath the floor, up into the high mounted engines. Under normal operating conditions, the aft tank feeds the left engine while the fwd tank feeds the right engines. Each engine has fuel heaters installed to prevent ice crystals. These are automatically controlled and are heated by the engine oil.

Booster Pump Switches

Main Panel

FWD/AFT BOOST: turns on the booster pumps.
OFF: turns off the booster pumps.

Fuel Tank Selectors

Main Panel

NORM: under this setting, the aft tank feeds the left engine while the fwd tank feeds the right.
BOTH ON AFT: the aft tank fuels both engines
BOTH ON FWD: the fwd tank fuels both engines

Fuel Quantity

Two fuel gauges show the fuel left in both the aft and fwd tanks.

Emergency Shutoff

Two switches located on the emergency panel, are used to shut off fuel pumps in the event of a fire. (Note: For engine fire to be extinguished, fire handles must also be pulled.)

Fire Protection

Both engines have extinguishers equipped.

Pulling the left or right handle will shut down the engine and release a fire suppressant.

External Lights

Position Lights

Overhead

Turns on POSN (Nav) lights located on the wing tips and tail of the aircraft.

Anti-Collision Lights

Overhead

Turns on Anti-Collision (beacon) light on the top of the the vertical stabiliser.

Strobe Lights

Overhead

Turns on Strobe lights located on the wing tips.

Taxi Light

Overhead

Turns on Taxi light attached to the front gear.

Landing Lights

Overhead

Turns on landing lights.

Internal Lights

PLT ENG INST & EMER PANEL LTS

Overhead

Turns on pilot and engine gauges

CONSOLE FLAP & TRIM PNL LTS

Overhead

Turns on all backlighting in cockpit

CO PLT RADIO & V/A PNL LTS

Overhead

Turns on co pilot gauge lighting and radios

GENERAL

Overhead

Turns on lighting for the cabin.

Caution Lights

L/R GENERATOR

Illuminates if generator is off.

L/R GENERATOR OVERHEAT

Illuminates if generators overheat

L/R ENGINE OIL PRESSURE

Signals oil pressure under 40 PSI

DOORS UNLOCKED

Illuminates if an door is open.

BOOST PUMP 1 AFT PRESS

Illuminates if fuel pump is off and fuel boost pressure is below 2 PSI

BOOST PUMP 2 AFT PRESS

Illuminates if fuel pump is off and fuel boost pressure is below 2 PSI

BOOST PUMP 1 FWD PRESS

Illuminates if fuel pump is off and fuel boost pressure is below 2 PSI

BOOST PUMP 2 FWD PRESS

Illuminates if fuel pump is off and fuel boost pressure is below 2 PSI

PNEUMATICS LOW PRESS

Illuminates if any bleed air circuit is under 14 psi

RESET PROPS

Illuminates if feather levers are not fully feathered when power is below 70%

DUCT OVERHEAT

Not simulated

400 CYCLE

Illuminates if the inverters have failed.

FWD FUEL LEVEL

Illuminates if there is less than 75 pounds of fuel in forward tank

AFT FUEL LEVEL

Illuminates if there is less than 110 pounds of fuel in the aft tank

Inside X-Plane

We have made flying the V2 version of the Twin Otter even easier to fly. Four pop-up menus are available to extend the flying experience; a menu, a radio pop-up, a checklist and a weight and balance manager. These are are all discussed in greater depth below.

The Twin Otter makes use of several types of possible interaction. Click and drag, toggle, and scroll wheel. Throttles, and other infinitely adjustable levers make use of click and drag manipulators. Two way switches and levers make use of toggle manipulators. All knobs and 3 way switches can be clicked and dragged but also support scroll wheel inputs.

Auto-Updating

The Twin Otter V2 has makes use of a new way of updating. It will automatically update through the simulator whenever a new update has been posted. A message will tell you to reload the aircraft which you can via Developer>Reload the Current Aircraft.

Reality XP Integration

The Twin Otter V2 also supports the Reality XP Garmin 530. When installed, enable the option Plugins>Reality XP GNS>GNS 1>GNS 530 1. It has been set up to accept all basic commands for X-Plane. No other action is needed once this has been accomplished.

The Twin Otter also supports the Reality XP GTN 750. To enable support make sure the GTN 1 is on via the Reality XP menu and you have GTN 750 Support ON via the Twin Otter menu.

Repainting

The Twin Otter V2 has both the long-nose and short-nose variants modelled. The aircraft will adjust automatically based on the [LN] or [SN] tag at the beginning of all liveries names. Repainters need to add this tag to the beginning of all repaints or the aircraft will not display the correct variant.

Menu

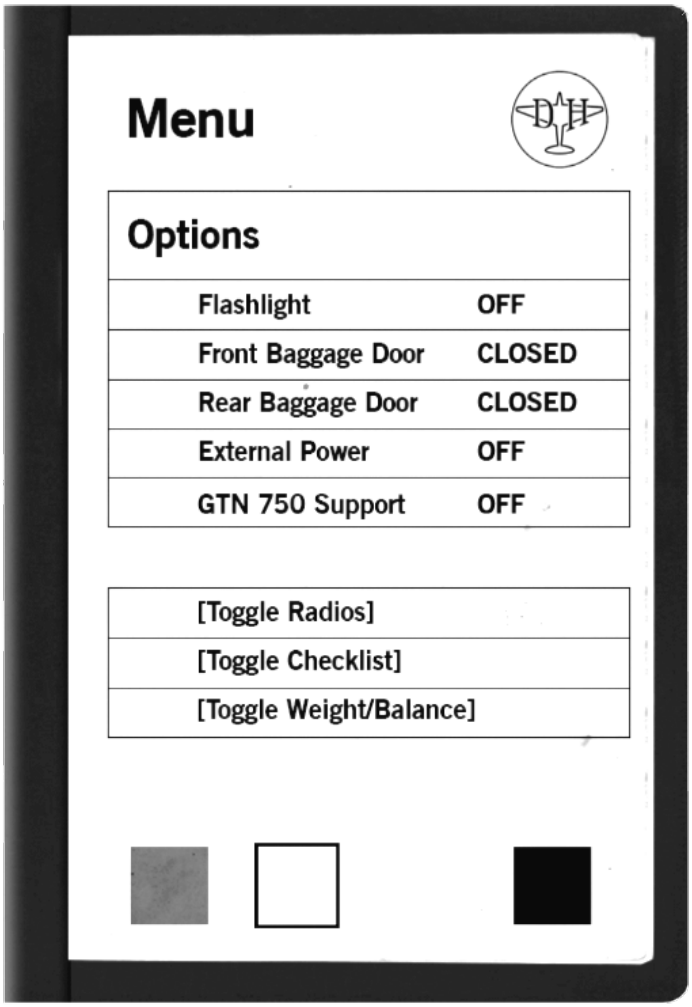
The Twin Otter has been equipped with a pop-up menu. The menu can be opened by clicking the black book found in the pilot side door pocket.

It allows the user to turn on the flashlight, open the baggage doors, and connect the external power. It can also be used to open the radio panel pop-up, the checklist or the weight and balance manager.

The menu also allows the interior trim colour to be selected. Users can select between green, blue, grey or black. The default colour in the Twin Otter V2 is blue.

When the float version has been loaded it, it will also give the option to remove the gear from the floats. It is not recommended that this process be done while on land.

The menu can be closed by clicking the black book found in the pilot side door pocket or by clicking on the X in the top right corner.



Radios

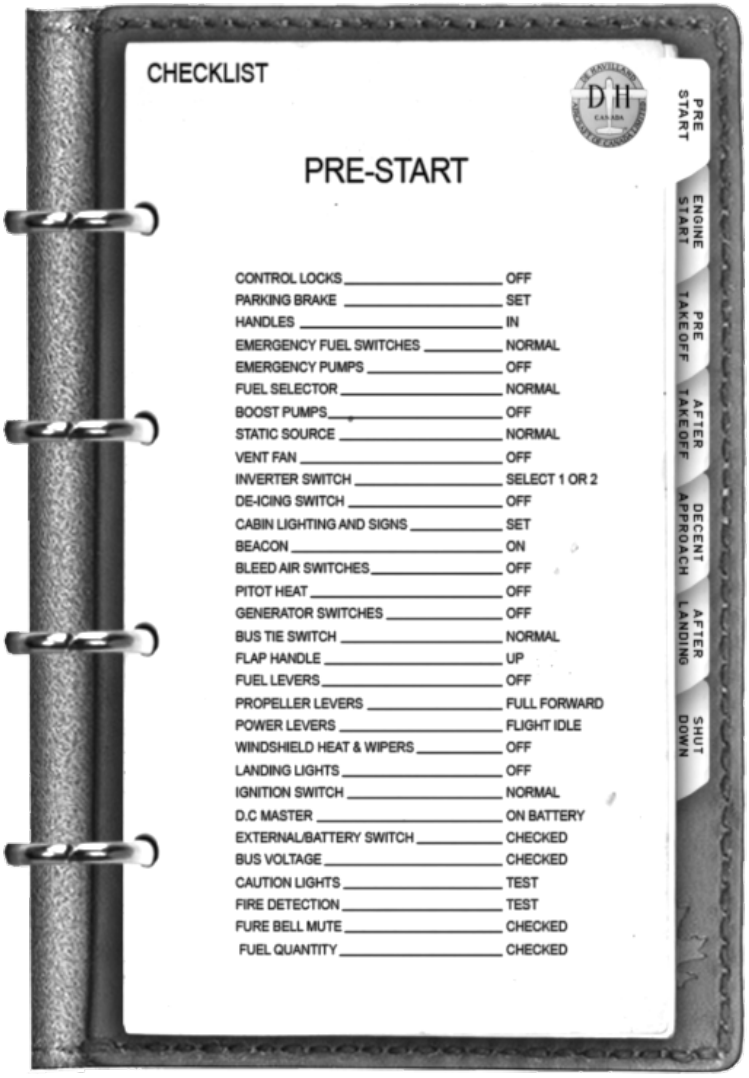
The Twin Otter is equipped with a KMA 28 audio panel, two KX155A NAV/COMM units, a KT70 transponder, KR 87 ADF unit. All functions available using manipulators are also able to be input using the Radio pop up. This pop-up can be toggled by clicking the LCD faces on the radios or by clicking the [Toggle Radios] button on the Twin Otters main menu.

Checklist

The Twin Otter is equipped with a pop-up checklist. It can be activated by clicking the [Toggle Checklist] button on the Twin Otters menu. Tabs down the right side show can be clicked to show the following checklists:

- Pre start
- Engine start
- Pre takeoff
- After takeoff
- Decent/Approach
- After landing
- Shutdown

The checklist can be closed by clicking on the [Toggle Checklist] button on the main menu or by clicking the X in the top right corner.



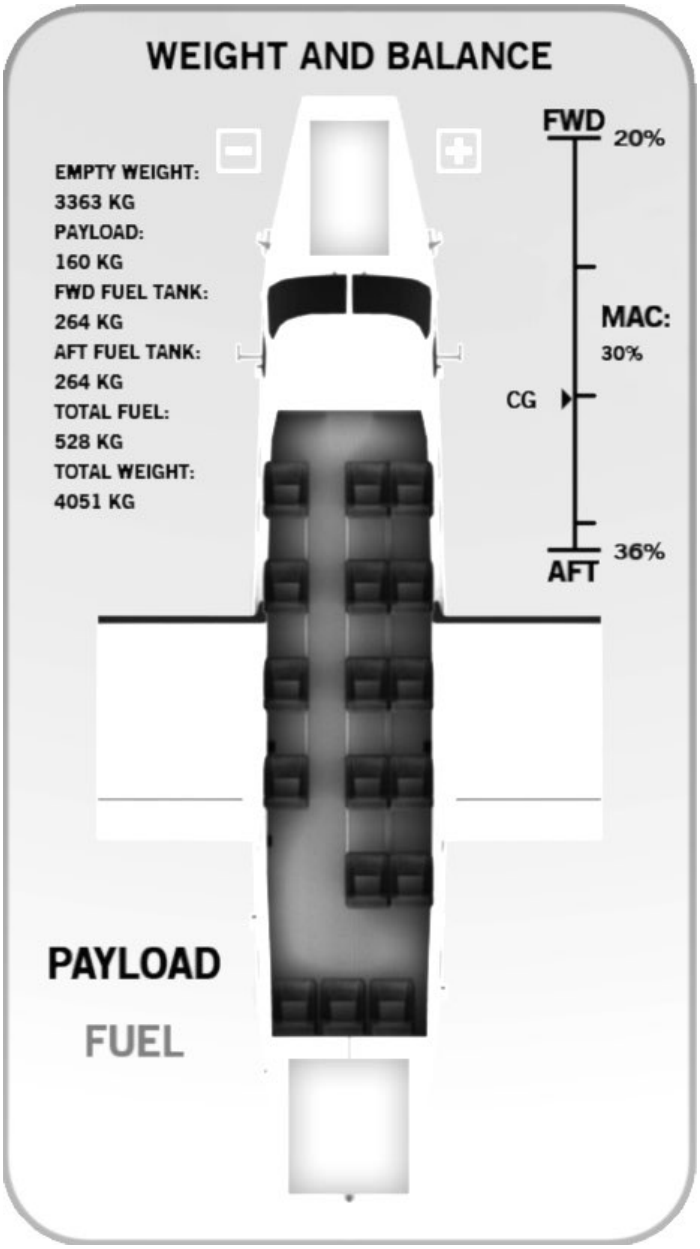
Weight and Balance

The Twin Otter is also equipped with a real time weight and balance manager. The pop-up can be activated by clicking the [Toggle Weight/Balance] button on the Twin Otter menu. It allows specific seat and luggage placement within the aircraft while showing the weight and balance as a percentage of the Mean Aerodynamic Chord. The twin otter has a recommended MAC of between 20% and 36%.

It will also allow custom filling of the FWD and AFT fuel tank underneath the floor of the Twin Otter.

All weights are taken into consideration to show exactly where how heavy the aircraft is and what its current MAC is. If the aircraft is above its MTOW, a message will show in the bottom right corner alerting the pilot.

The checklist can be closed by clicking the [Toggle Weight/Balance] button on the main menu or by clicking the X in the top right corner.



Support

Thank you for buying the Twin Otter V2. We hope you enjoy the aircraft! For all queries and support questions, please email:

robwilsonjetsim@gmail.com