AIR FRANCE VIRTUAL AIRLINES

Airbus A380-800

Aircraft Operations Manual

First Edition

March 1, 2010

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Welcome

Welcome to the Air France Virtual Airlines Aircraft Operating Manual (AOM) for the Airbus A380.

This AOM is based upon the AFVA Fleet Installer airplane. We are always seeking to improve the accuracy of this AOM.

Should you have questions about the specifics of this airplane, this manual or aviation in general, you should create a helpdesk issue at our website http://www.afva.net that states your question and we will do our best to answer your questions.

History & Overview

Airbus' concept of an A380 actually grew out of a project initially titled "A3XX." In the summer of 1988, a group of Airbus designers, headed by Jean Roeder, began working on a concept for an "ultra high capacity airliner (UHCA)." The whole purpose of this project was to breaking Boeings market dominance it enjoyed since the birth of the Boeing 747. All manufactures knew that, to be profitable, the aircraft had to be 15% more efficient than any aircraft on the market and had to be in the 600-800 seat range.

In 1990, the Airbus "A3XX" concept was unveiled to the public at the Farnborough Air Show. The designers stated that the aircraft would be 15% more efficient than the Boeing 747-400 and would be the quietest aircraft on the market. In 1994, Airbus began playing with options for this new "A3XX" aircraft; they began mixing different pieces of the A340 and playing with new designs. Along with Airbus, Boeing was also playing with designs for a B747X to compete with an Airbus "A3XX" aircraft.

In 1997, Boeing suspended its B747X project among darkening markets and dropping interest. Airbus, however, continued to develop its "A3XX" concept and eventually settled on a double-decker layout. It actually wasn't until 19 December 2000 that Airbus agreed to spend the € 8.8 billion to build the "A3XX" project, which was quickly renamed the A380 after a brief vote.

The company settled on the A380 because the "8" was supposed to resemble the double-decker cross section; the number "8" is also considered lucky in some Asian countries. Manufacturing of the aircraft began on 23 January 2002 with the wing box component. Currently, there are 197 A380 on order with Air France expecting to receive 12 A380 with options for the A380F and A380-900.

Nearly four million passengers have already enjoyed the unique experience of flying on-board the A380 with unanimous enthusiastic feedback, taking them to 14 major international destinations worldwide in unequalled comfort. The A380 program has attained firm orders of 202 aircraft from 17 customers, while the in-service fleet has accumulated more than 10,200 commercial flights representing about 96,000 flight hours. Seating from 400 to more than 800 passengers, the A380 is the answer to alleviate traffic congestion at busy airports, while coping with growth and minimizing environmental impact.

Fleet highlights

Singapore Airlines took delivery of the first production A380 on 15th October 2007 and now has 10 aircraft in operation on routes from Singapore to Hong Kong, London, Sydney, Melbourne, Paris and Tokyo. Emirates took delivery of its first A380 on 28th July 2008 and now has 7 aircraft in service on routes from Dubai to Toronto, Bangkok, London, Seoul, Sydney and Auckland. Qantas received its first A380 on 19th September 2008 and now has 6 aircraft in operation on routes from Sydney to Singapore, London and Los Angeles, and from Melbourne to Los Angeles. Most recently, on October 30th 2009, Air France received its first A380. This marks the first delivery of the A380 to a European carrier, who will task the aircraft with operations on the Paris - New York - Paris route. Air France is equipping its A380s with 538 seats in a three-class configuration. Air France also is investigating the possibilities of adding Johannesburg, Beijing and Tokyo.

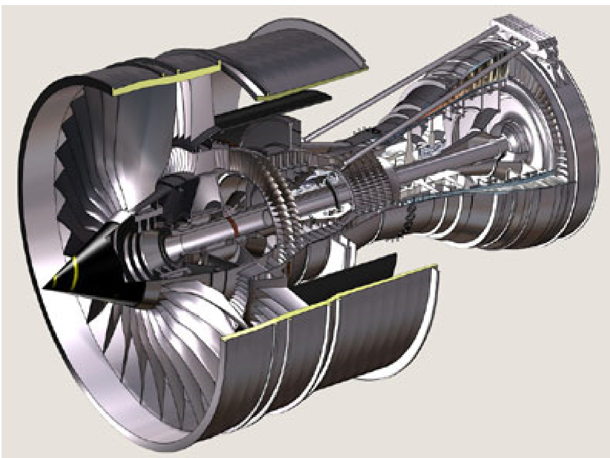
Operations

The aircraft is certified Cat IIIC (zero visibility, no minimums); however, it is restricted to Cat IIIB (zero visibility, minimums) due to obvious ground taxi constraints (you can't taxi an aircraft if you can't see the taxiway in front of you!).

Powerplants

The A380 is fitted with two variants of engines: the Rolls-Royce TRENT 900 and the Engine Alliance GP7200. Air France's A380 uses Engine Alliance GP7200 engines.

Rolls-Royce Trent 900

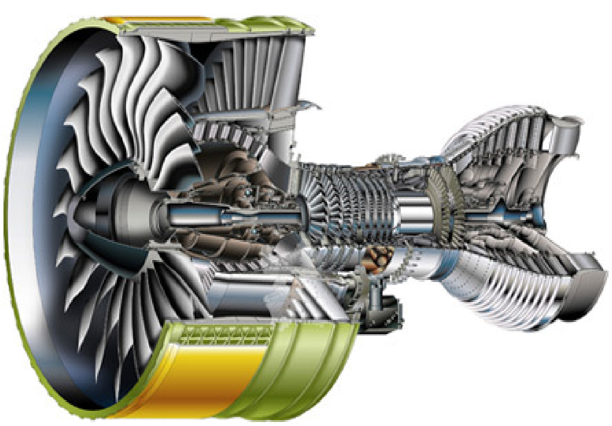


The Trent 900 was designed around the A380 with variants of the 900 having "4" notations (A380-84X).

Characteristics:

- Three shaft high bypass ration turbofan engine.
- Dry Weight of 13,830 lb.
- Cowling to Cowling diameter of 122 inches.
- Certified thrust is 70,000-76,500 pounds per foot with a capability of 80,000 pounds per foot.

Engine Alliance GP7200



The GP7200 was originally designed to fit the failed B747X project; instead it was reconfigured to fit the A380-800 variant. All A380 powered by GP7200 variants will get the "6" notion (A380-86X).

Characteristics

- Two-spool high-bypass turbofan engine.
- Dry weight is 14,798 lb.
- Cowling to Cowling diameter is 126 inches.
- 77,000 pounds per foot of thrust.

The Trent 900 engine currently powers 64% of the fleet with the GP7200-series powering the remainder.

Variants

The only available variants are the A380-84X and the A380-86X. Available in the future will be an A380-900 variant with seating up to 900 in an all economy configuration. The A380-900 could be available as early as 2015. Also coming between 2010 and 2012 is the A380F, the freighter version of the A380. The A380F is expected to be able to haul upwards of 150 tons of cargo, giving a MTOW of nearly 1,300,000 pounds. This MTOW is only exceeded by the massive Antonov An-225 "Mriya" (Ukrainian: Антонов Ан-225 Мрія).

Specifications

TYPE	A380-84X	A380-86X	A380-84XF	A380-86XF
DIMENSIONS				
Length	239 feet. 3 inches			
Height	79 feet 7 inches			
Wingspan	261 feet 8 inches			
Wing Area	9,100 feet^2			
Cabin Width (Main Deck)	21.6 feet			
Cabin Width (Upper Deck)	19.4 feet			
Wheel Base	99 feet 8 inches			
POWERPLANTS				
Engine Type	Trent	GP7270	Trent	GP7277
Maximum Rated Thrust (SLS, ISA)	70,000 Lbs	70,000 Lbs	76,500 Lbs	77,000 Lbs
WEIGHTS				
Empty Weight	610,000 Lbs		556,000 Lbs	
Maximum Gross Weight	1,239,000 Lbs		1,305,000 Lbs	
Maximum Takeoff Weight	1,200,000 Lbs		1,300,000 Lbs	
Maximum Landing Weight	851,000 Lbs		941,000 Lbs	
Maximum Zero-Fuel Weight	796,000 Lbs		886,000 Lbs	
CAPACITIES				
Maximum Fuel	81,890 US Gallons		81,890 US Gallons (94,000 US Gallons w/ option)	
Max Seating	525 (3-class), 644 (2-class), 853 (1-class)		n/a	
Cockpit Crew	2 – Although on longer flights, seating for 5 is available.			
Maximum Payload	200,000 Lbs		347,000 Lbs	
Maximum Cargo Volume	6,200 cu ft.		40,000 cu ft.	
OPERATIONAL LIMITS				
Service Ceiling	43,000 ft.			
Normal Cruise Speed	Mach 0.86			
Max Cruise Speed	Mach 0.89			
Maximum Range	8,200 nm		5,600 nm	
Takeoff Distance (Max Takeoff Weight)	9,000 ft		9,500 ft	
Landing Distance (Max Landing Weight – Flaps 20)	6,500 ft		7,000 ft	
Stall Speed – Flaps Up	145 Kts			
Stall Speed – Full Flaps and Max Landing Weight	118 Kts			
Maximum Indicated Airspeed	Mach 0.93			

Cockpit Checkout

Like other Airbuses, the A380 was designed to take the questions out of flying. The basic layout of the A380 flight deck is extremely similar to previously built Airbus' with a modification to two specific areas. Upon entering the flight deck, pilots are immediately drawn to a lack of a traditional Multi-Function Control Display Unit (MCDU), and to the two large LCD screens adjacent to the pilots joystick. Where a traditional MCDU would be placed, Airbus has included a complete navigation package, the Multi Function Displays (MFD). The MFD is: an MCDU, an ATC pilot communications device, and a aircraft systems advisor.

The two large LCD screens in front of the joysticks are the Onboard Information Display systems (OIT). These two screens are similar to the better known Electronic Flight Bag (EFB). These screens give access to performance data, company manuals, and flight charts. The OIT was Airbus' answer to a paperless cockpit.

Multi-function Display (MFD)

The MFD is a single unit with a dual display that combines the: MCDU, Radio stacks, weather radar controller (WXR), and ATC communication boxes. The MFD is controlled via the Keyboard Control and Cursor Unit (KCCU). The KCCU allows the pilots to open over 52 pages of information, as well as communicate with ATC their intentions. The KCCU is broken up into a compressed computer keyboard. The KCCU has: numeric keys, alphabetic keys, a cursor, a validation push-button, and MCDU keys. The MFD has four primary feature pages: MCDU, ATC COMM (short for ATC Communications page), SURV (short for Surveillance page), and FCU (short for Flight Control Unit) backup. The MCDU page contains all of the flight computer information needed for the flight.

The ATC COMM page allows pilots to communicate with ATC without having to speak directly to them. A pilot can bring up a set of predetermined commands, such as climb to a new flight level, enter it into the box, transfer it to the ATC mail-box, and then send the message to ATC. Not only does this feature help to cut down on misinterpretations, but it also allows a controller to better assess the position of the aircraft.

The SURV page has incorporated a couple different panels and put them into a single, less cluttered area. The SURV page has the transponder, TCAS (Traffic Collision Avoidance System), WXR radar, and TAWS. TAWS (Terrain Awareness and Warning System) is composed of four different systems: Terrain warning, the ground proximity warning system, glide slope (G/S) mode, and flap mode.

Finally, the FCU backup page is a repeat of the auto-pilot system. This page was installed to give the pilots the ability to continue on a routing even if the auto-pilot drops out midflight due to a wiring issue.

Onboard Information System (OIS or OIT)

The main objective of the OIS is to provide the flight crew with an attractive documentation, that enables an easy access to the necessary information for operational procedures. The OIS can be divided into: tools for flight operations support, tools for cabin operations support, tools for maintenance operations support, and services to the flight crews, passengers, and cabin crews. There are three domains of the Network Server System (NSS): The avionics domain, the flight operations domain, and the communications and cabin domain.

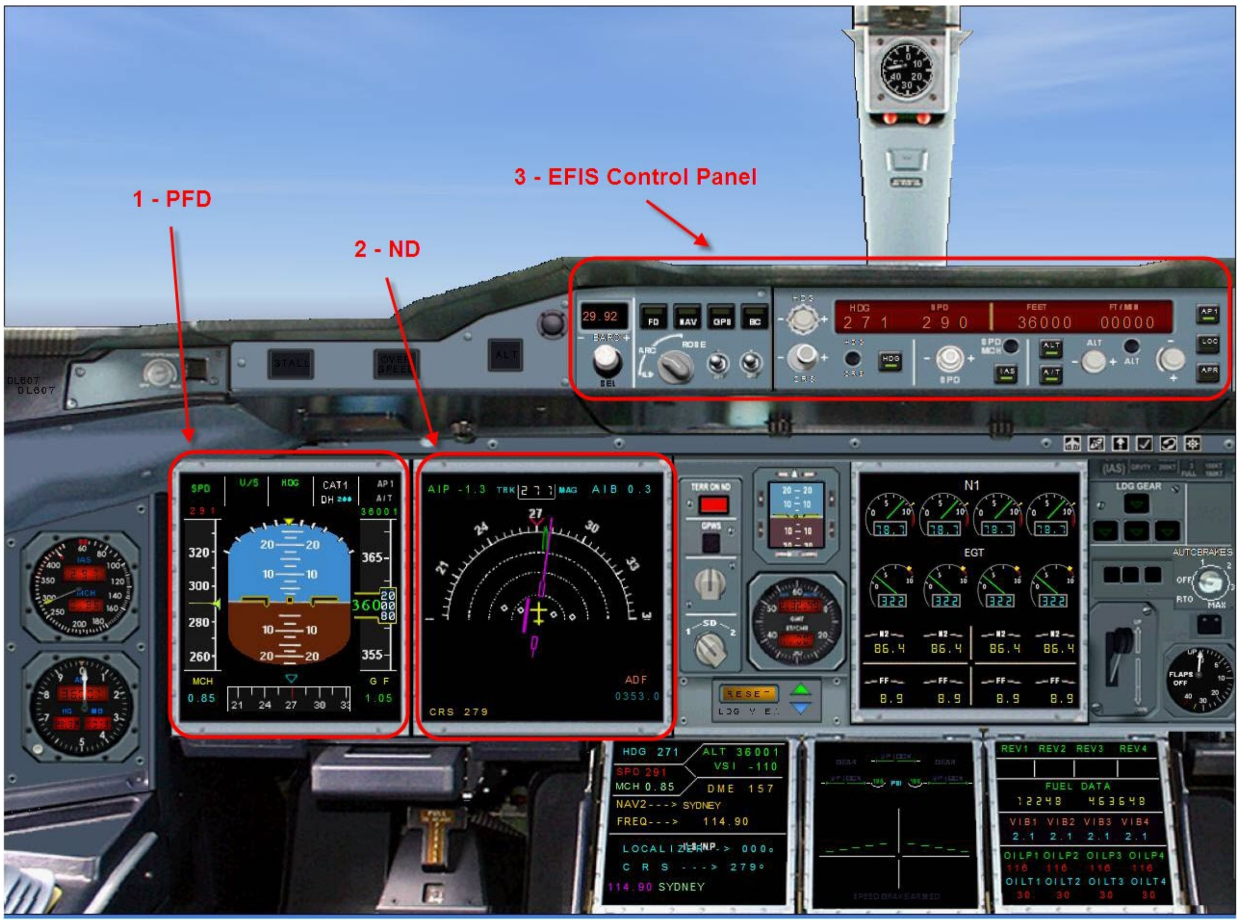
The avionics domain contains most of the maintenance terminals, as well as a list of electronic documentation that may need to be accessed by the flight crew. These electronic documents may be: MEL's, CDL's, CCOM's, etc.

The flight operations domain is Airbus' Electronic Flight Bag (EFB). The EFB contains information for the computation of takeoff, in-flight, and landing information. It will also contain: a weight and balance computation tool; a charts sector for navigation and weather charts; and electronic documentation - FCOM's, MEL's, etc.

The communications and cabin domain is not used by many airlines, but it can be used for: passenger comfort, passenger internet access - will transmit a wireless signal -, and can actually complete online banking. However, most airlines see these features as worthless and will not utilize the full potential of the system.

FS9 Cockpit Checkout

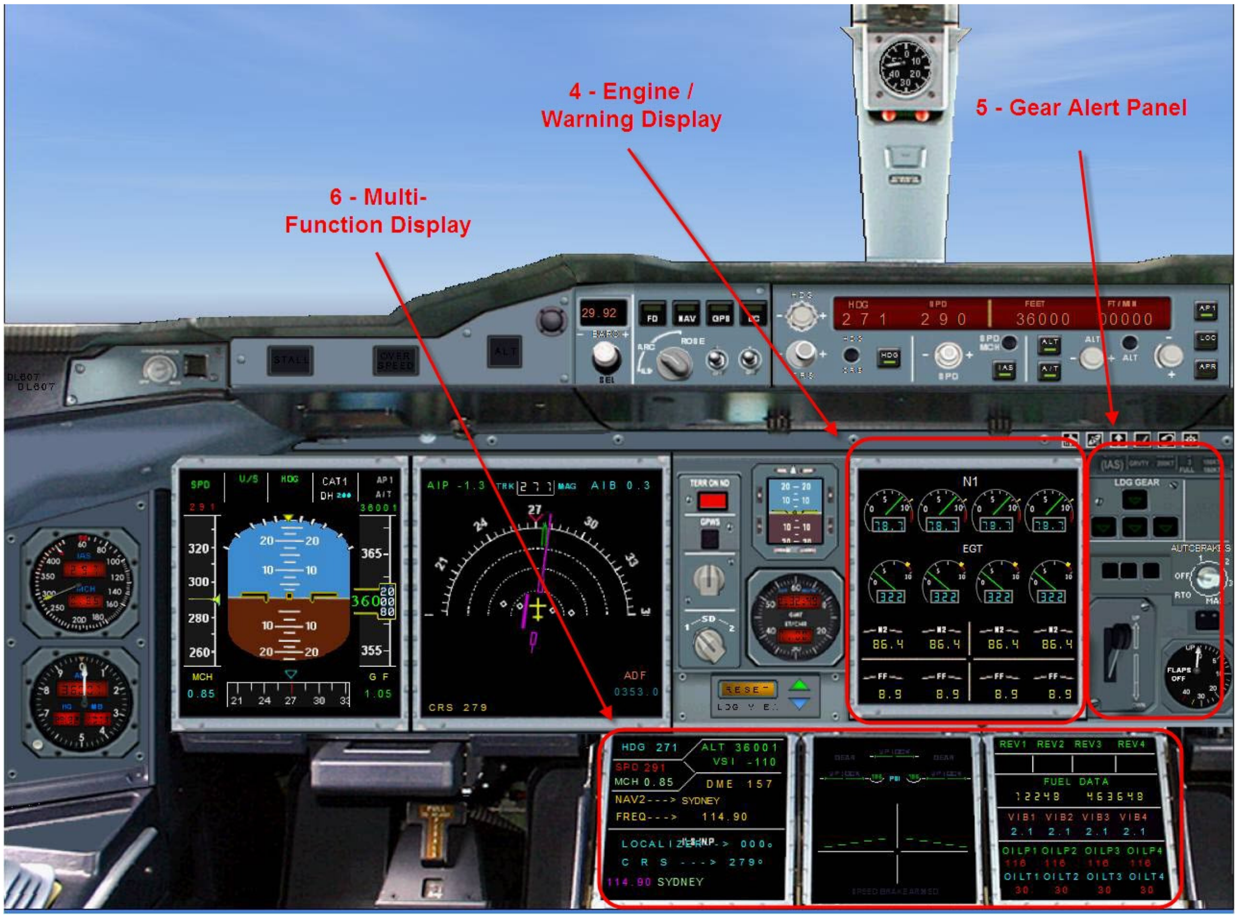
Captains Main Panel



1: PFD - The Primary Flight display gives you all of your basic information: airspeed, altitude, bank indicator, autopilot controls, barometer, and ILS indicators.

2: Navigation Display (ND) - The ND displays information related to the lateral navigation of the aircraft. There are five different modes for the ND: ARC, NAV, ILS, VOR, and PLAN. This display is controlled via the EFIS controller (#3).

3: EFIS control panel and autopilot - The EFIS control panel controls what is displayed on the Navigation display. Also available is the barometer setting. Continuing across from left to right is the Flight Control Unit (a.k.a the autopilot).



4: Engine/Warning display (E/WD) - This panel gives information on engine settings, flaps, and other aircraft systems.

5: Gear alert panel - Available in this section is information related to the state of the gear, flaps, and auto brake.

6: Multi-Function Display (MFD) - Due to the limitations of Flight Simulator, the MFD has been simplified. The MFD for this aircraft displays: radio information, gear, flaps, speed brakes, fuel load, EGT, and oil pressure.

FS9 Overhead panel

1: Engine ignition system - Each engine has a separate igniter and the igniters are controlled by the pilot here.

2: Fuel load - This panel displays information on the amount of fuel loaded in each tank area (wings, center, etc).

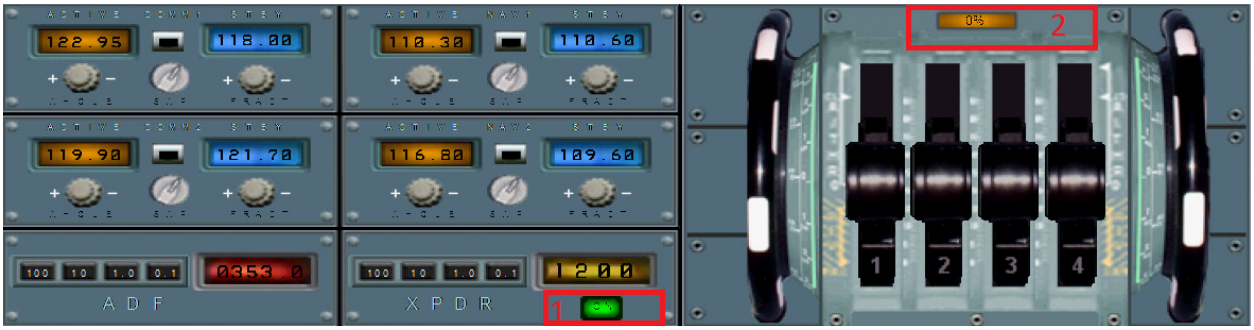
3: Battery - Each knob controls the batteries on the A380.

4: Anti ice - This panel controls the state of the aircraft anti ice. Default is for anti ice to the off, but can easily be switched on by selecting each switch to on.

5: Aircraft exterior lighting - Controls the exterior lighting on the A380 (beacon, landing lights, navigation lights, strobes, taxi lights, wing lights, runway turnoff lights).

6: Passenger signs - Controls the state of the passenger signs.

Radio and throttle panel



1: Radio panel turn on - Defaulted to off, the radios will not display until the red off switch is switched to a green on switch.

2: Engine thrust display - Displays the N1 settings of the throttles (also available on the E/WD).

Tutorial - How to fly the A380

In this short tutorial, we will introduce you to the methodology (or madness as some may say!) that Airbus has used in their A380. We will cover all of the basics, from what is displayed to a short demonstration flight. We will also cover and provide a couple useful checklists you may wish to use.

Transitioning to Airbus

If you are a pilot transitioning from the Boeing or McDonald Douglass fleet, learning the Airbus can be challenging. Aside from the multitude of computerized systems on the A380, there are two specific areas that need to be addressed. These areas are the flaps and the thrust levers.

The Airbus methodology behind its system of thrust levers was to give the onboard computers more control. As a result, they did away with the traditional thrust levers that gave pilots maximum control over what thrust setting was used. Along with this, Airbus also eliminated the TOGA switches which gave the computer control of the thrust levers and set the determined thrust. All Airbus aircraft (including the A380) use a system of several different "gates" that the throttles settle into for different thrust settings. These gates are CLB (climb), FLEX, and TOGA (Takeoff/Go Around). During takeoff, the thrust levers are either moved to TOGA or the FLEX gate. The TOGA gate produces the maximum takeoff thrust the engines are rated for. The FLEX gate is the de-rated takeoff setting. FLEX is most commonly used for takeoff. However, due to the limitations of freeware models of the A380, this feature is not currently modeled. The CLB gate is used once airborne and the computer instructs the pilot to retard the throttles to the CLB gate.

Also different is the Airbus use of flap measure. Unlike Boeing aircraft which list flap settings in degrees, Airbus simply labels their flaps as 0,1, 2, 3, and Full (sometimes listed as 4).

Airbus Instrument Instruction

As we begin our tutorial flight, let's begin by examining the instruments and panels you will be using the most.

Primary Flight Display (PFD)

The PFD on Airbus aircraft is extremely similar to Boeing aircraft with a few select changes. On the left side of the PFD is the speed tape. The red number above the speed tape is a digital read out of your current speed in (KIAS), and the blue number below the speed tape is the Mach. equivalent of your KIAS. On the right side of the PFD is the altitude tape. The green number above the altitude tape is your current altitude in a digital, more specific sequence. Sandwiched between the two is the artificial horizon. The artificial horizon gives your pitch and roll in degrees. Below the artificial horizon is the electronic horizon tape for quick reference to the current heading. At the very top of the PFD is the Flight Mode Annunciator (FMA). The FMA displays the current commands of the autopilot. Moving from right to left, we have: the current speed mode, the current level change mode, the current mode of navigation (can be HDG, NAV, or GPS, the current type of approach put into the MCDU, and which autopilot and if the auto throttle is engaged).

Navigation Display (ND)

The navigation display is situated directly to the right of the PFD. The Airbus ND can display a myriad of information. The ND can display: TCAS information, ILS deviation, as well as graphical and textural information related to flight management. The different modes of the ND can be displayed using the EFIS control panel which is pictured below.

The left knob controls the different modes of the ND. Once again, due to the limitations of freeware, only two of the four modes are selectable. The right knob controls the display of the MFD (center screen pictured below). Listed above are the different modes of navigation. The current mode of navigation is highlighted using a green strip over the selected button, and it is also displayed on the PFD. By selecting the NAV or GPS mode, the aircraft will follow the route programmed into Flight Simulator. The BC switch is only used for a back course ILS approach, which is hardly used and not currently used by any airports the A380 has service to. A quick note, the FD (Flight Director) button should always have a green bar above it. It is not a mode of navigation, but an aid in navigation.

Electronic Centralized Aircraft Monitoring (ECAM) system

Engine display

There are, in fact, two ECAM screens onboard an Airbus aircraft. The upper screen (which we will focus on) and the lower screen (the MFD on the A380). The upper screen has the N1 dial, the EGT (Engine Gas Temperature) dial, the N2 readouts for each pair of engines, and the fuel flow (FF) for each engine. Below these read outs is the current amount of fuel onboard in kilograms (also found on the MFD), and the current situation of the parking brake and the passenger signs. If the command (such as no smoking and seatbelts) are highlighted, that means they are currently in use; a grey command indicates it is not in use.

Glare Shield Panel

Moving up to the top of the panel, we come across the glare shield. We will review the different functions of the glare shield (some of them have been covered in above sections).

Master Warning and Caution

On the far left side of the FCU (not pictured above) is the master warning and caution. Master warning is on top and will flash red; master caution is on bottom and will flash amber. By depressing the button, the light will extinguish and the audible alert will silence. To the right of the warning and caution buttons are the CHRONO and Side Stick Priority buttons. By depressing the CHRONO button, a clock will appear on the ND and track your flight time. The Side Stick Priority button allows the pilots to give control of the aircraft to either the Captain, First Officer, or both. However, this feature is not modeled.

EFIS control panel

For operation, see the Navigation Display section. The only portion not covered was the barometer (not pictured). The barometer, immediately left of the EFIS control panel, allows the pilot to control the altimeter. It can be changed from inches of mercury (in Hg) for flying in America, to hectopascals (hPa) for European flying.

Flight Control Unit (FCU)

If you are a Boeing pilot, the FCU will be the biggest difference for you. Once again, because of the limitations of freeware, the FCU on this particular panel of the A380 does not operate the way a typical FCU would. So, we will discuss the operations of this FCU, and the operations of a typical FCU.

Just like any Boeing aircraft, the FCU has display window that reads out the current settings. Moving from left to right, these are: heading, speed, altitude, and the vertical speed. All commands input on the FCU will subsequently be displayed on the PFD. The heading can be changed by hovering over the knob and clicking with the left mouse button. You can also change the course for the ILS here. By clicking on the HDG/CRS button to the left of the HDG knob, one can switch the heading for a course and dial in the appropriate ILS course. To engage heading hold, simply click on the HDG button below the knob and confirm green bar.

Next is the speed controller. The speed controller operates the same as the heading controller. However, when above FL280, it is convenient to operate in Mach numbers rather than KIAS. To change to Mach mode, simply depress the SPD MCH button above the AP1 switch.

Continuing to the right we come upon the altitude setting. The altitude setting operates the same as the heading and speed knobs (+ is an increase, - is a decrease). The one area needing to be covered is the conversion to metric units. If flying the A380 through some Eastern European countries airspace, one will need to use meters rather than feet. To switch to metric mode, simply depress the METRIC/ALT button directly above the ALT button. Coupling with the altitude is the vertical speed knob. This also operates similar to the heading, speed, and altitude knobs, but you can level the aircraft by pushing the knob inward (usually a right click or a left click if a hand is displayed).

The last three buttons are used for the approach portion of the flight. The LOC button locks the tuned localizer; the APR button arms the glide slop (GS).

All of that being said, a real Airbus FCU operates as follows.

There are two modes of automatic flight in the Airbus series: Selected and Managed.

Selected: The pilot is telling the autopilot what you want it to do. For example, with the auto thrust system engaged, you may dial, or select, a particular speed you wish the aircraft to fly. The same holds true for heading, and to an extent, the altitude.

Managed: In this mode, the autopilot is receiving its commands directly from the Flight Management Guidance Computer (FMGC) based on the data active in the MCDU.

To better understand the push/pull action, you push the knob to give control to the FMGC, which commands the autopilot. You pull the knob to take control from the FMGC. When you are in managed mode, a white dot will appear next to the numerical readout of the speed, heading, and altitude. You can fly the A380 in any mix of modes as well. For example, with the autopilot engaged, you can fly with speed in select mode with heading and altitude in manage, or any other combination thereof.

Multi-Function Display (MFD)

The Multi-Function Display is an area where the A380 differs from all other Airbus aircraft. The MFD gives the pilot a three in one tool. It can give the pilot performances; it is an MCDU, and it can also display aircraft information - aircraft manuals, systems, etc. However, the limitations of freeware change the use of the MFD. For a breakdown of the real MFD, refer to "Cockpit Check out" above. However, if you really want to learn about the full features of the MFD, there are a number of resources available to you on the Internet.

The MFD on this version of the A380 is still a great tool. The left screen displays information input on the FCU, as well as what radios are tuned to what. For this aircraft, all ILS information needs to be input into the NAV 1 radio. A digital read out of the ILS information is presented at the button of the screen. The middle screen - which can be changed by using the right knob on the EFIS control panel - is currently set to display gear and spoiler position. In its second configuration, it will display door information. The right screen is your traditional lower ECAM screen. It will display how much fuel you have left (kilograms on the left; pounds on the right), as well as Vibration (VIB), the oil pressure for each engine (OILPX, X being replaced with the engine number), and the oil temperature for each engine (OILTX).

This completes the A380 familiarization. We will now run through a basic start up, taxi out, takeoff, approach, and landing flight.

Tutorial Flight

The purpose of this flight is to familiarize you with the fleet installer A380. If you are flying another version of the A380, this tutorial will not be useful. We will be starting from the assumed "Cold and Dark" cockpit setting. We will assume that fuel loading and planning is complete and we can begin the cockpit preparation for departure. Because the A380 is a stage 5 program, we will assume you have an extremely in depth knowledge of aviation. By in-depth, we are assuming you know how to fly a SID and STAR, communicate with ATC, follow a taxi chart, and set up an ILS approach.

So, let's get started. Open up Flight Simulator and load the fleet installer A380 at the airport of your choice. Be sure to set your fuel and payload for the flight. This value will vary every flight, but I will be using an assumed value for demonstration purposes. For example, the weight I used on this flight was approximately 1,115,000 pounds; quite near MTOW. Before applying power, one must go through a set of safety checks.

Main Panel

1. Flight Director (F/D) .... ON

2. A/T and AP .... OFF

Landing Gear Panel

1. Gear Handle .... DOWN

Throttle Quadrant

1. Parking Brake .... SET

2. Engine Switches 1, 2, 3, & 4 .... OFF (Down)

3. Engine Ignition Selector .... NORM

4. Speed Brakes .... RET

4. Flaps .... 0 (Up)

5. Throttles .... IDLE DETENT

Overhead

1. Nav & Logo lights .... ON

Now, let's go ahead and apply power.

Overhead

1. Batteries .... ON
2. Electric Buses .... AUTO

3. Passenger signs ....ON
4. Fuel switches .... OFF

Throttle Panel

1. Radios................................. ON and TUNED

Now that you have the aircraft powered up, go ahead and call for clearance. Once you have obtained clearance, you will have the departure runway as well as weather information. The fleet A380 uses the default GPS for navigation. This may be programmed using the default flight planner within Flight Simulator, or via the GPS panel for a more direct route. At this level of your virtual career, you should be familiar with the default flight planner, as well as flight planning in general.

After the GPS is configured, the route is loaded, and all of your passengers are on board, we should complete the flight deck preparation based on the information obtained in the clearance.

Main Panel

1. NAV/GPS selector .... NAV
2. Barometric Pressure .... SET
3. Speed .... SET
4. HDG ....SET
5. Initial Altitude .... SET
6. V/S .... SET

Note: When approaching weights near MTOW, it is advised to use V/S of 2000 - 2500 fpm. Anymore, and you risk stalling. For weights 100,000 lb or more below MTOW, a V/S of 2500 - 3000 fpm can be used. However, these can change to less if your clearance calls for it.

It is now time for push back. If you are flying online using the client VATSIM, call for push and start clearance. Immediately prior to start, activate the beacon on the overhead panel. Once push and start clearance is obtained, release the parking brake and begin the push back. It is advised to start the engine start procedure during the push back sequence due to the fact of having four engines, and because the A380 engines can take some time to spool up.

To begin the start process, navigate to the overhead panel and switch the engine fuel cutoff switches to run. At the same time, you will see the red fire handle lights extinguish. The A380, like other Airbus, relies heavily on automated systems for engine start. Once at a part of the push back far enough away from the terminal, click the auto-start button below the fuel cutoff switches. This will begin the automated process of starting the engines. While the engines are starting, monitor the N1, N2, and EGT numbers via the ECAM panel and the MFD panel.

Once the push back is finished, re-set the parking brake. Once engine one has finished its start sequence, engine two, three, and four will begin their automated start sequence.

Now that the engines are started, navigate to the overhead panel and switch on the taxi light. If icing conditions exist, switch on the Anti-Ice. If flying online, call up ground and ask for taxi clearance. Once clearance is obtained, you will want to test your flight controls before releasing the parking brake and begin taxi. Upon completion of the flight control test, release the parking brake and set flaps 3 for takeoff (depress the F2 button three times).

Before you begin your taxi it is important to remember a few things about the A380. The first, and most crucial thing, is to remember that the A380 is a gigantic aircraft. You will need to take turns extremely wide and extremely slow. The aircraft has very little weight on the front nose gear and, if moving too fast, will tend to skid across the pavement. When taxiing on straight taxiways, remember not to exceed 20 knots, and when turning, do not exceed 10 knots.

Once at the runway, obtain takeoff clearance and taxi onto the runway. Once cleared for takeoff, perform the following tasks.

Takeoff

1. Strobes .... ON
2. Landing Lights .... ON

Once complete, advance the throttles until takeoff power is set. For a flight where your weight is within 200,000 lbs of MTOW, you will want to use the full takeoff power. Anywhere under 200,000 lbs of MTOW and on runways 10,000 feet or longer, you can use a derated setting. Once power is set, monitor for runway center line and power settings. Monitor your speed and at Vr pull back on the stick, maintaining a constant rotation of 3 degrees per second until 10 degrees nose up. Once vertical speed is established, select gear up and monitor for V_2+10 knots. For this flight, my V-speeds were V_1 = 150 knots, Vr = 160 knots, and V_2 = 170. Watch your speed as you climb out and remember to maintain the mandatory 250 knots below 10,000 feet, unless otherwise instructed by ATC. Once safely airborne, engage the autopilot and auto throttle, as well as depressing the speed, heading, and altitude buttons.

Continue out on the SID or by ATC's instructions and at 200 knots, set flaps to Flaps 1. At 220 knots, set flaps to up and continue to accelerate to your initial climb speed. Once given clearance to proceed as followed, depress the GPS button and track the turns to ensure you are aligned on the expected path.

Upon passing FL100, turn landing lights to off and accelerate to your final climb speed (somewhere in the neighborhood of 320 knots). Upon passing FL180, set the altimeter to standard. If you are cruising above FL230, toggle the SPD/MACH switch to MACH. While climbing, maintain a vertical speed to match your speed set. Once above FL250, and if no turbulence exists, switch passenger seat-belt signs to off. Continue climbing to your set cruising altitude. For an A380 near MTOW, this will be around FL300.

Cruise

Congratulations, you are now in the cruise phase. As you progress along your route and the fuel burns off, step-climbs may become appropriate. First reset your cruise altitude in the FCU to your new value. The VNAV should execute the climb to the new altitude. If it does not, click the V/S button and set the climb rate to 800 FPM to 1200 FPM. The aircraft should execute the climb the new altitude. If you are not using VNAV, you will have to adjust your target speed.

Descent & Landing

Once you are within 200 nautical miles of your arrival airport, go ahead and pull up the METAR for the airport. While you likely selected a runway for landing during your preflight, the weather will have changed and it may not still be the active runway.
Once cleared by ATC, you may begin your descent via the STAR. Manage your speed by selecting vertical speeds and, if needed, speed brakes. A good descent speed will be 290-300 knots. While it may not look it, the A380 likes to stay at high speeds because of its weight distribution, so remember to watch your speed! Upon approaching 10,000 feet, remember to slow to 250 knots, and maintain this speed below 10,000 feet. Also upon passing 10,000 feet, switch landing lights to on.

For this tutorial, we are expecting that you are flying an ILS approach. Tune the ILS frequency into your throttle quadrant. Once tuned and within range, check the MFD to ensure the correct ILS has been identified and the correct course is in. Continue your arrival towards your initial ILS approach fix. Continue slowing to meet speeds by ATC or as needed to meet your descent profile. At 220 knots, drop flaps 1. Plan to reach your ILS intercept point at the prescribed altitude and a speed of 200 knots. At 200 knots, drop flaps 2. When you are receiving the localizer and glide slope, depress the APR button on the FCU (Flight Control Unit). Observe the PFD and watch as LOC is captured and TRK is captured. This will indicate that your aircraft is now being controlled by the ILS. A good rule of thumb is to slow to 180 knots upon localizer capture or within 10 nautical miles of the airfield. You will also need to set auto brakes as needed for the runway

At 180 knots, drop flaps 3 and deploy the gear. Continue reducing your target speed to around 150 knots or needed approach speed by ATC. At 160 knots, drop flaps full.

Remember to maintain a stable approach and disengage the autopilot and auto throttle as conditions dictate. When 50 off the runway, retard the throttles to idle. At 30 off the runway, pull back to 3-4 degrees nose up. Upon touchdown, deploy the spoilers using the slash key (/) and manually deploy reverse thrust. When slowing through 80 knots, switch to manual braking. When slowing through 60 knots, disengage reverse thrust. Slow to taxi speed and turn off the runway.

Once off the runway, retract the flaps and set the speed brakes down.

Overhead

1. Strobes .... OFF

2. Landing Lights .... OFF

If ATC is present, obtain your taxi clearance and taxi to the gate. Once at the gate:

Overhead

1. Fuel cutoff .... OFF
2. Beacon .... OFF
3. Taxi light .... OFF
4. Seat belt sign ....OFF

Congratulations, you have just completed your first flight on the world's largest airliner, the A380!

Fuel Planning and Weight and Balance

Detailed Fuel Planning is covered in the Flight Encyclopedia. All burn rates are **per engine** and were measured at the maximum aircraft gross weight for the altitude and therefore should reflect the worst-case scenario.

ALTITUDE	INDICATED AIRSPEED	TRUE AIRSPEED	FUEL BURN
Ground Operations	N/A	N/A	3000 PPH
12,000’	320 KIAS	390 KTAS	5433 PPH
FL180	320 KIAS	425 KTAS	8609 PPH
FL240	320 KIAS	450 KTAS	8675 PPH
FL300	330 KIAS	480 KTAS	8900 PPH
FL360	285 KIAS	475 KTAS	8870 PPH

Note: Fuel burn tests were done at gross weight in clear weather. When flying normally, you may experience a fuel burn slightly less than those on the charts. Due to the complexity of the fuel burn chart to be worked up with different weight settings, we have simply tested it at gross weight to depict worst case scenario. Always take weather and winds aloft into consideration!

Fuel loading

Air France Virtual Airlines has a single variant - the A380-800 - in the fleet installer. Below is a list in pounds and kilograms of the maximum amount of fuel that can be placed in each tank.

MODEL/TANK	LEFT AUX.	LEFT	CENTER	RIGHT	RIGHT AUX
A380-800 (LBS)	80,391 lbs	120,345 lbs	146,666 lbs	120,345 lbs	80,391 lbs
A380-800 (KG)	36,464 kg	54,587 kg	66,526 kg	54,587 kg	36464 kg

To load fuel into your aircraft, select Aircraft, then Fuel and place the correct amount of fuel in each tank.

Fuel loading procedure

Follow the fuel loading procedure and keep in mind that if there is more fuel left over after loading a step in this process, proceed to the next step.

1. Load the left, left aux, right and right aux evenly.
2. With the left aux and right aux tanks full, fill the left and right main tanks
3. Next add fuel to the center tank until full

Airbus A380-800 Fuel Planning Example

1200 NM flight at FL300
Alternate distance of 250 NM

Flight Time 480 KTAS/60 = 8 NM per minute.
1200NM/8 = 150 minutes.
Add an additional 10 minutes fuel burn during climb and descent
150 + 10 = 160 minutes/60 = 2.66 hrs (round up to 2.7)
Total Flight Time = 2.7 hours

Zero Fuel Weight – 796,000 lbs
Unusable = 65 lbs
Ground Operations = 3000 lbs
Flight = 2.7 hrs * 8900 PPH = 24,030 lbs
Alternate = .5 hr * 8900 PPH = 4450 lbs
Reserves = 45 minutes (.75 hr) * 8900 PPH = 6675 lbs
Holding = .5 hr * 8900 PPH = 4450 lbs
Total fuel per engine – 42,670 lbs
Total fuel (42,670 * 4 engines) = 170,680 lbs
Ramp Weight – 966,680 lbs

Fuel Load: Left, Left AUX and Right and Right AUX should be filled equally until full. In this example, each tank should be loaded with 42,670 pounds of fuel.

Emergency Procedures

Although Microsoft Flight Simulator does not do a very good job simulating emergencies, Air France Virtual Airlines pilots may encounter some of the critical situations outlined in the following sections.

Rejected Takeoff

- Only attempt a rejected takeoff before V_1. Once V_1 has been reached the aircraft is committed to flight and must take off.
- If auto-brakes are set properly (to RTO) braking will be automatically applied when the throttles are returned to idle.
- Apply reverse thrust as needed, and deploy spoilers to reduce lift and increase braking effectiveness.

Stall Recovery

- A stall occurs when a wing reaches a critical angle of attack. Regardless of load factor, airspeed, bank angle or atmospheric conditions, a wing always stalls at the same critical angle of attack.
- There is only one way to recover from a stall – reduce the angle of attack of the wing. Apply forward pressure on the yoke, and increase thrust to increase airspeed and minimize loss of altitude.
- At low altitudes, add full thrust for later climb and monitor altitude closely. A low altitude stall is an exceptionally dangerous situation and the loss of altitude in recovery can be fatal.
- At high altitudes and speeds, lower the nose and do not add thrust to prevent an over speed condition. After recovery, select a lower altitude.

Single Engine-Out

- Today's modern turbofan engines make engine failure an exceptionally rare situation. However, during takeoff engine failure is a critical condition that must be addressed immediately.
- Until V1, a takeoff must be rejected. After V1, maintain pitch and V2 until 1000' AGL. Retract flaps and reduce climb rate to maintain airspeed while providing for adequate terrain and obstacle clearance. If turns are required, limit bank angle to 15°.

Missed Approach

- Execute Missed Approach if at minimums with no visual reference, or if uncomfortable with the landing. Never try to salvage a landing out of a poorly executed final approach.
- Call for maximum thrust and pitch up 15°.

- Landing Gear UP. Engage autopilot missed approach course.

All Engine Failure

- Due to the fact that the A380 has only been in service for less than 5 years, no A380 has suffered a complete engine failure to this date. Despite the rarity of such an occurrence, 4-engine failure in Flight Simulator is possible due to fuel starvation.
- From FL390, a gliding A380 has a range of approximately 120 nautical miles. Pilots should aim to reach a point 30 miles from the destination airport at no lower than 12,000' MSL with the aircraft still in a clean configuration.
- In such a situation, leading-edge devices would not be available due to lack of hydraulic pressure, and the approach speed should be increased by 20 KIAS as a result.
- **You have only one attempt at the landing**. Fly over the Outer Marker at an altitude of at least 1,500' AGL, and after this point extend the landing gear and full flaps. Keep the spoilers as backup in case you are too high on the approach. The goal is to conserve altitude and airspeed, then bleed them off with flaps and spoilers when no longer needed.

Emergency Descent

- Emergency descent from high altitude must be completed within the aircraft's safe operating parameters. The maximum operating speed (M_{mo} of Mach 0.93 must **not** be exceeded – bleed off airspeed before commencing descent, and use spoilers and slats/flaps to keep airspeed within a safe range during the descent.

  Note: All Airbus emergency procedures authorize the landing gear to be used as a last resort method to help keep the aircraft below M_{mo}.

Crew Briefings

Takeoff

Captain to Co-pilot

We will be taking off on RWY (active runway), climbing to (altitude). If we encounter an engine malfunction, fire or other emergency before $\mathbf{V_1}$ (critical engine failure recognition speed) KIAS, the flying pilot will retard the throttles to flight idle and bring the aircraft to a complete stop on the runway. The non flying pilot will notify the proper ATC of our intentions and assist the flying pilot as requested or needed to operate the aircraft in a safe manner.

If the aircraft has reached $\mathbf{V_r}$ (rotate speed) KIAS, the flying pilot will fly the aircraft per company procedures and the non flying pilot will notify the appropriate ATC of our intentions and assist the flying pilot as requested or needed to operate the aircraft in a safe manner and land the aircraft as soon as possible.

Aircraft Weight is: ______ Taxi Instructions to Active: _________

V Speeds for this flight are (calculated) See prepared Flip Chart(s)

Flap Settings: Takeoff _____ Engine Failure Approach ______

Discuss the Departure Procedures for this flight (Ref Charts, SIDs)

Discuss Weather considerations (Ref ATIS, METAR, TAF)

Landing

Captain to Co-pilot

Weather conditions are (obtain from ATIS, Metar and TF).

Landing on RWY (active runway) at (airport) using the (**???**) approach (Ref STAR)

Descend at (**???**). Our Final Approach altitude will be (**???**)

V Speeds for this approach are (calculated) (See prepared Flip Chart(s))

Missed approach Procedures are (Ref Approach Plates)

Taxiway Turnoff ______

Taxi Route from Active _________________

Parking at Gate (**#**)

Crew Announcements

Departure

"Ladies and gentlemen, on behalf of the flight crew, this is your (captain or first officer) (insert name), welcoming you aboard Air France Virtual Airlines flight number (flight) with service to (destination). Our flight time today will be approximately (time en route) to (destination). At this time, I'd like to direct your attention to the monitors in the aisles for an important safety announcement. Once again, thank you for flying Air France Virtual Airlines."

Climbing above 10,000 feet MSL

Inform cabin crew that use of approved electronic devices is authorized.

At Cruise Altitude

"Ladies and gentlemen, this is your (Captain or First Officer) speaking. We've reached our cruising altitude of (altitude). We should be approximately (time) enroute and expect to have you at the gate on time. I've turned off the fasten seatbelt sign, however, we ask that while in your seat you keep your seatbelt loosely fastened as turbulence is often unpredicted. Please let us know if there is anything we can do to make your flight more comfortable, so sit back and enjoy your flight."

Approach

Inform the cabin crew of approach and to discontinue the use of electronic devices.

Landing

"On behalf of Air France Virtual Airlines and your entire flight crew we'd like to welcome you to (destination) where the local time is (time). We hope you've enjoyed your flight with us today and hope that the next time your plans call for air travel, you'll choose us again. Once again, thank you for flying Air France Virtual Airlines."

Appendix - Operating Information

Taxi Speeds

Do not exceed 20 knots on straight taxi ways. Do not exceed 10 knots in turns and when approaching gates or other parking areas.

Exit high speed taxiways at no more than 35 knots, and low speed taxiways at no more than 15 knots.

Typical V- Speeds

WEIGHT	V SPEED	KIAS
1,234,590 lbs (flaps 3)	V1	112
	VR	148
	V2	161
780,000 lbs (flaps 3)	V1	103
	VR	123
	V2	142

Due to the infinite number of weights, we are only able to list a general V-Speeds chart. Actual speeds will vary with weight, but this chart can be used as a reference.

Maximum Flap Speeds

FLAPS DEGREES	KIAS
1	263
2	240
3	218
Full (4)	195

Climb Profile

SPEED	ALTITUDE
V2 + 10	2,000 ft
250 KIAS	10,000 ft
320 KIAS	FL240
.82 Mach	FL330
.84 Mach	Cruise

Standard Climb Profile

FPM	ALTITUDE
2000-3000	10,000 ft
1800-2500	FL200
1300-1800	FL260
1000-1500	Above FL260

All climb figures are based upon a MTOW takeoff and are only valid for MTOW takeoffs. For takeoffs under MTOW, these figures will increase based upon your weight.

Descent Profile

SPEED	DESCENT RATE	ALTITUDE
290 KIAS	2000 FPM	10,000 ft
250 KIAS	1600 FPM	Below 10,000 ft

Actual descent will vary based upon ATC and your flight plan. Your speeds and the descent rate may also change based upon your weight and proximity to the airport.

Approach Speed Profile

SPEED	ALTITUDE	DISTANCE FROM AIRPORT	FLAPS
240 KIAS	Below 10,000 ft	30 nm	0
200 KIAS		15 nm	1
190 KIAS		10 nm	2
160 KIAS	Varies	5 nm	3

These speeds can and will vary based upon your flight and ATC requests. This chart gives a general pattern to follow if flying offline with no ATC and near the target weights used as an example in this manual.

V-Ref Speeds

WEIGHT	SPEED
620,000 lbs (flaps 3)	128 KIAS
620,000 lbs (Flaps Full)	117 KIAS
970,000 lbs (Flaps 3)	158 KIAS
970,000 lbs (Flaps Full)	149 KIAS

Please use this chart as a reference as to where your values should be. Due to the infinite amount of landing weights, it is not possible to list all V-Ref speeds. However, this chart should give you an idea of where your speeds should be.

Acknowledgements and Legal Stuff

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While we strive to mirror real-world operations, this manual is not designed for use in the operation of real-world aircraft.

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