

# PROJECT AIRBUS A320 FD

## SPECIAL VERSION v2.0

### CFM Engines version & IAE Engines Version

With adaptation Stefan Liebe's Panel  
callout gauge by Doug Dawson,  
adapted by permission by François Doré v 2.0 – April 2012

## User Manual



## TABLE OF CONTENTS

<b>1</b>	<b>Copyright &amp; Authors.....</b>	<b>p.3</b>
<b>2</b>	<b>Overview and installation.....</b>	<b>p.4</b>
2.1	Overview.....	p.4
2.2	Aircraft installation.....	p.4
2.3	New textures installation .....	p.5
2.4	<b>Read before fly.....</b>	<b>p.6</b>
<b>3</b>	<b>Panel's new functions.....</b>	<b>p.7</b>
3.1	Primary Flight Display (PFD).....	p.7
3.2	Navigation Display (ND).....	p.9
3.3	Primary ECAM .....	p.13
3.4	Secondary ECAM .....	p.15
<b>4</b>	<b>Verticale navigation gauge ( VNAV ).....</b>	<b>p.16</b>
4.1	New Autopilot.....	p.20
<b>5</b>	<b>Slats &amp; Flaps Computer controler ( SFCC ).....</b>	<b>p.21</b>
<b>6</b>	<b>Autoflare (autolanding) et Callout system.....</b>	<b>p.22</b>
<b>7</b>	<b>Autobrake &amp; RTO.....</b>	<b>p.24</b>
<b>8</b>	<b>VC day lighting.....</b>	<b>p.25</b>
<b>9</b>	<b>About Fly By Wire (FBW).....</b>	<b>p.27</b>
<b>10</b>	<b>Pilots tip Project Airbus A320.....</b>	<b>p.29</b>
10.1	Manual engine start-up.....	p.30
10.2	Flight instructions & procedure.....	p.31
10.3	Aircraft features & data.....	p.33
<b>13</b>	<b>Troubleshootings.....</b>	<b>p.34</b>

**Important ! : You must select in the FSX SETTINGS – REALISM : “Display indicated air speed” : See chapter 4.1**

## **1 Base pack Project Airbus Aircraft Copyright :**

The original aircraft model (A320) is **copyrighted by Project Airbus**. I thank Project Airbus Team for their amability to authorize me to make this version of their airplane. Please, read the « original Project Airbus Readme.txt » file at the root of the aircraft folder  
The Frontier texture of this pack is officially **released and copyrighted by Project Airbus**.

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### **Project Airbus credits :**

Andy Warden, Derek Mayer, Peter Binamira, Demetris Themistocleous, Steve Mcbee, Alessandro Savarese, Thomas Ruth, John Tavendale, Gianmarco Bettiol, Alexander Kvitta, Trevor Slack, Nicholas Wu, David Bromwich, Matthey Murray, Tom Collins, Terence Pereira, Dickson Chan, Sheldon Fernandes, Ben Jones, Manny Osias, Spike Acenas, Mark Bolatete, Kester Masias.

**Special thanks to Derek Mayer of Project Airbus Team.**

### **Stefan Liebe Panel A32X Copyright**

The Original Panel used in this aircraft (folder « \PA320FD\Panel\A320.cab is my adaptation of the A32X panel by Stefan Liebe. I have got Stefan Liebe Authorization to make this changes. The original A32X panel is **copyrighted by Stefan Liebe**.

I thank Stefan Liebe for his friendliness to authorize me to change some values in his xml files to allow them to operate with The Project Airbus Aircraft.

All other modifications has been realised by François Doré.

**Do not use this A320 panel with another aircraft, because xml files are specific with the original Project Airbus A320 aircraft !**

### **Doug Dawson CALLOUT\_SOUND.DLL v3.8.2.0 Copyright**

The Original CALLOUT\_SOUND.DLL is **copyrighted by Doug Dawson**.

If you want to use the CALLOUT\_SOUND.dll VERSION 3.8.2.0 you need the permission of Doug Dawson !

Many thanks to Doug for allowing me to use his gauge

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**I thank Nicolas chung for the authorization it gave me to join its high quality textures in this pack !**

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### **François Doré Copyright**

The vertical navigation gauge include in the A320.cab is my own creation and it is copyrighted by François Doré

All the other modifications of the .cfg, .htm and .xml files of this bundle are under my responsibility, with the permission of the authors previously cited

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The checklist and reference files, for Kneeboard, have been realised by **Jean-Pierre Varnier** ; Special thanks to him !

The original authors are not responsible for the changes I made to their files, You can not ask them for support of this aircraft version. The installation and use of all of these files is at your own risk.

Many thank to forum's members <http://www.pilote-virtuel.com/> for help me to debug this aircraft (special thanks to **Fonta and Jean-Pierre Varnier** )

If you have any questions, you can contact me : **François Doré** [Fdd\\_fr@yahoo.fr](mailto:Fdd_fr@yahoo.fr)

## 2 Overview and installation

### 2.1 Overview

**Excuse me for my bad english, but I am French.**

I have decided to adapt Stefan Liebe's Panel to the Project Airbus A320, adding new functions and features. This aircraft, originally designed for FS9, works perfectly under FSX.

**This special version is only designed to work with FSX ; ( also SP2 and Acceleration pack).**

The aircraft is equipped with a 3D virtual cockpit and 2D cockpit traditional. Instrumentation is a mixture of components for the Airbus A321 original FSX, Project Airbus Panels and Panel Stefan Liebe.

The challenge was to adapt the Panel A32X Stefan Liebe, which was not compatible with basic A3xx From Project Airbus, and I have corrected some minors bugs and added some new features.

Stefan Liebe made a number of functional elements in the Cockpit mode as TOGA (Take Off and Go Around) with a button on the throttle panel and autobrake with 4-position (Gear panel and VC). It has complete instrumentation.

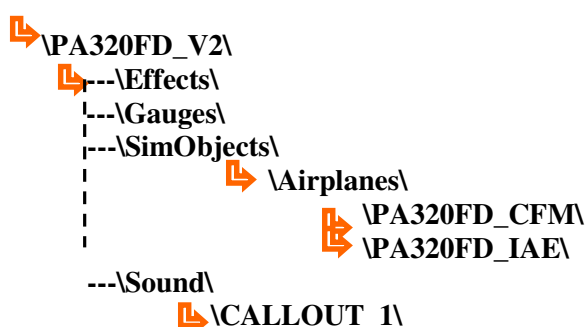
**Important: For a practical question, I modified the command to the mouse buttons Push-Pull the autopilot (SPD buttons, ALT and HDG) whether in the Virtual Cockpit or 2D in the Cockpit To activate or deactivate them, use the right mouse button; settings + or - buttons remain assigned to the left. I found that this solution was more ergonomic and avoid any risk of incorrect operation.**

Personally, I realized for this A320, a Management Vertical Navigation gauge (VNAV) I have modified it to the autopilot controls the climb speed , if needed recalibrating the IAS according to altitude prevent the risk of overspeed reached cruising altitude.

You can find more details on these new features in the following pages.

### 2.2 Installation

Unzip this package in a temp folder  
You get the following folders



**There are 2 folders for the aircraft depending of the engines. Indeed, the CFM model has wingflex and hardcoded wings lights, while the IAE version has fixed wings and classical wings lights. So, its cannot use the same aircraft.cfg and I had to separate them. So, be carreful when you install a new texture : check the type of engines used !**

- Copy the files that are in the \Effects\ folder to your « ....\Flight Simulator X\effects\» folder ( replace if you are already a file)
- Copy the file « CALLOUT\_SOUND.dll » that are in the \Gauges\ folder to your « ....\Flight Simulator X\Gauges\» folder
- Copy the « \PA320FD\_CFM\ » folder and the « \PA320FD\_IAE\ » folder that are in the \SimObjects\Airplanes\ folder in your « ....\Flight Simulator X\simobjects\airplane\» folder
- Copy the « \CALLOUT\_1\ » folder in your « ....\Flight Simulator X\Sound\» folder ( replace if you are already a file)

You can run now FSX ; It will ask to you if you accept the « calloutsound.dll », answer by « yes ». You can fly now !

#### Bonus :

- Aircraft comes with the AES configuration file (Aeroport Enhanced Services) for those who use it.
- You will find in the aircraft folder a folder called « Ezdok Camera & vibs » ; there are in this folder some sepcific cameras and vibrations files for this aircraft if you use Ezdok Camera software.
- AES is COPYRIGHTED by AEROSOFT
- Ezdok Camera is COPYRIGHTED by EZDOK SOFTWARE



## 2.3 New textures installation

You will find on the net many textures for the Airbus A320 Project. They may be in different forms:

- Either with the original airplane Airbus Project
- Or just the texture.

Whatever the case, unzip the file in a temporary folder and copy only the texture folder that can be called only « texture » (in this case, you must rename it in *Texture.xxxxx* or you will overwrite my original texture folder that contains VC texture).

Copy only the *texture.xxxx* folder in the .... \SimObjects\Airplanes\PA320FD\ folder

### Don't copy other files – Only the Texture.xxx folder !!

When you have installed your new texture, go to one of the original texture of my plane , and copy the « texture.cfg » file and paste it in your new texture.

Now, you must declare your new texture in the Aircraft.cfg file :

Open it in « \PA320FD\_CFM or \_IAE\ » folder (check engine type) and add a [fltsim.x] section (x is the next free number of texture list).

Follow the syntax :

**In green =: Write like below**

**in blue= Data that you must found** : see the txt file comes with your texture

**in black = FSX values that must be write**

**Warning : There are 2 exterior models (A320-100 et A320-200) and 2 engines folder : Look for the information file comes with your texture for set correctly « Model », « Sim » and « Sound » lines.**

The versions include in this pack are the latest versions of the Project Airbus A320 : Version 2.1 ; so, when you download a texture, the readme file with the [fltsim] information may show different model or engine name : You must use the name that are below ; For example, you can find in the Sim line the name « **pa320-cfm56** » ; You must rename it in « **pa320-cfm56-2** »

[fltsim.xx]

**title = PA320\_CFM New Airlines** ---> for texture with CFM engines or **PA320\_IAE New Airlines** for texture with IAE engine ; select the right folder to install !

**sim = « pa320-cfm56-2 »** for CFM model or « **pa320-v2527** » or « **pa\_A320-200\_IAE** » for IAE models.

**model = CFM-100 or CFM-200 or IAE-100 or IAE-200** (see your texture model)

**panel= keep empty !!!**

**sound = « CFM » or « IAE »** (see your texture model)

**texture = Name of your texture folder**

**kb\_checklists=AirbusA320\_check**

**kb\_reference=AirbusA320\_ref**

**atc\_id = Choose your ID aircraft**

**atc\_airline = Name of the airline company**

**atc\_flight\_number = Your choice**

**ATC\_PARKING\_CODES = ICAO code (3 chars)** of your airlines company (you can write 2 or 3 ICAO code with « , » separator)

**atc\_parking\_types = GATE,RAMP**

**ui\_manufacturer = Airbus**

**ui\_variation = ID**

**ui\_createdby = Project Airbus**

**ui\_type = A320 – CFM or IAE**

**ui\_typerole=Commercial Airliner**

**visual\_damage = 1**

**atc\_heavy= 0**

**description = Presenting the Project Airbus A320-xxx. Visual model by Andy Warden and Derek Mayer. Base textures by Demetris Themistocleous and Sheldon Fernandes. Flight model by Peter Binamira, Derek Mayer, and Steve Mcbee. +**

**Name of repaint author Copyright Project Airbus 2008.\n\n\n\n\n**

The easiest way is to copy and paste an existing section of textures that I have provided in this pack and change only the rows that should be updated (which is blue)

### Do not get confused between CFM and IAE folder !!

## 2.4 Read before fly

**Before taking the control of this special version of the Airbus A320 Project Airbus, you simply must get knowledge of the following:**

- The autopilot Push-Pull buttons (Speed, ALT and HDG) is set on or off with the **right mouse button**; by cons, their settings (+ / -) is always with the left button.
- This Airbus has the **Fly By Wire (FBW)** function. Please refer to Chapter 9 for information regarding the consequences of this mode, because when it is active, manual control of the aircraft is greatly changed. It is deactivated by default.
- I created a gauge for this aircraft, **which manage vertical navigation** (to simulate a very basic function of a FMC at that level). It is controlled from the dashboard by the button "VNAV". Chapter 4 will give you all the explanations needed to properly use this mode.
- The Aircraft management of the speed is linked to a **transition altitude of 25,000 feet**. Below this altitude, the autopilot can display operates in IAS or MACH mode. Above this altitude, the display mode switches must MACH. From that moment, the aircraft climb will be at MACH constant, ie that the autopilot automatically recalibrates the speed according to the altitude. Refer to Chapter 4.1, regarding the operation of the autopilot.
- By default, the **vertical velocity** of the autopilot is **set to 0**, which means that if you change altitude, You will must set the VS (vertical speed) every time. This is in order to be as faithful as possible to the real control of the aircraft and also to avoid any malfunction with the vertical navigation gauge that I made for this plane.
- The **TOGA** mode (TakeOff & Go Around) is available on this aircraft. In case of use of TOGA, the vertical velocity does not come into play; The aircraft will climb at an incidence (Pitch) fixed of 12 degrees.
- The management of Airbus flaps & slats, called "**SFCC**" is supported on this aircraft; Please refer to Chapter 5 to be aware of how this management system.
- I have with the plane of a "**day lighting**" of the **Virtual Cockpit**, for certain specific reasons. This function requires special handling in certain cases, please refer to Chapter 8 for more details on this éclairage.
- The aircraft is equipped with an **Autolanding system** (or Autoflare) This can not work miracles and it has limitations; Please refer to Chapter 6 for the operation of the Autolanding.
- Load a **saved flight** has consequences on Fly By Wire. Refer to the relevant chapter for more details.
- The plane is set to be susceptible to be subject to **icing problems** of engines, wings and pitot probe following conditions weather forecasts; So make sure to enable adequate heating systems if these conditions arise.
- You must adjust **FSX realism setting** about indicated speed to "**Display Indicated airspeed**" : See picture 22, page 20, chapter 4.1. If not, Autopilot will not properly works !!
- Fuel system is not realist on this aircraft, so you havn't to setup it.

### 3 Panel's new functions

**In VC (Virtual Cockpit), each panel can be a popup window by click mouse**

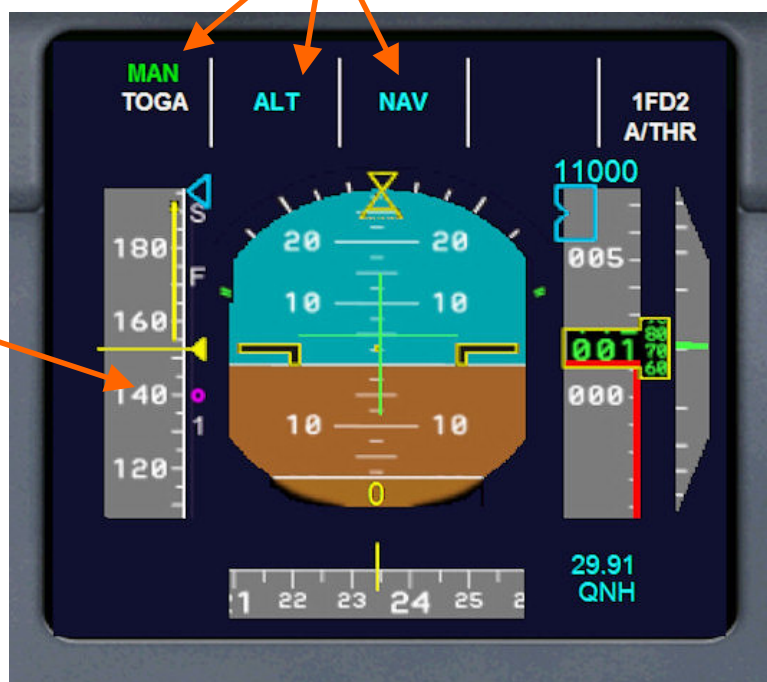
#### 3.1 Primary Flight Display ou PFD

I have added the indications on the PFD on the new features of the aircraft, as the gauge which manages vertical navigation (the aircraft climb on autopilot).

Here is the display of the PFD, taking off, after arming the NAV and ALT modes, with engine thrust mode TOGA.

cyan indications show that a system is armed but not in action. Here, ALT and NAV modes are armed but not in action. Take Off is in manual mode, with Auto Throttle engaged in TOGA.

Magenta point is Vr, for Rotation speed, calculated with the aircraft weight and flaps configuration. The '1' is V1, the maximum speed to reject take off.



Picture 1

#### PFD new features

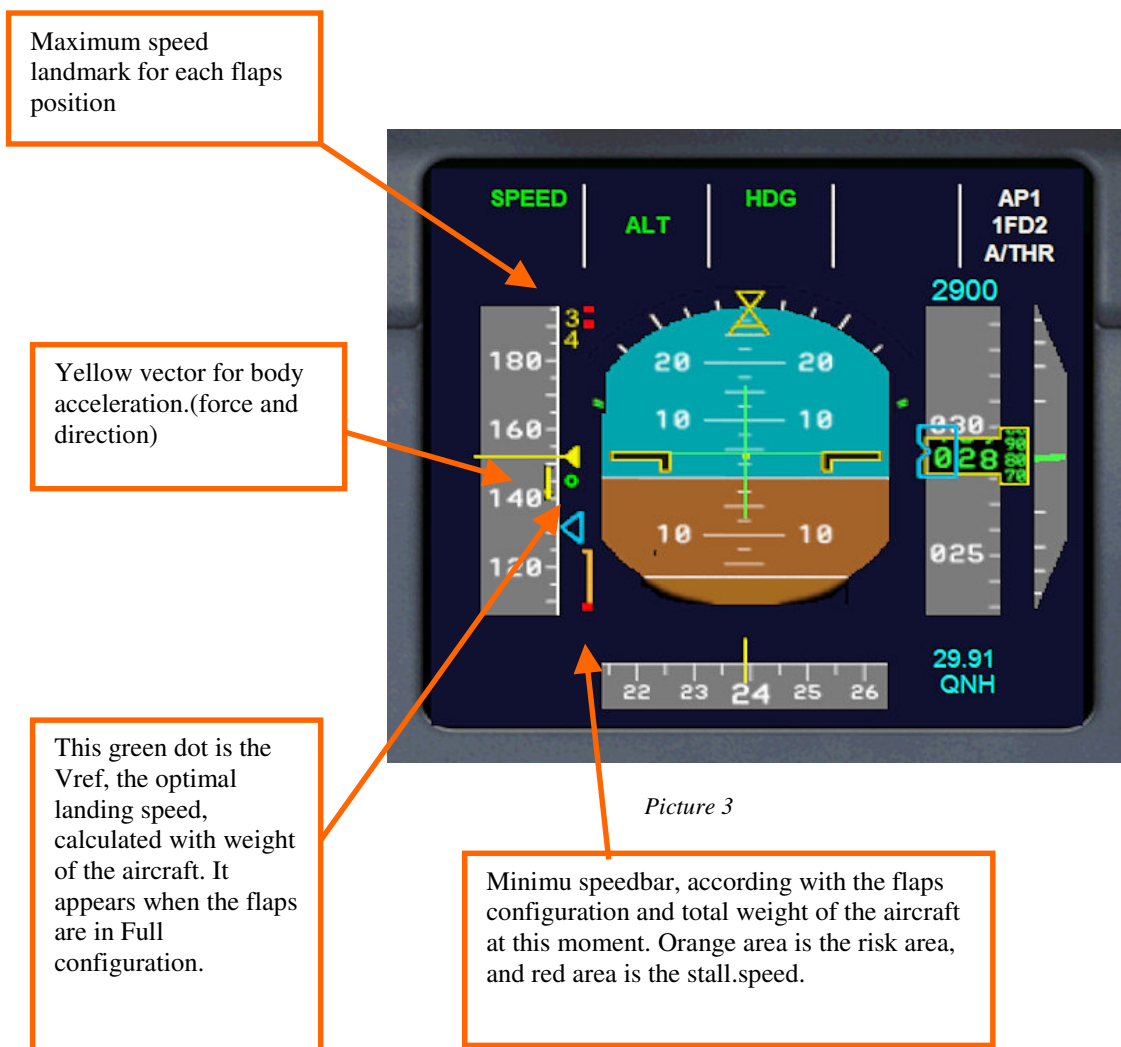
- Now shows max and min speed on ASI (according flaps configuration and weight for min speed and altitude for max speed)
- Shows min & max speed for each flaps position
- Shows V1 et Vr information for Take Off ('1' is V1 Magenta dot is Vr)
- Shows Vref for landing in Full Flaps configuration (green dot)
- Shows the management state of my vertical navigation gauge
- Shows Cat, frequency et DME of ILS
- Shows « Decision Height », set by default at 200ft, with adjust value by clicking on with mouse
- Shows when TOGA mode is engaged (TOGA button in popup throttle panel or programming key)
- AP Altitude can be display in feet (default) or Flight Level if the aircraft is above 5000ft.
- Shows yellow vector acceleration on ASI

Green indications show that systems are activated. In this screenshot, aircraft has just taken off In TOGA mode and VNAV mode ( THR CLB indication, see chapter 4 for informations about VNAV mode), with Autopilot activated in HDG mode .



Picture 2

You can display PFD, ND(MFD) and ECAMs screens in popup window by clicking on it in the virtual cockpit.



Picture 3

You'll find out more about the new features of the PFD to reading the chapters 4 (VNAV) and 6 (Autoflare)



### 3.2 Navigation Display : ND on Airbus Aircraft (MFD equivalent)

MFD (ND is Airbus name for Navigation Display) displays navigation informations. It has multiple display mode (ILS, VOR, NAV, ARC, PLN ). Distance scale can be adjusted by the scale map selector. For example, here is the ARC mode, with a GPS flightplan.



Picture 4

**VNAV** button is no realistic. In reality, its name is CSTR, but its original function isn't managed by this aircraft. So, I have used this button for my Vnav Gauge (and I renamed it (go to chapter 4 for more information)).

- ARPT = For display airport
- NDB = For display NDB
- VOR = For display VOR
- WPT = For display waypoints



Picture 5

Scale map ND display selector.

ND display selector.

**Note :** This aircraft use the Virtual cockpit file of the Airbus A321 of FSX. In this version, I have edited and modified this file (Airbus\_A321\_interior.mdl) which is located in the models folders (IAE and CFM) and I have activated the 5th position of this selector (PLN position) which not in used by default aircraft. Now, with this position, you can display a radar map, with terrain and also airborne traffic in real time. See page 12 for more information.

Here is the ND display NAV mode, at airport departure, with ILS beam.



In GPS mode, this is the next waypoint with its ID, and the remaining distance to be traveled to this waypoint. If you click on this area, you will activate **Flight Plan information page** (see page 11 for more information).

In GPS drive, this is the last waypoint, your airport destination (with ICAO Identification code), with the remaining distance to it. If you click on this area, you will display a page about **Airport destination informations** (Elevation, runways, frequencies...). See page 11 about this.

Picture 6

Here is in ILS mode



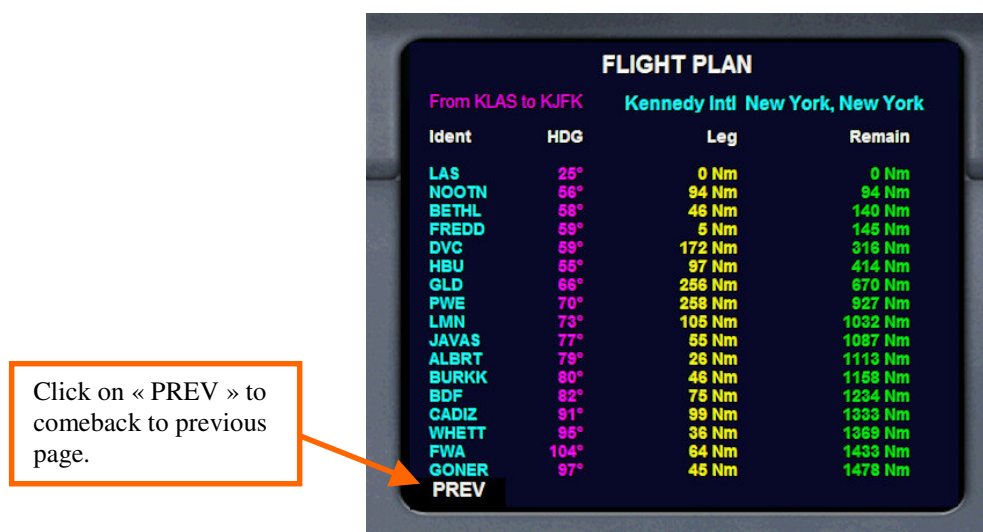
ILS identifier with distance if it is a DME

Picture 7

You can view now on the ND, all the information together (airports, beacons, waypoints etc ...).

We will now see two display mode of the ND that do not exist on a real Airbus, but I have implemented in order to access usefull informations during a flight, without using the FSX GPS whose operations are inconvenient.

If you click on the bottom left area of the ND display, on the next waypoint area (page 9, image 4), an information page of the flight plan will be displayed on the ND.



Picture 8

It will then display the ICAO code for your departure and arrival airports, the name of the destination airport and the list of waypoints in your flight plan. If your flight plan waypoints behave over 17, they will not be displayed all at first. But as far as to flight as soon as a branch of the flight plan is completed, the corresponding line disappears and all lines are shifted upward; Thus, all the legs will emerge during the course of flight to final destination. You can view this Flight Plan Page at any time of your flight, because it is updated continuously. To return to previous page, click “PREV” on bottom left.

If you click on the bottom right area of the ND display, on the “DEST” area (page 9, image 4), an information page about your destination airport will be displayed on the ND. This gives you essential information about your airport destination, such as radio frequencies, runways and their orientations, ILS frequencies



Picture 9

By clicking on the bottom right area, you comeback to the ND previous page.

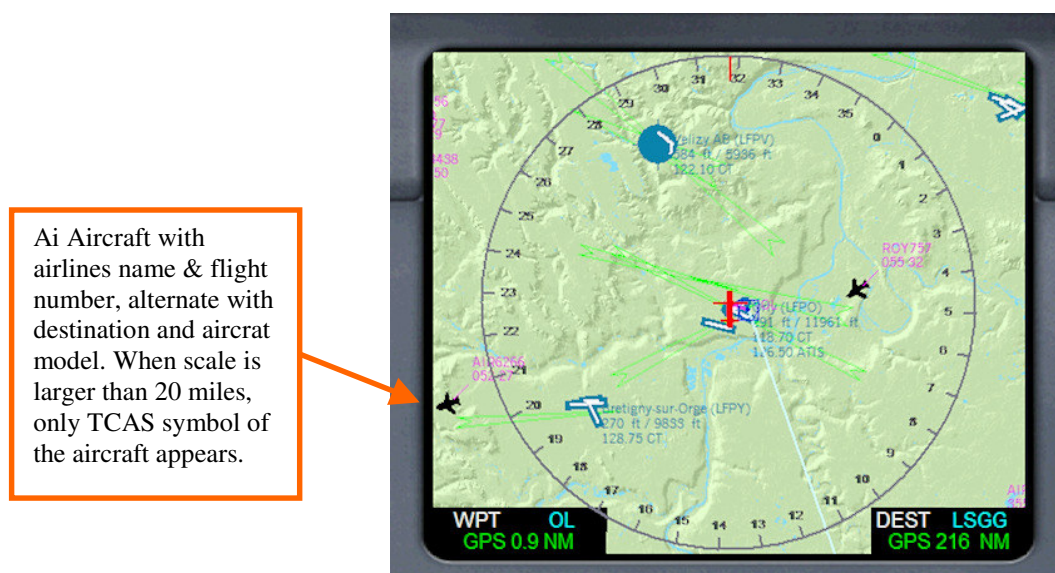


You can now display the radar map on ND, with the ND selector knob on PLN position, and select the information to display with the ARPT, VOR, NDB, WYPT buttons.



Picture 10

You can select the scale with the selector knob. Detail of each information showed depend of the scale. You can see AI traffic in real time, but the map is refreshed only when your aircraft move.



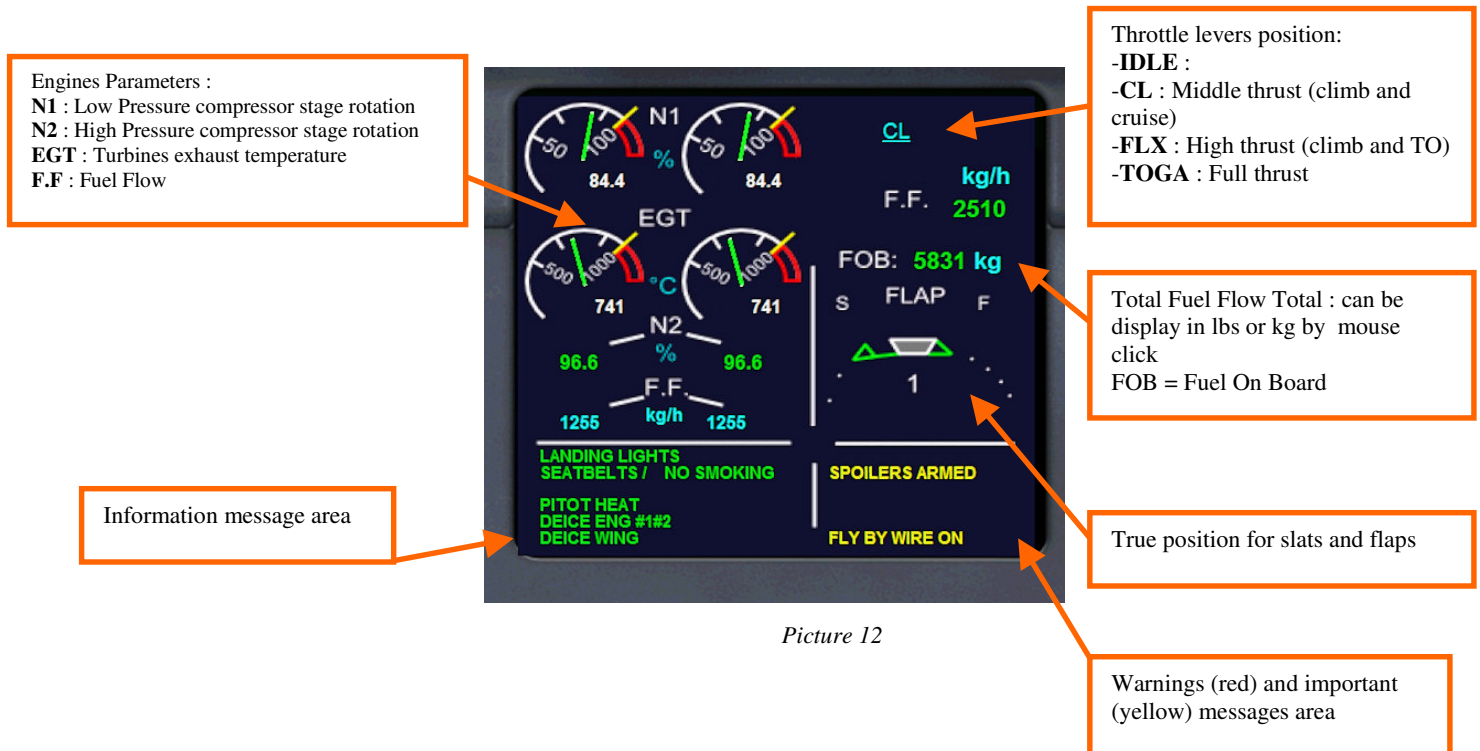
Picture 11

Caution : The radar map may be a « FPS killer », according to the level of detail that you have chosen, the density of your scenery and the density of AI traffic.



### 3.3 Primary ECAM.

Primary ECAM shows engines datas, flaps configuration, fuel flows, and informations or warnings messages.



Picture 12

Another example of ECAM messages



Picture 13

Flaps and slats display is the real position on this Airbus

- | 5 Flaps configuration : | Position                  | Use to...                        |
|-------------------------|---------------------------|----------------------------------|
| 0                       | = (Slats 18°)             | Approach                         |
| 1+F                     | = (Slats 18° + flaps 10°) | Approach and Take Off            |
| 2 bec                   | = (Slats 22° + flaps 15°) | Approach and short Take Off      |
| 3                       | = (Slats 22° + flaps 20°) | Approach and very short Take Off |
| F (full)                | = (Slats 27° + flaps 40°) | Landing                          |

See chapter 5 about Airbus flaps & slats automatic management (SFCC)

### 3.4 Secondary ECAM

Secondary ECAM has multiple pages, to display the status of various aircraft systems (hydraulics, pressurisation, fuel tanks levels, APU power, flight controls)

Stefan Liebe has added a checklist function for each stage of the flight.



*Nota : fuel system is not realist simulated on this aircraft.  
Picture 14*

Each bottom button gives access to a page on the affected system

Pressurisation page for example

Checklist button which permit to access to all the checklist forms.



picture 15

TAT is temp of aircraft body, SAT is outdoor temp, ZULU is GMT time , LOCAL is local time and you can see also the total weight of the aircraft at this moment.

In VC mode, you must click on the ECAM screen to show the popup window for checklist button appears. When you have activated the checklist page, you can close the popup window ; The buttons that are in the checklist pages can be clicked in the VC.

Popup window is just necessary to get access to the top left checklist button.

The first page that appears gives all the checklist page for each flight stage. Either you select a phase directly by clicking the SEL button or you can do in order with PREV and NEXT buttons



picture 16

Here is the *GATE DEPARTURE* page for example



picture 17

Lines that contain the SEL button correspond to systems not managed by the plane, so pressing the button will turn on the green light.

There is a page for each flight stage and Stefan Liebe has a great product especially for a stupid distracted like me.

## 4 Automatic management vertical navigation gauge ( VNAV )

I have created for those who like me, do not use FMC, a management of vertical navigation gauge.

This gauge, allows the autopilot to manage the process of aircraft climb during each phase of the latter, taking into account the weight of the aircraft.

The rate of climb (vertical speed - VS) curves are determined by four different programmed, and cut the rise in 11 phases:

This gauge works invisibly in the background. To use, you must complete a number of conditions, some of which are controlled by the gauge and the other not as uncontrollable (for the latter, it means that it is your responsibility to remember to required actions).

VNAV mode can be activated on the ground (before takeoff) or in the air, allowing in the latter case, turning it in succession, follow the different levels are given by FSX ATC or by an network ATC like VATSIM, Ivao ....

VNAV for the work, you must create the conditions are:

### CASE 1: At take-off:

- The engines must be started (checked condition)
- Having armed the autothrottle (A / THR) (checked condition)
- It should have set the autopilot altitude of at least **3,000 feet** (checked condition)
- Having set the flaps 1 + F minimum (condition not verified)
- Having set the barometer atmospheric pressure for the altimeter (condition not verified)
- You must set the course of the runway in the HDG (condition not verified)
- From here you can harness the gauge by pressing the VNAV button (see Figure 5 on page 9)
- Please note, "THR CLB" then appear in cyan color on the PFD, indicating that the VNAV mode is armed and the display speed of the autopilot is set on 250 IAS.
- You can take off TOGA mode or manual push. The VNAV will activated when the aircraft has left the ground and exceeded the speed of 175 kts.
- Please note, "THR CLB" now appears in green on the PFD, indicating that VNAV mode is activated, in HDG mode by default. You can switch to NAV mode (controlled by GPS or radio Nav1) whenever you want.

### CASE 2: In flight:

- The autothrottle (A / THR) must be armed (checked condition)
- The autopilot must be hold on (ALT & SPD modes enabled) (condition not verified)
- The navigation mode (NAV GPS or radio NAV1) activated (condition not verified)
- It is necessary that the new altitude set on the AP is greater than the current altitude of the aircraft (yes!) and that this elevation is at least greater than 2400 feet above ground level (AGL) (checked condition).
- You can activate the gauge by pressing the VNAV button (see Figure 5 on page 9)
- Please note, "THR CLB" now appear in green on the PFD, indicating that VNAV mode is enabled, the navigation mode in which you are at that point (either HDG or NAV mode (via the GPS or via radio Nav1).

Whether during takeoff or upon activation in flight, the VNAV will turn off by itself when the desired altitude is reached, and the autopilot mode automatically toggle in SPEED, NAV and ALT mode.

You can disable at any moment VNAV by pressing the button "VNAV".

In flight, you can bind a bond as many times as you want the VNAV.

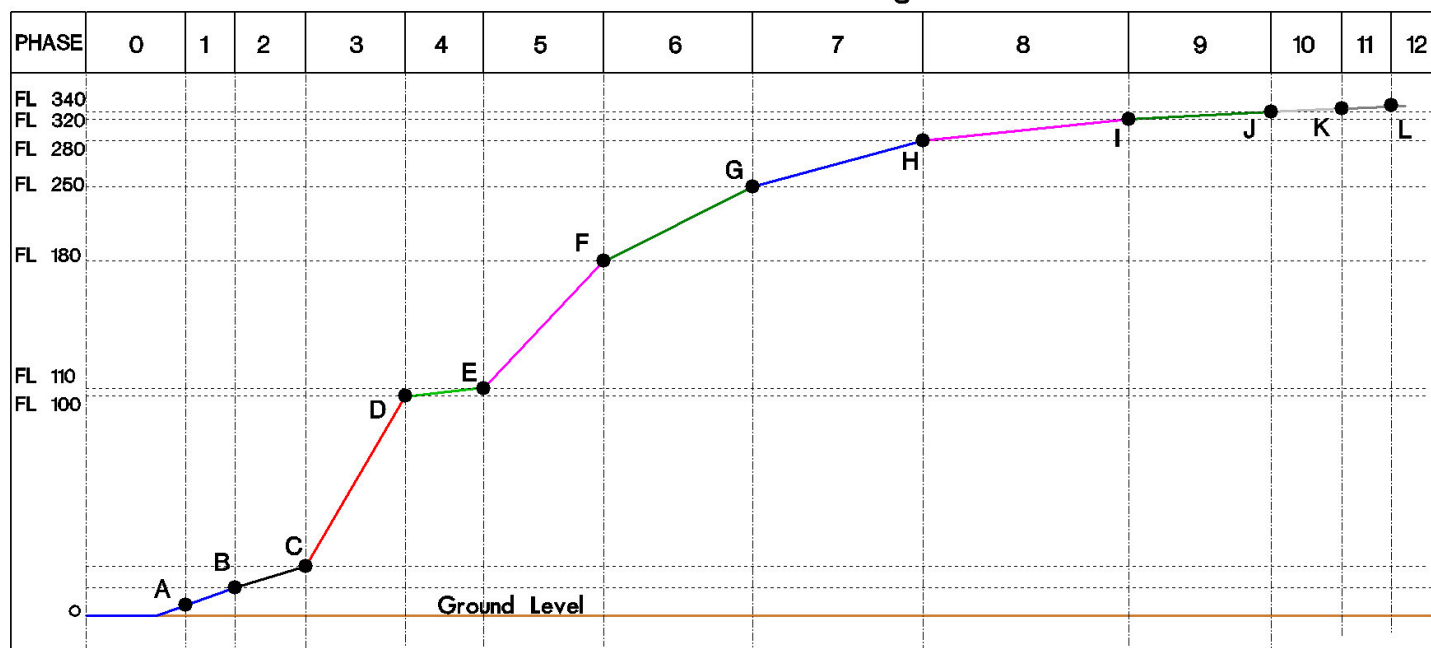
When the rise of the aircraft is under control of the VNAV, you can change the settings of speed, climb rate (VS) and the same altitude as desired, making sure to remain in flight domain.

If you change any of the parameters of flight, be aware that when the aircraft crosses one of the highlights of his rise curve, parameters pre-programmed into the gauge corresponding to this key points will be activated again.

Next page you will find a sketch of explanation of these key points and different phase of rising managed by the VNAV.



## Airbus A319 FD Vnav Gauge



Picture 18

- **Phase 0:** Take off. Point A is the time the plane reached 175kts, causing activation of the VNAV; At this point, the autopilot is on, HDG and ALT mode are activated
- **Phase 1:** From A point to B point, this is the initial acceleration during which the SFCC will automatically flap up. B Point represents the moment when the aircraft reached 230 IAS; TOGA mode is deactivated (if it was) and autopilot engage SPEED mode (preset to 250 IAS). The vertical speed (VS) is set to 2200ft/mn
- **Phase 2:** The vertical velocity is set to a value of 2500ft/mn. C Point represents the moment when the aircraft reaches 240 IAS
- **Phase 3:** The vertical speed is set to a value between 3400ft/mn to 3800ft/mn according to weight of the aircraft. The D point is reached when the aircraft arrives at an altitude of 10000ft.
- **Phase 4:** Second phase of acceleration; The VS is set to 2000ft/mn and speed of the AP is set to 285 IAS. As the airplane exceeds 270 IAS, the speed is again increased to 300 IAS. E Point is when the plane reached an altitude of 11000ft.
- **Phase 5:** VS is set to a value between 2200ft/mn to 3200ft/mn according to weight of the aircraft. F point is the moment when the aircraft reaches FL 180.
- **Phase 6:** The speed of the aircraft is increased to 310 IAS. The VS is set to a value between 1900ft/mn to 2800ft/mn according to the weight of the aircraft. The G point is the time the aircraft reached FL 250, transition altitude; A "ding" sound in the cockpit to warn of the change in speed mode. The display speed of the AP switches MACH exclusive. From this point, the speed of the aircraft will be constantly recalibrated from the altitude to get a true MACH speed if vertical speed is > 0.
- **Phase 7:** The speed of the aircraft is scheduled to Mach 0.74, and VS is set to a value between 1500ft/mn to 2200ft/mn according to aircraft weight. The H point is when the aircraft reaches FL 280.
- **Phase 8:** The speed of the aircraft is scheduled to Mach 0.77, and VS is set to a value between 1200ft/mn to 1800ft/mn according to aircraft weight. The I point is when the aircraft reaches FL 320.
- **Phase 9:** The aircraft speed is set at Mach 0.77, and VS is set to a fixed value of 1100ft/mn. J Point is when the aircraft reaches FL 340.
- **Phase 10:** The speed of the aircraft is scheduled to Mach 0.77, and VS is set to a fixed value of 1000ft/mn. From K point the maximum ceiling allowed for the aircraft is **FL390**.

So the complete curve of VNAV, when activated from the takeoff. But this happens if you turn in flight? It will simply adjust the parameters of the autopilot corresponding to the altitude where you activated the VNAV.

As a concrete example:

You fly to 14 000ft to 280 IAS with autopilot. Want to go up to your cruising altitude of 29 000ft using the VNAV.

You just set the altitude of the AP to 29 000ft and press the VNAV button. The autopilot will then receive the settings for your altitude 14-000ft (so you are in Phase 5), so the speed will be tuned to 300 IAS and VS will be settled at a value between 2300ft/mn to 3200ft/mn according to the weight of your plane at this time. And the climb will continue by executing phases 5, 6, 7 and 8 and your plane will return to "normal" mode at 28 000ft at a speed of Mach 0.77.

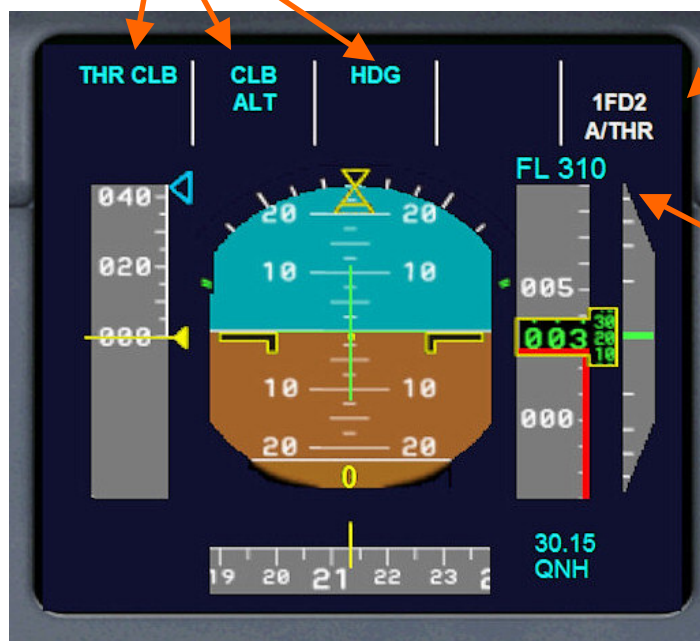
You can enable the VNAV as many times as you like. Simply ensure that when you engage it or you have a speed consistent with your altitude (if you fly too slowly, the VS of the VNAV may be too high and prevent your plane from accelerating, to see his speed drop. In this case, simply decrease the value of VS, the time the aircraft to accelerate.

If you have followed these instructions, the VNAV button should be on green and PFD must show the following informations :

THR CLB | CLB | ALT | HDG indications

In Cyan color, show that the VNAV is armed but not yet active. Activation will be automatically after take off, when the aircraft reaches a safety speed of 175 knots.

Auto Throttle and Flight Director armed.



Picture 19

after takeoff, (generally in TOGA mode) When the aircraft reached 175 knots, the gauge automatically engages the autopilot and indications of the PFD turn green, indicating that the relevant functions are enabled. The climb begins in HDG mode (hence the usefulness of pre-set the HDG to the runway). From that moment, you can switch whenever you want NAV mode (LOC button on Airbus) for the aircraft starts to follow the route of your flight plan. Once the aircraft reaches the speed of 230 knots, TOGA mode will switch to SPEED mode, and the plane started going to climb the curve calculated automatically by the gauge.



Picture 20

At any time of the climb, you have the freedom to modify the values of vertical velocity or aircraft speed, or even to a level (by setting the vertical speed to 0) if instructed by ATC for example.

But know that when the aircraft pass one of the 11 points of the climb curve, it will set the gauge programmed values of VS and speed at this point; But again, you can change these values

You can change their way up the value of the altitude of arrival, by increasing or reducing it. But if you set an altitude value lower than the actual altitude of the aircraft, it considers the gauge has reached the end of the climb and it will deactivate.

You can also disable at any time the gauge by pressing the button VNAV

You can use the VNAV under the ATC control, as climb per level, setting the altitude to the next level given by ATC and activating the VNAV for each of these levels. This method will guarantee an aircraft climb with optimal parameters.

Once at your cruising altitude, the gauge turns off by itself and the cruise continues under the control of the autopilot.

Automatic Vnav climb is finished ; Mach mode is engaged by the gauge.



Picture 21

Think to set baro altimeter to STD (29.92) when above 18 000ft .

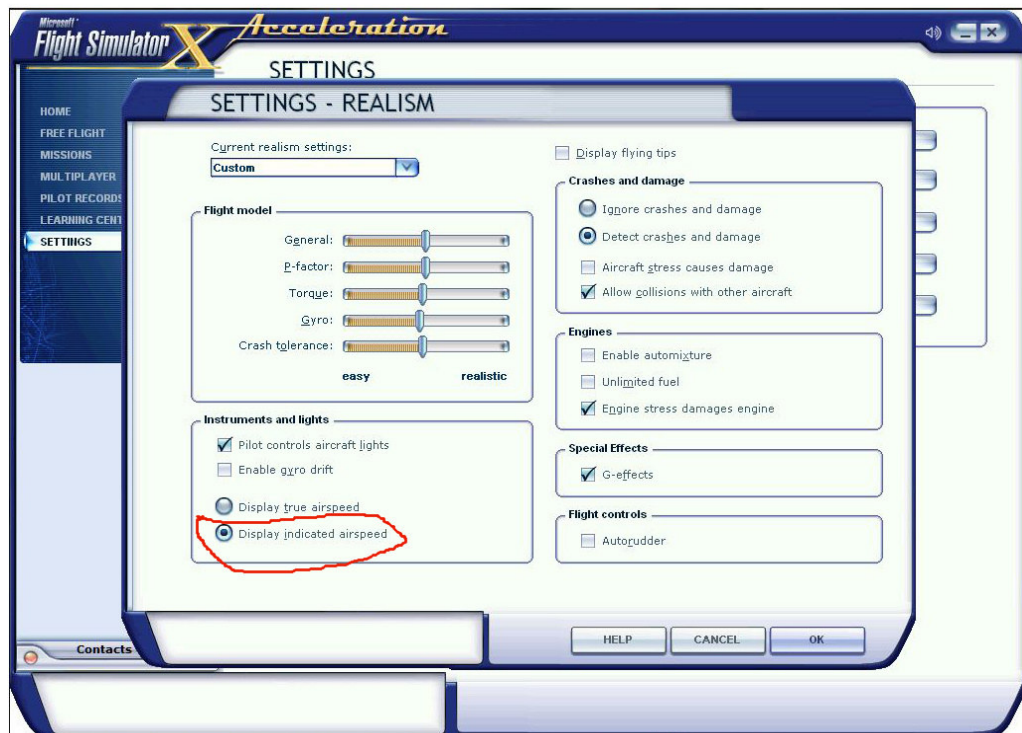
You can set PFD altitude information in feet or FL (if selected altitude is at least 5000ft) by mouse click on it

When the aircraft exceed FL 250, you will hear a « Ding » and the autopilot speed dial will show speed in MACH only. When the aircraft will be again below FL 250, it will show speed in IAS Knots. Below FL 250, you can select IAS or Mach but when aircraft is above FL 250, you will be only in Mach mode.

**Then it is time to address the chapter changes I made to the autopilot.**

## 4.1 New feature of the Autopilot.

**Important ! : You must select in the FSX SETTINGS – REALISM : “Display indicated air speed”**



Picture 22

The stock FSX autopilot appears to me a huge failure. Indeed, even if it displays the Mach speed in AP, the AP takes as reference speed IAS at this setting; The consequence is that we are convinced that the airplane will not exceed the Mach which was display, whereas in reality, if the aircraft climbs, as he remembered the equivalence IAS when setting the Mach, and he uses this value as IAS speed reference, the plane will go faster than the speed indicated in mach and we run the risk of overspeed arrived at high altitude. This is explained (as we know) by the fact that with the rarefied air at high altitude, airspeed IAS indicated by pitot probes is distorted.

I'll take a concrete example:

- At 20 000ft, a speed of 300 IAS is Mach 0.46 whereas 30 000ft, 300 IAS correspond to Mach 0.77
- Also at 20 000ft, Mach 0.77 corresponds to 365 IAS.

The consequence of this is that during the rise, if at 20 000ft, is set on the AP Mach 0.77, when the plane arrives at 30 000ft, You will be in overspeed (as it should reach 365 IAS).

### To summarize, the AP's default FSX does not recalibrate the speed with altitude during climb

To avoid this, I changed the gauge which manages the Autopilot of the plane, so that the speed continuously calibrates itself during the rise, from a certain altitude. I fixed arbitrarily (but not completely at random, do not worry) this altitude, I'll call in an abusive manner, **Transition altitude 25 000 ft.**

Concretely, here is the process during a manually climb or manage by VNAV:

As soon as the aircraft climbs beyond 25-000ft, the display speed of the AP automatically switches MACH; As long as one is above 25 000ft, we can not display the IAS speed on the dial. In order to have a warning at the crosswalks of this transition altitude, a signal will sound at 25 000ft for information.

From this point, the autopilot continuously monitors the actual speed of the aircraft in Mach (the one displayed under ASI of the PFD) not exceeding the speed MACH which was set to the AP dial. If ever this happens, the AP value internally recalibrates IAS versus altitude.

**To summarize, from FL 250, climb is at constant MACH**



So, no risk of overspeed, and the speed will be displayed on the AP will be the true aircraft's Mach speed.

By cons, during descent, as the operation is at the origin, the speed is not recalibrated, because otherwise there would be, there is a risk of overspeed.

During the descent, when the aircraft crosses the transition altitude of 25 000ft, the alarm will sound again, informing the user, and the AP dial will revert to IAS again.

This operating mode is active both during a climb managed manually using the AP, that when using VNAV mode.

These explanations may seem complex at first, but once you have tried the airplane, you will quickly understand the operation and can not do without!

AP speed can be displayed in IAS or MACH under 25 000ft, But only on Mach Above 25 000ft.

## 5 Slats & Flaps Computer controler ( SFCC )

### Foreword

This gauge, originally written by Stefan Liebe, sometimes showed incompatibility problems in some users. I changed the party writing the xml code to correct these bugs.

The SFCC is an automated management system components found on the Airbus.

It provides the following functions:

- · Automatic Retracting of the flaps after take-off (in configuration 1 + F only)
- · When the aircraft is on the ground, position 1 (Slats only) is not selectable, it is in position 1 + F during the first press of the shutter
- · Position 1 (Slats only) is selectable in the air (early approach phase)
- · The fact of flap ensures automatic arming of the spoilers
- · On takeoff, if the flaps are at least one notch (position 1 + F) spoilers will automatically armed after the airplane has exceeded 60 knots, when it quit on takeoff
- · In flight, right out of the first notch of flap, the spoilers are armed automatically
- · On landing when the aircraft slows below 55 knots, spoilers are retracted automatically and disarmed.

**Remember, the possible flaps configuration on the Airbus A320 are as follows:**

### Max speed and flaps & slats configuration

Position	Slats	Flaps	Max Speed	Use for
1	18°	0	230 kts	Approach( only selectable in flight)
1+F	18°	10°	215 kts	Take off and approach
2	22°	15°	200 kts	Short take off and approach
3	22°	20°	185 kts	Approach landing
Full	27°	40°	177 kts	Landing (gear must be extended, otherwise warning)

## 6 Autoflare (Autolanding) and Callout

Stefan Liebe has made a gauge for the Autoflare (autoland ILS) and is completed by the Doug Dawson's gauge of Callout, who gives voice announcement of altitude when descending on the glide / slope.

I had to make many changes to his gauge so it works perfectly with the Project Airbus and I managed to incorporate a touch of flare before the final hit, in order to have landing a little less brutal.

I will not here give all the explanations regarding landing ILS reporter please the many tutorials that are found easily on the net about it.

### The proper functioning of this system to its limits:

- Above all, do not land overloaded (max 66 000kg / 145 505 pounds)
- Respect the reference speed shown on the PFD/ASI (small green circle) see even a little below
- May the wind be stable (no burst or direction change ) **and it is very close of the runway's axis.**

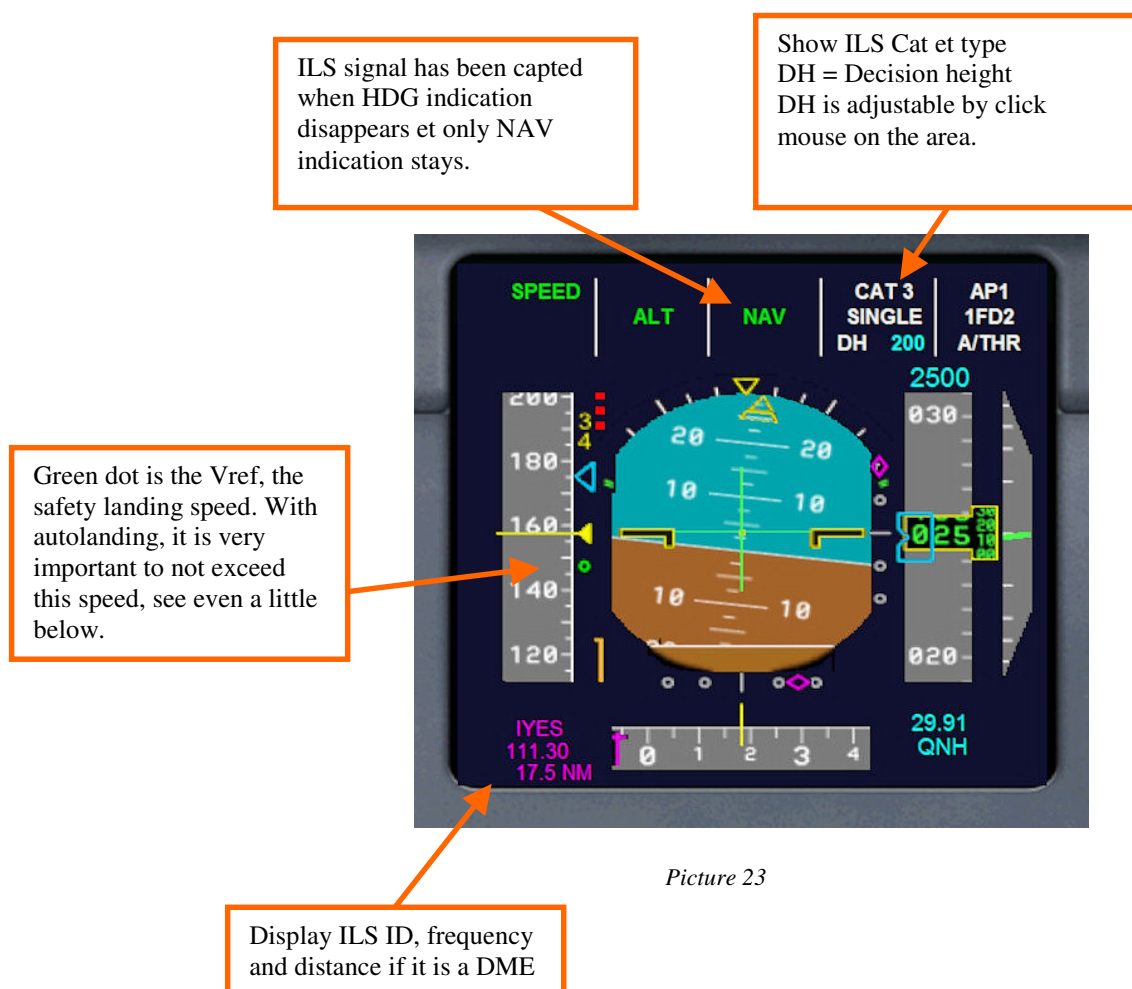
### Overspeed, overload, and crosswind will finish by a crash.

Now, until the last moment, you can change your mind, either by disengaging the autopilot, and by taking commands manually or by engaging the TOGA button to cancel autoland and the plane go around. The latter procedure (the famous Go Around) must be decided before the aircraft either - 200ft of altitude of the runway threshold.

Doug Dawson's Callout system gives voice's announcement of altitude :

2500, 1000, 500 , 200, « minimum » , 100, 50 , 40, 30, 20, 10

« Minimum » announcement is the « Decision Height », an adjustable value (set by default is 200ft), which determines the ultimate point where you can change your mind, and start a Go-Around procedure. By engage TOGA, autopilot cancel autoland and set a positive pitch of 12°, with engines full power.



Picture 23

Landing at Rapid City, LOC has intercepted the GLIDE SLOPE, the plane is about to embark on the glide slope, although it remains to match the pitch on the green mark to Vref. The conditions are excellent for an autoland: The wind is in the line of the runway, and its strength, compensates for the fact that this airport is at high altitude (causing a real landing airspeed important, TAS).



Picture 24

Runway 32 Rapid City is seen, autobrake is set to medium (see next section), the full flaps (which cause the automatic arming of the spoilers) We are on the Glide slope;  
We hear in the Cockpit voice announcement of the various stages of the descent.



Picture 25

When the aircraft is within 50ft of the runway threshold, the autoflare gauge solve the gas at 0 and trim-up the elevators to make the final rounding. On touchdown, the spoilers will come out and automatic braking will be activated and you will only have to engage the "reverses" thinking to cut them as soon as the plane will be less than 60kts.

When the spoilers will disarm itself to 55kts and when the plane will pass under 20kts, the AP will turn off by itself and the it will stop by itself. We are arrived: Perfect landingt !

## 7 Autobrake

Stefan Liebe made functional in its autobrake the Panel. It is controlled via buttons located next to the landing gear lever. There are four positions :

- RTO (Reject Take OFF ) is the higher position but only activable while takeoff.
- Low (Landing)
- Medium (landing)
- High ( same high power bakes as RTO, but only for landing)
- 

**Nota :** RTO and HIGH are activated by the same button. This is the aircraft position which command function (RTO if aircraft is on ground, High if aircraft fly).

A yellow information message appears in the bottom right of primary ECAM to show the activated function (no message if autobrake is OFF) :



Picture 26

If you use FSUIPC, and you have a free axis on your joystick, You can set to this axis the autobrake function. In this case, Values to be programmed are the followings :

- Off = 1
- RTO = 0
- Low = 2
- Med = 3
- High = 4

### RTO Function :

The Autobrake position RTO (Reject Take Off or Quitting off) aborts a takeoff being provided that the aircraft is not already reached V1 speed (Symbolized on the ASI / PFD by a small white one).

To do this, when you are ready for takeoff, we must arm the panel of Autobrake by engaging the right button (MAX). The message autobrake RTO appears in yellow on the bottom right of the ECAM.

Then there are two cases to abort the takeoff procedure, depending on whether one takes off with the controls of gas driven by the auto A / THR) or you manually actuates the gas.

#### A) TakeOff in A/THR mode :

Once the autothrottle armed, you can take off or TOGA mode or with a speed set on the AP and IAS mode. From 60kts, the Spoilers will arm themselves (if you put at least 1+F flap setting ), and from that moment, if you want to give up your intention to take off, you must disarm the autothrottle, and to operate the levers gas 0; this action automatically engage the brakes at maximum power and speed brakes will expand; Generally, it is the moment to engage the reverse thrust to stop as short as possible. The brakes remain engaged until the complete cessation of the aircraft.

#### • B) TakeOff with manual action on the throttle levers :

You push your throttles for the power to take off. Once the aircraft has exceeded 60kts, the spoilers will arm (if you put at least one notch of flaps), and from that moment, if you want to give up your intention to take off, just bring the levers gas 0; This action automatically engage the brakes at maximum power and speed brakes will expand; Generally, it is the moment to engage the reverse thrust to stop as short as possible. The brakes remain engaged until the complete cessation of the aircraft.



## 8 VC Daylighting

FSX has a big flaw with some aircraft in VC mode (Virtual Cockpit). At dawn or late afternoon when the light outside is low, but it is not yet night, the dashboard of the plane can be very dark (especially if you're flying against the light), that renders it unreadable and FSX only allows night mode switching panel ..... that when it gets dark. So during these phases of flight, it is extremely unpleasant to fly or must necessarily pass in 2D Cockpit.

This phenomenon also occurs in the daytime, when using software like "SHADE" which increases the contrast in FSX, and causing this situation even in daylight when flying in against the light.

To remedy this, I create a "day VC lighting." It can illuminate the dashboard under these conditions:

Example image with software "Shade" against sunlight in days:



Picture 27

Like you see, it is very very darker !

....

In the same condition, with my day VC lighting :



picture 28

It's a lilltle better, isn't it !

The VC Daylighting is enabled by default to loading the aircraft. You can disable it via the light button is located on cockpit overhead. 2D popup window that is displayed via the key combination Shift + 5 (the five above the keyboard, not the numeric keypad).

Indeed, the button on the overhead the VC has only two positions while the overhead 2D has a 3 position switch.

This 3 positions are :

- No lighting
- My daylighting
- Default Nightlighting (usable only by night)

As I had to use some tricks to incorporate this light, side effects may occur in certain circumstances, but they all have their solution.

- If the daylighting is active (and it is the default), it is possible that the light starts to flash in the VC when you turn on landing lights: To undo this mess, just order the cockpit light interruptor in the 2D overhead panel and returning. The flashing will stop immediately.
- At night, if you enable lighting of VC via the 'L' key on the keyboard, my daytime running lights will be superimposed on the night lighting, making it the dashboard way too bright; Hence the importance of lighting control since the 3-positions switch of the 2D window of the overhead, which in this case will have three functions: No lighting - lighting such day - night lighting

Default Nighlighting VC.  
You must activate it with  
the 3 positions switch of  
the 2D overhead panel  
(popop window by SHIFT  
+ 5)



Picture 29

If you activate de the  
daylighting of the VC by night,  
it is lke this. (you must  
command it by 2D overhead  
panel)



picture 30

If you activate VC  
nightlighting by « L »  
keypress, My VC daylighting  
comes with the default  
nightlighting. And the  
dashboard become too bright.  
If it happens, toggle the 3  
positions switch on the 2D  
overhead panel ans the problem  
will disappears.



Picture 31

## 9 About Fly By Wire System (FBW)

I activate in the 'aircraft.cfg' file the "Fly By Wire" on this plane, to be in the spirit of the real aircraft. While this feature did not simulate very well with FSX, I preferred to do so to leave everyone free to use or not (since you can enable or disable it from the overhead).

### What is Fly By Wire ?

The flight controls of modern aircraft are now electrical and Airbus introduced a manual steering "guided" by on-board computers. I.e. that there are computers between flight control system (the famous Joystick) and the control surfaces. These computers are supposed to refine the manual control, preventing and prohibiting all orders that could also make out the aircraft's flight envelope, thus endangering the (limiting angles of maneuver that could cause structural stress etc ...).

Unfortunately, having never had the joy of driving a real Airbus, I can not tell you that it is the consequence of real manual control of this function.

The fact is that in FSX, this function has the effect of making the plane "very soft" commands, or even a bit "clumsy" by introducing inertia in the orders given on the control surfaces. This may appeal to certain as it can greatly displeased.

When the FBW is active, some controls become inactive, such as the rudder or trim (controlled by computer). The latter may be set when the plane is grounded, but when he took off, it is the computer that runs it.

Since this system is very particular (and probably hurt by FSX) I chose to put "OFF" by default when you load the plane.

It is during engine start (whether in automatic start by the key combination "CTRL + E" or manual start), I switch the system OFF. You can check its status on the three buttons on the overhead (2D or VC) that the command:

The 3 FBW buttons on OFF position in 2D panel l'overhead



Picture 32

Buttons position in virtual cockpit.



Picture 33

Thus, by default, manual control of the aircraft remains traditional, so as not to surprise the uninitiated.

And if you want to taste the joys of computer-assisted steering, simply to "ON"  
These three buttons (ELAC 1 - SEC 1 - FAC 1).

However, if you interrupt a flight either by saving or returning to the main menu of FSX and you raise a new flight or a flight recorded with the same aircraft, the Fly By Wire will be activated again.

This is due to the fact that FSX does not save variables programming and FBW function if it is enabled in the aircraft.cfg is a feature enabled by default. This is explained by the fact that I disable the function when engine starts, and when you load a current flight engines will already started.

So that the user is not surprised, I included a message that is displayed on the Primary ECAM when FBW is active:



Picture 34

**FLY BY WIRE ON message is shown** if FBW is activated, or if user has activated it manually, or if you have load a saved flight. If you want to disable it, you must press the 3 buttons on overhead (see previous page).

#### NOTA :

The Fly By Wire seems to have no impact when the plane is on autopilot, or during an ILS approach and Autoflare; So state in these phases of flight does not matter.



## 10 Pilots tip Project Airbus A320



### Important :

**For a practical question, I modified the command to the mouse buttons Push-Pull the autopilot (SPD buttons, ALT and HDG) whether in the Virtual Cockpit or 2D in the Cockpit  
To activate or deactivate them, use the right mouse button; settings + or - buttons remain assigned to the left. I found that this solution was more ergonomic and avoided all wrong move.**

The Project Airbus A320 is an aircraft that is controlled very easily. Remember that the airplane is a little slow to pick up speed after takeoff, then retract the landing gear as soon as possible and as long as you have not reached 230/240kts, keep a reasonable angle of climb (no more than 2200 ft / min).

The descent arrival at low altitude, the plane a bit hard to slow down, so do not hesitate to play with speed brakes if necessary.

Most important is to remember that:

- When climbing, the higher one goes, the more we shall slow down vertical
- In fall, the further down, the more we must also reduce its vertical velocity.

example:

- Increase from Take off to FL300, the VS will start approximately 3000ft/mn, while that on reaching FL300, we will 1500ft/mn
- Descent from FL300 to 0, the VS will start at -3000ft/mn to finish at -1500ft/mn

The other most common mistake is to neglect the aircraft weight. There is no point to go with all tanks full to the brim if you make a flight of 500 Nm and arrive at your destination, you will be too heavy for landing. So take care to control and adjust your weight before starting a flight.

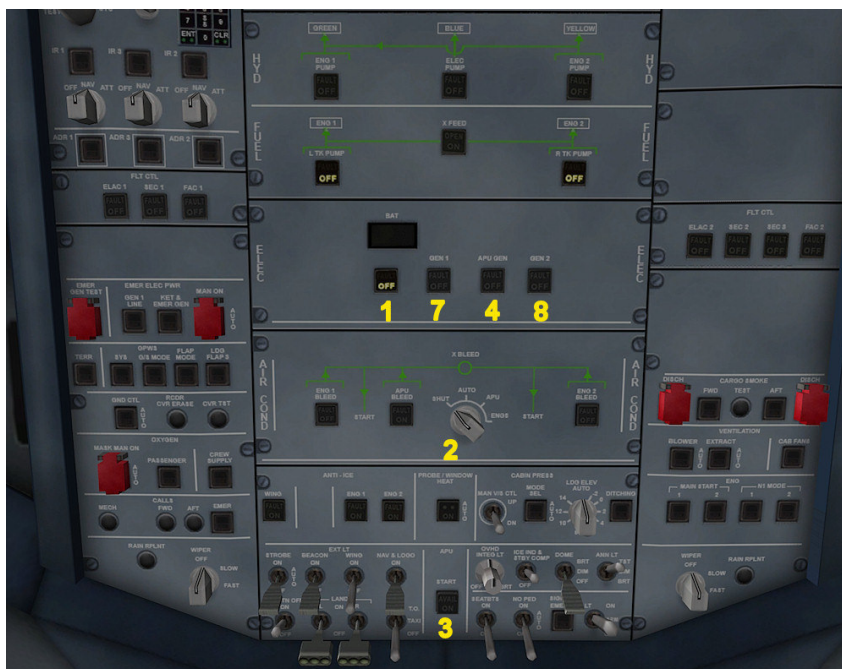
I remind you that the Airbus A320 to a maximum authorized mass landing of 66.000kg (145 505 pounds). Refer to section 10.3 to determine the characteristics of the airplane during flight or check the shelf where you have all these Profiles of informants.

For stunned, a warning message in red, Check Weight appears blinking in the bottom right of the main ECAM in case of overload during takeoff or landing.

## 10.1 Manual engines start-up procedure



Picture 35 2D Pop-up Overhead



Picture 36 – Virtual cockpit Overhead



Picture 37 Cockpit virtual - Pedestal

You can startup engines by use key combination CTRL + E

But if you prefer start manually engines, follow this procedure

- Press Master battery switch (bottom **1**)
- Battery dial show voltage
- Set throttle levers to 0
- Turn rotary knob **2** on APU
- Start APU by pressing button **3**
- Activate APU generator (button **4**)
- Turn APU rotary knob **2** on ENGS
- Toggle starter engine 1 (switch **5**)
- Wait that N1 Engine 1 >17%
- Toggle starter engine 2 (switch **6**)
- Wait that N1 Engine 2 >17%
- Activate engine 1 generator (button **7**)
- Activate engine 2 generator (button **8**)
- Turn APU rotary knob **2** on SHUT
- Shut APU 'switch **3**)

That is, it'll just turn the lights required, and heating systems (wings, engine, pitot) according to the weather.

## 10.2 Flight instructions & procedure

### Takeoff

- Flaps Standard configuration for takeoff : 1+F
- For short take off (very short runway), you can set flaps to 2 or 3
- Trim set to 0 or -0.5
- Autobrake on RTO position
- If you climb in Vnav mode, set runway HDG and final Altitude for cruise
- If manual climb, Set runway HDG, an altitude, et a speed of 250 Kias
- If climb controlled by ATC, Set runway HDG , ATC altitude, and 250 KIAS speed
- Set to armed A/THR
- Turn on the landing lights
- Take off in TOGA mode or by manually controlled throttle levers.
- When the aircraft has reached 100ft, retract landing gear
- If you have activated Vnav, the only thing that you must do is to choose the moment when you toggle HDG mode to NAV mode (LOC button and GPS switch if you follow a gps flight plan)
- Do not exceed 2000ft/mn of vertical speed as the plane has reached 240kts
- With ATC or in manually climb, follow rate of climb of the below data table (if you aren't in VNAV mode)
- Turn off landing lights above 5000ft

### CLIMB: (Do not exceed 10° pitch !)

Altitude	Taux de montée (VS)	Vitesse maxi
0 à 10.000 ft	3000 à 3500 ft/mn	250 KIAS
10.000 à 18.000 ft	2200 à 2500 ft/mn	290 KIAS
18.000 à 25.000 ft	1800 à 2200 ft/mn	310 KIAS
25.000 à 28.000 ft	1500 à 1800 ft/mn	Mach 0.75
Au delà de 28.000 ft	1000 à 1200 ft/mn	Mach 0.77

**Recommended speed in cruise at FL 310/330= Mach 0.80 / Mach 0.77**  
**Maximum ceiling = 39.000 ft**

### Descent :

Altitude	Taux de descente (VS)	Vitesse maxi
39.000 à 25.000	2500 à 3000 ft/mn	Mach 0.75 max
25.000 à 18.000 ft	2500 à 2000 ft/mn	Mach 0.72 max
18.000 à 10.000 ft	1800 ft/mn	280 KIAS
10.000 ft to approach	1500 ft/mn	250 KIAS
Approach to ILS interception	1200 ft/mn maxi	220 KIAS Slats 1 or 1+F

### Landing

- Set ILS frequency on NAV1
- Turn on landing lights
- Flaps 1+F 200 KIAS
- Flaps 2 190 KIAS
- When intercept ILS glide LOC → Landing gear down and set 170 KIAS & flaps 3
- When intercept Glide slope → Flaps Full (4) and set speed to ASI Vref
- Set autobrake
- When touch down, full reverses
- Turn off reverses under 60kts.



### 10.3 Aircraft features & data

#### Version of this package :

- A320-100/200 Airbus Industrie code WV011
- One class cabin configuration – 180 seats
- Version CFM : Engines CFM56-5B4 27,000 livres (120 kN) thrust
- Version IAE : Engines IAE V2527-A5 26,500 livres (117,80 kN) thrust

<b>Masses</b>	<b>Kilogramme</b>	<b>pounds</b>
Empty weight (OEW) CFM engines	41 244	90 927
Empty weight (OEW) IAE engines	41 345	91 150
Maximum taxi weight (MRW)	75 900	167 331
Maximum Takeoff weight (MTOW)	75 500	166 449
Maximum Landing weight (MLW)	66 000	145 505

<b>Dimensions</b>	<b>mètres</b>	<b>Pieds (feet)</b>
Lenght	37.57	123.26
Width	34.10	111.88

<b>Capacités</b>	<b>Litres / Kg</b>	<b>US Gallons / Livres</b>
Maximum Fuel capacity	23 859 litres	6 303 Gallons
Maximum fuel Weight	18 729 kg	41 290 livres
Seats	150 to 180 (180 fot this version A320 high density)	

#### Take off Speeds Flaps 1+F

Masse TO / kg	V1	Vr	V2
75.500	137	155	160
73.500	135	153	156
69.500	130	148	151
66.000	127	145	148
63.500	123	141	144
61.000	121	137	140
58.000	117	135	138
55.000	116	133	136
52.000	116	128	131

#### Take off speeds Flaps 3

Masse TO / kg	V1	Vr	V2
75.500	130	149	155
70.000	125	144	145
66.000	121	140	145
63.500	118	137	142
61.000	115	134	139
58.000	113	130	135
55.000	113	127	132
52.000	113	123	128



**Landing speeds flaps 4 (Full)**

Masse / kg	Vref / Kts
66.000	150
62.500	145
60.000	142
57.000	137
54.000	132
51.000	128
48.000	124
45.000	120

**Maximum operational speeds :**

- Maximum tires landing speed : 195 kts
- Maximum operational speed (VMO) : 350 KIAS
- Maximum retraction landing gear (VLO) : 220 KIAS
- Maximum expand landing gear speed (VLE) : 250 KIAS
- Cruise speed (FL33) : Mach 0.77
- Maximum operational speed : Mach 0,825

**Maximum turbulence penetration :**

- below 20 000 feet : 270 KIAS
- above 20 000 pieds : 300 KIAS

**Stall speed in charge :**

- no flaps : 128 KIAS
- « Full Flaps » configuration : 102 KIAS

**Maximum crosswind for takeoff and landing :**

- For Takeoff and landing : 29 kts
- ILS CAT III Landing : 15 kts
- Maximum gust : 38 kts
- Maximum Tailwind takeoff : 15 kts
- Maximum tailwind landing : 10 kts

Please, see the complete cheklist and reference files, for Kneeboard, realised by Jean-Pierre Varnier

## 13 Troubleshooting

### The speed goes crazy when climbing on autopilot

Either you forgot to activate the heaters pitot tubes (and they are frosted) or the parameters of realism of FSX are misconfigured: see chapter 4.1.

### When I activate the landing lights, cockpit lighting flashes.

It may be that this bug is present on certain configuration; Unfortunately I have not found yet the solution to prevent it from happening, but it is easy to solve:

If the lighting of the dashboard will flash, then open the popup window of Overhead 2D (SHIFT + 5), and operate the 3-position switch that controls the lighting cockpit to cut lighting in initially and returned immediately. The flash will be gone. (See Chapter 8 page 25).

### At night, the lighting of the dashboard of virtual cockpit is much too bright.

Is that you operate the lighting of the dashboard by pressing the "L" key, so there is accumulation of nighttime lighting and my custom daylighting.

Simply open the 2D Overhead the popup window (SHIFT + 5), and activate the 3-position switch that controls the lighting cockpit to restore the desired lighting. (See Chapter 8 page 26).

### VNAV mode will not be armed.

Forgot one step necessary for its implementation (adjustment of altitude or A/THR arm ...)  
(See Chapter 4, page 14).

### After takeoff, the flaps do not want to retract all alone.

You have a rate of climb (vertical speed) inappropriate: It is either too low or it is too excessive.

The SFCC retract orders under conditions that the aircraft is between 200 and 2000ft feet above ground level (AGL), its speed at this time is at least 200kts and 210kts maximum, and that the rate of climb (VS) is at least 500ft/mn.

### The speedometer of the PFD goes to 0 in flight.

The pitot tubes are frosted; You forgot to activate the heating of pitot tubes. The control is mounted on the overhead. The speed is not recalibrated uphill beyond FL 250.

You fly too slowly; the autopilot controls the speed beyond that of 25 000ft above it is greater than M 0,65: Increase your speed.

### The plane is landing next to the runway during a Autolanding (Autoflare).

There were probably too crosswind component. The autolanding can only work if the wind is very close to the axis of the runway (less than 15 ° deviation)

### The aircraft crashed during a Autolanding (Autoflare).

Several possible reasons: either you pass the maximum allowed mass for landing (62 500kg) or your landing speed was too high (you have not respected the Vref symbolize by the green circle on the tape speed of the PFD ).

### The FLY BY WIRE has activated itself without action on my part.

If you save a flight or if you return to the main FSX menu, when reloading the flight, the FBW will be active for it is its normal state by default. I disable it when the engine start, so as you take a flight in progress, the engines have already started. So the FBW can be cut automatically. That's why I added, an informative message on the ECAM that warns of this. But you can disable at any time by pressing the FBW buttons concerned (see Chapter 9, page 27).

### I cannot start engines or all displays are turn off.

If you have activated the battery switch, all avionics use power, so if you haven't start immediately APU or a Engine and don't set generator, voltage of the battery will be to low; Under 17 volts, System don't work; you must start APU and set APU generator to restore the battery.

### My virtual cockpit is black (no texture) when I have installed a new Texture.

Missing file "Texture.cfg" in your new texture folder. This file points to the "Texture" folder which contain the VC's texture. You can copy the "texture.cfg" file that you will find in one of the texture.xxx come with my aircraft pack, and paste it in your new texture folder

**Nota : When you load a saved flight, my programmed variables are not saved by FSX, so Vnav activation, fly by wire status are not saved ; Be carreful to verify and check these values when you load a flight.**

# Good flight !!