City Link
Virtual Airlines

# DHC6-400

## Pilot Operating Handbook


For use with

**Microsoft Flight Simulator**

This manual is for use with FS only. The user should have a basic understanding of FS. The data contained in this manual was collected from several different sources and has been modified to go with the performance characteristics of FS.

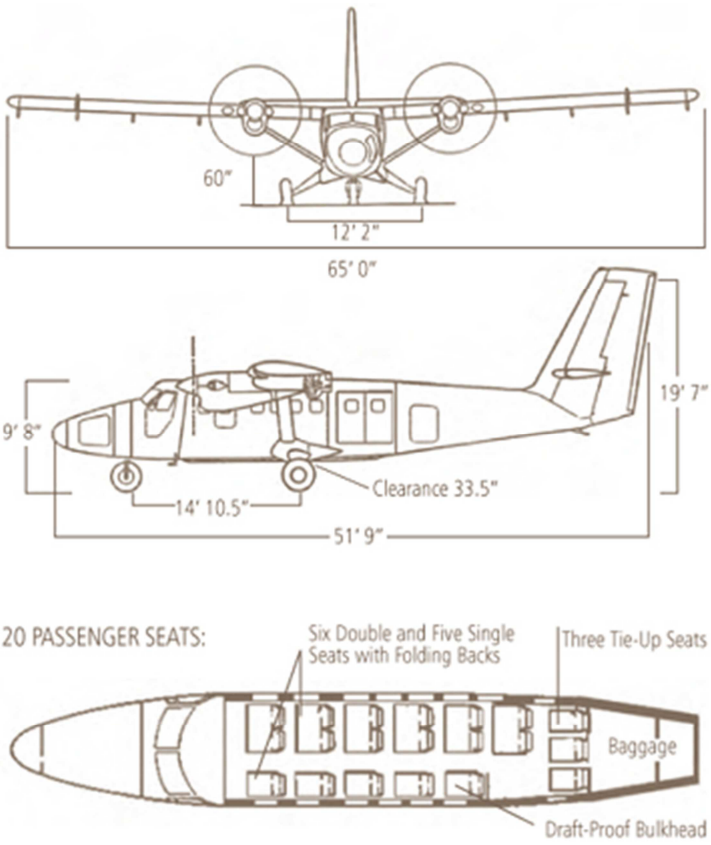
www.citylink-va.com

The Dash 6 twinotter started in 1965.
After version 100, 200 and 300, who where practically equal the 400 series was build by the Viking company.
The Viking company had been building parts for the Twinotters in licence from the Dehaviland company.

The DHC6-400 transports more kilograms and add one more passenger.


**Thanks to:**

Premaircraft Design for the model
Rob Bindels for the repaints.




**Critical Speeds**

**Taxi:**

- Max. 25 knots on straight taxiways.
- Max. 10 knots in turns.
- Max. 10 knots approaching parking areas.

**Maximum Operating Speed** . . . . . .Vmo-170 kias
**Avg. Rotation Speed** . . . . . … Vr -85 kts
**Avg.Take-off Safety Speed** . . . . . … V2-95 kts
**Clean Stall Speed** . . . . . ….Vs-66 kts
**Dirty Stall Speed** . . . . . …Vs-58 kts
**Approach Speed** . . . . . …105 kts
**Touch Down Speed** . . . . . …… 90 kts

Flap Position Limiting Speed
11. . . . . 130 kts
11$_0$. . . . . 110 kts
44$_0$. . . . . …. 95 kts
45$_0$. . . . . …. 80s kts

**Notes:**
Full flap is selected approaching DH if runway is visible or on late finals.
On approach a negative pitch of 4-5 degrees is normal

**Miscellaneous Data:**
Ceiling . . . . . .. .26.700 ft
Take-off Field Length . . . . . 1.200 ft
Landing Field Length . . . . . .. 1.050 ft
Range . . . . . .... . . . 775 nm

**Fuel Loading Data**
Maximum Range: 775 Nautical Miles
Fuel Burn Rate Factor: **0.5419**
Base Fuel Load: 54 gallons (approx. 100nm reserve)
Fuel Loading Formula: ((Fuel Base Amount)+(Trip Distance x Fuel Burn Factor))
**This will provide you with the total amount of fuel needed**
Fuel Distribution Formula: Divide the amount of fuel by two and load this amount into the main left and right fuel tanks. Any remaining fuel should be loaded in the center fuel tank.
**This will provide even distribution relative to the fuel tank's capacity**

**Example: 300 NM Trip Distance**
**((54 gallons)+(300NM x 0.5419)) = 217 gallons**

**Main Fuel Tank Distribution: 217 gallons x 0.50 = 109 gallons each.**
To load fuel, choose Aircraft, Aircraft Settings, Fuel to bring up the fuel-loading window. Using the example above, you would enter the amount of 190 gallons in the box for each main fuel tank. Be sure to load these figures in the gallons box, not the percent or pounds box.

**Taxi**

**Visibility:** There is an area near the aircraft where people, obstacles, or ground equipment cannot be seen. It is very important that slow taxi speeds are used while in the terminal area to ensure safe operation.


(You can use the build in Pushback and Taxi tool. In the image is the best setting for Pushback at EHBK)

**Taxi Thrust:** To break away from the ramp, release the brakes and smoothly increase the thrust. When increasing power to start moving, set the power and wait for the aircraft to respond. Do not continually add power until the aircraft moves because this will result in more power that is desired or necessary.

**Taxiing:** When entering a turn, overshoot the centerline to compensate for the aft position of the main landing gear. If the nosewheel is turned too rapidly or at too high a ground speed, the nosewheel will lose traction and skid. When making a tight turn, it is recommended that a speed of 0 to 10 knots is used. It is a recommended technique to anticipate stopping/turning points and return the throttles to idle allowing the aircraft's weight to provide natural braking. This reduces the ware on the braking system and provides a more comfortable environment for passengers.

**Take-off**

**Before Take-off Checklist:** The "Before Take-off Checklist" should be nearly completed prior to reaching the take-off position. The checklist must be completed prior to take-off.

**Runway Alignment:** Line up slightly to the left or right of the centerline to avoid the runway centerline lights, which can cause excessive wear to the nosewheel's tires. Once lined up, check the heading indication to assure that it is about the same as the runway number.

**Rotation and Initial Climb**
Take-off and initial climb performance is dependant on the aircraft's weight and the weather conditions. Rotation speed (VR) and initial climb speed (V2+10 knots) should be calculated prior to take-off. It is very important that proper technique is used during the rotation and initial climb. Over-rotation will result in the aft of the fuselage contacting the runway. Under-rotation results in an increased ground run. If the rotation is handled improperly the initial climb performance will be decreased. Initiate a smooth rotation at VR to the initial climb attitude while keeping the wings level. Adjust your initial climb attitude to maintain V2+10. When performed correctly, the aircraft should lift-off at 5-8° of deck angle.

The initial climb (15° take-off flap setting) is divided into three segments:
1. Use take-off power to 1,500 feet above field level and maintain V2+10. Do not exceed 20° of deck angle.
2. After crossing 1,000 AFL. set climb power. While accelerating to 160 kts. retract flaps and maintain 160-180 kts. to 3,000 AFL.

**Crosswind Take-offs**
While taking off in crosswind conditions, use the rudder pedals to keep the aircraft aligned with the centerline of the runway. As the speed increases you may encounter wing roll. At the first indication of wing roll, use sufficient aileron into the wind to keep the wings level. Smooth control inputs will result in a normal take-off without over controlling.
The aircraft may be in a forward-slip if you have crossed controls at lift off. Recovery can be accomplished after lift-off by releasing both the rudder and aileron inputs and establish a wings level attitude.

**Climb**
Smooth turns and changes in altitude will provide a comfortable ride for the passengers. Try to use the auto-flight system to control heading, altitude, and speed changes.

**Cruise**

**Climbing to a Higher Altitude:** The autothrottle should be set to maintain the desired airspeed. Make all changes in altitude in a smooth manner. It is recommended to use a rate of climb less than 1000 feet per minute when transitioning from one cruise altitude to another.

**Cruise Speed**
The desired cruise speed is dependant on the aircraft's weight, cruise altitude, and prevailing weather conditions. Typical cruise speeds range from 230 kts to 260 kts. Use the autothrottle to maintain the desired cruise speed.

**Other Tasks**
Typical cruise tasks include monitoring the aircraft's systems, fuel consumption, and navigation. Changes in cruise altitude can be dependant on information discovered from these tasks, so it is important that the crew be alert and aware of how their aircraft is performing.

**Descent**
**Standard Descent Procedure:** Clean configuration with idle power is the preferred method. When approaching the selected level-off altitude, reduce the rate of descent to 500 feet per minute and manually advance the throttles forward to ensure a smooth transition.

**Holding**
Higher altitudes are preferred for more efficient fuel consumption. Hold cruising speed until three minutes from the holding fix, then start reducing your airspeed to assure that the proper speed is attained prior to entering the holding pattern.

**Beginning of Descent Point**
When creating a flight plan, the BOD (Beginning Of Descent) point should be considered the optimum point to begin an unrestricted descent to a landing. The following equation should be used as a guide for calculating the BOD point.

**BOD Point Equation**

- Calculate the altitude difference.
- Drop the last three digits.
- Multiply by three.
- For descent to a landing add 10 nautical miles. For a descent to an intermediate altitude above 10,000 feet, no additive required.
- Adjust for wind by subtracting 2nm for each 10 knots of headwind, or adding 2nm for each 10 knots of tailwind.

**Example:** Descending from FL100 to 3000 feet for landing with a 20 knot headwind:

- 10,000 - 3,000 = 7,000
- 7,000 = 7
- 7 x 3 = 21
- 21 + 10 = 31 nautical miles
- 21 - 4 = 17 nautical miles.

**Answer:** The BOD point should be 17 nautical miles from the destination point.

**NOTE:** Adjust your rate of descent to assure target altitude interception within the determined distance.

**Approach and Landing**
**ILS Approach:** ILS transmitters are vulnerable to electronic interference that can corrupt the signal it transmits. Thus, constantly check the alignment using the HSI and ADI.

**Glide Slope or VASI:** The VASI or ILS glide slope should always be used when available on VFR approaches. This assures proper approach path, which aids in the compliance with noise restrictions.
**Use of Thrust Control:** During the approach phase the throttles should be regarded as a primary flight control. Their use should be coordinated with the elevators to control airspeed, rate of descent, and assure proper alignment on the glide path.

**Autothrottle Control:** Be prepared to override or disconnect the autothrottle if the need arises due to unsafe conditions or manual control is preferred.

**Normal Glide Path:** The normal glide path is based on the instrument approach. Once on final approach, only small adjustments to the glide path should be made. This will result in the same approach weather VFR or IFR. It is a good practice to aim all approaches at the 1,000 foot point on the runway. This will assure proper threshold clearance by the main landing gear.

**Final Approach:** The three-degree glide path results in approximately 300 feet of altitude for every mile from the end of the runway. The rate of descent for a threedegree glide path can be determined by one-half the ground speed (in knots) times ten. Thus, for example, an approach speed of 130 knots would look like:
130 ¸ 2 = 65, then 65 x 10 = 650 feet per minute

**Management of The Approach:** Adjustments should be made early in the approach. For safety, the rate of descent should be limited to less than 2,000 feet per minute when below 2,000 feet AGL and less than 1,000 feet per minute when below 1,000 feet AGL.
For a Category I ILS approach, the transition from the ILS glide slope to a visual glide slope should be made between the decision height and 100 feet AGL. The radio altimeter is a valuable aid in determining the aircraft's height above the ground. This will also assist when determining the approach, flare, and touchdown.

**Touchdown:** Reduce the rate of descent approximately 30-40 feet AGL by applying light backpressure to the yoke to increase the attitude by 2 to 3 degrees. The goal is to reduce the rate of descent, not stop the rate of descent. As this attitude is being applied the power should be slowly reduced to idle.
The aircraft tends to float above the runway due to the ground effect. Proper management of elevator input and thrust control can counter the ground effect. After touchdown, lower the nose prior to engaging the reverse thrust.

**Summary:** Use of proper procedures will result in consistently safe landings. Use the ILS when it is available, regardless of the weather conditions to assure safe approaches. If neither an ILS glide slope or a three-bar VASI are available, use the "300 foot per mile" equation to determine the proper rate of descent.

**Landing in Adverse Conditions**
This portion of the Flight Techniques section will cover techniques that apply towards typical crosswind landings and control problems encountered due to poor runway conditions.

**Crosswind Landings:** Most important key is to keep the wings level during the final approach. Maintain runway alignment by crabbing until the last 100 feet, then use the sideslip maneuver for touchdown. If the aircraft drifts off the centerline of the runway during the final phase of landing, attempts to correct the alignment by using the ailerons increases the possibility of the outboard engine or even the wingtip contacting the ground. The pilot in command should judge based on the rate and amount of displacement whether or not to go around.
Wet or icy runway conditions with a crosswind is not a good combination. The pilot in command should maintain alignment towards the upwind side of the centerline of the runway. After touchdown, the aircraft will weathercock into the wind. Due to the poor runway conditions, steering using the aircraft's nose gear may be less effective. To aid in directional control differential braking may be used.

**Turbulent Air**
Known severe turbulent air conditions should be avoided when possible. If flight through severe turbulence is unavoidable, observe the recommended turbulence penetration airspeed. For this flight model the recommended airspeed is 150 to 180 knots indicated air speed. When below 10,000 feet MSL, the minimum recommended airspeed is 150 knots indicated airspeed. These speeds allow for greater speed reduction while providing the necessary maneuvering speed margins.

**Autopilot:**
The autopilot may be used in moderate turbulence. The pilot in command should be ready to take control of the aircraft from the autopilot if the need arises. If severe turbulence is encountered consideration should be given to engaging the "LEVEL" (LVL) function on the autopilot, which will maintain wings-level flight. Once the severe turbulence has passed the autopilot may resume normal operation.

**Thrust Control:**
Avoid immediate power changes as the airspeed indicator will naturally bound as much as 20 knots during severe turbulence.

**Aircraft Attitude:**
Maintain wings-level and the desired pitch. Use the ADI (Attitude Director Indicator) as your primary instrument. Do not use large or abrupt control inputs to correct changes in the aircraft's attitude.

**Aircraft Altitude:**
Often during severe turbulence large variations in altitude are possible. Do not "chase" the altitude. Sacrifice altitude in order to maintain the aircraft's attitude. If necessary, descend to improve the aircraft's buffet margin.

**Icing precautions**

Whenever it is winter and you fly through a cloud, while freezing, you will notice it when flying.
The speed drops.
There are two things you have to do. Switch the Pitot heat, so the pitot tube will be heated, and use the de-ice switch in order to deice the engines and wings.
In order to use those switches, you need to remove the steeringwheel and then you can use it. Click on this little button, on the left side of the wheel. 


Then look on the rightside at the switches. The bottom row, first and second from the left are for de-icing and pitot heater.

# Viking DHC6-400 Normal procedures Checklist

**BEFORE STARTING ENGINES**
PARKING BRAKE . . . . . .SET
FUEL QUANTITY AND DISTRIBUTION . . . . . .SET
GEAR HANDLE AND LIGHTS . . . . .FIXED
FLAPS . . . . . .UP
ELEVATOR TRIM . . . . . .SET
FLT INSTRUMENTS/BUGS . . . . . .SET
DEPARTURE PROCEDURE . . . . . .REVIEWED
AUTOFLIGHT SYST.SET FOR DEPARTURE . . . . . .SET
TRANSPONDER . . . . . .SET

**ENGINE START**
PARKING BRAKE . . . . . .SET
ENGINE AREA . . . . . .CLEAR
ENGINE IGNITION . . . . . .ON

**TAXI**
PITOT HEAT . . . . . .ON
FLAPS . . . . . .SET
FLIGHT CONTROLS . . . . . .CHECKED
FLIGHT DIRECTOR . . . . . .ON
CLEAR OF OBSTRUCTIONS LEFT/RIGHT . . .CHECKED
PARKING BRAKE . . . . . .RELEASED

**BEFORE TAKE-OFF**
AUTO-FLIGHT SYSTEM . . . . . .ON
AUTO-THROTTLE . . . . . .ARMED
FLIGHT INSTRUMENTS . . . . . .CHECKED
FLAPS . . . . . .SET
LANDING LIGHTS . . . . . .ON

**AFTER TAKE-OFF**
LANDING GEAR . . . . . .UP AND NO LIGHTS
FLAPS . . . . . .UP
AT TRANSITION ALTITUDE
ALTIMETERS . . . . . .SET 29.92 In / 1013Hg
10.000 FT MSL
FUEL SYSTEM . . . . . .CHECKED
18.000 FT MSL
EXTERIOR LIGHTS . . . . . .AS REQUIRED

LANDING LIGHTS . . . . . .OFF

**CRUISE**
ENGINE PERFORMANCE . . . . . .CHECKED
NAVIGATION . . . . . .MONITOR

**DESCENT**
APPROACH PROCEDURE . . . . . .REVIEWED
LANDING DATA . . . . . .PREPARED
ANTI-ICE . . . . . .AS REQUIRED
LANDING LIGHTS . . . . . .ON
AT TRANSITION LEVEL
ALTIMETERS . . . . . .SET AND CHECKED

**BEFORE LANDING**
ALTIMETERS . . . . . .RESET AND CHECKED
FLT INSTRUMENTS/BUGS . . . . . .SET
FLAP SCHEDULE . . . . . .REVIEWED
FINAL APPROACH
LANDING GEAR . . . . . .DOWN AND GREEN
FLAPS . . . . . .AS REQUIRED

**AFTER LANDING**
AUTOFLIGHT AND AUTOTHROTTLE . . . . . .OFF
LANDING LIGHTS . . . . . .OFF
FLAPS . . . . . .RETRACTED

**PARKING**
PARKING BRAKES . . . . . .SET
COCKPIT LIGHTS . . . . . .AS REQUIRED
EXTERNAL POWER / APU . . . . . .ESTABLISHED
FUEL CONTROL . . . . . .CUT OFF
ENGINE IGNITION . . . . . .OFF
PITOT HEAT . . . . . .OFF
LOG BOOK . . . . . .COMPLETED