



**Brussels Flight Simulators**  
**B737-800 NG Initial Briefing Kit**  
Version 1.3 December 2021

**How To Fly a Boeing 737**  
**:: QUICK & EASY BASICS ::**



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# Foreword

This document was not designed to be at Flight Manual nor an Operating Manual. It's only a basic global approach dedicated to non-pilot people who wants to enjoy our B737NG simulator with a minimum of understanding of what they will do – and will fly.

It is provided “as is” with a lot of uncovered matters and topics, which are far out of the scope of this document. Just consider it as an initial “briefing kit”.

## ***For our Fun Flight Pilots:***

**It's absolutely not mandatory to read this doc or to study anything before your fun flight experience, it's up to you to decide if you feel it interesting or not. In any case, you will get a quick briefing before your flight, where the most important things will be explained. If you have any question about the content of this document (or other related questions), feel free to question your instructor during the initial briefing.**

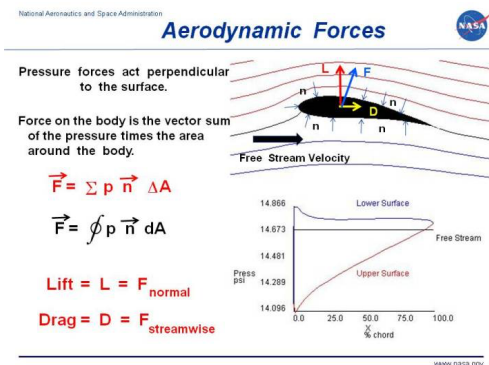
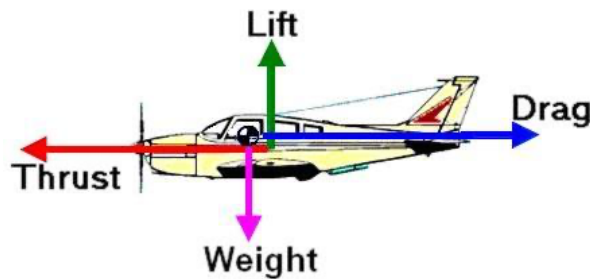
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## 1) The 4 Forces

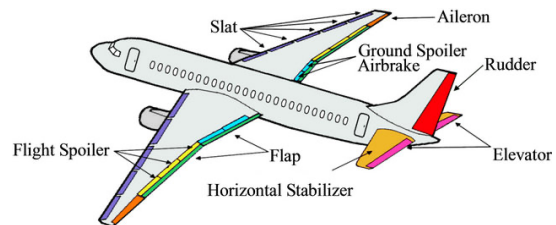
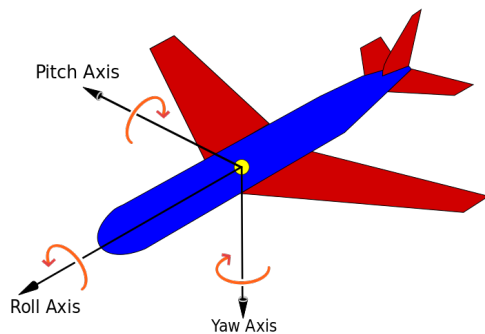
We can simplify the forces and consider that all aircraft are subjected to 4 basic forces:



| Force                                                                                                                                                                 | Depending on                                                                                                                                                                                                                                                                                                                        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Weight</b> <ul style="list-style-type: none"> <li>Acts Downward</li> <li>Is Always Vertical</li> </ul>                                                             | <ul style="list-style-type: none"> <li>Aircraft Empty Weight ..... 41.4 T</li> <li>Crew + Pax + Cargo ..... max 21.3 T</li> <li>Fuel On Board ..... max 21.0 T</li> <li>! B738NG max T/O weight 79.0 T</li> <li>! B738NG max L/D weight 66.3 T</li> </ul>                                                                           |
| <b>Lift (Aerodynamic component)</b> <ul style="list-style-type: none"> <li>Acts Upward (in normal situation)</li> <li>Perpendicular to the Aircraft Motion</li> </ul> | <ul style="list-style-type: none"> <li>Surface of the Wings</li> <li>Air Density</li> <li>Air Velocity (square of)</li> <li>Angle of Attack</li> </ul> <p>Angle of Attack has a max limit which is called the "<b>Stall Angle</b>".</p>                                                                                             |
| <b>Thrust (moves aircraft through the air)</b> <ul style="list-style-type: none"> <li>Acts Forward</li> <li>Parallel to the Aircraft Motion</li> </ul>                | <ul style="list-style-type: none"> <li>Mass of Air Flow Rate</li> <li>Turbine Rotation Rate</li> <li>Propeller RPM</li> <li>Propeller Pitch (if variable)</li> <li>...</li> </ul>                                                                                                                                                   |
| <b>Drag (Aerodynamic component)</b> <ul style="list-style-type: none"> <li>Acts Backward</li> <li>Parallel to the Aircraft Motion</li> </ul>                          | <ul style="list-style-type: none"> <li>Size &amp; Shape of Body and Wings</li> <li>Air Density</li> <li>Air Velocity (square of)</li> <li>Body Angle in the Air Flow</li> </ul> <p>NOTE: Drag &amp; Lift are 2 components of the aerodynamic forces acting on an aircraft, so they are always linked:<br/>more lift = more drag</p> |

## 2) Primary Flight Controls & Related Surfaces

Aircrafts are to be controlled on 3 Axis: **Pitch**, **Roll** and **Yaw**. This is done by the **Elevator**, the **Ailerons** and the **Rudder**.

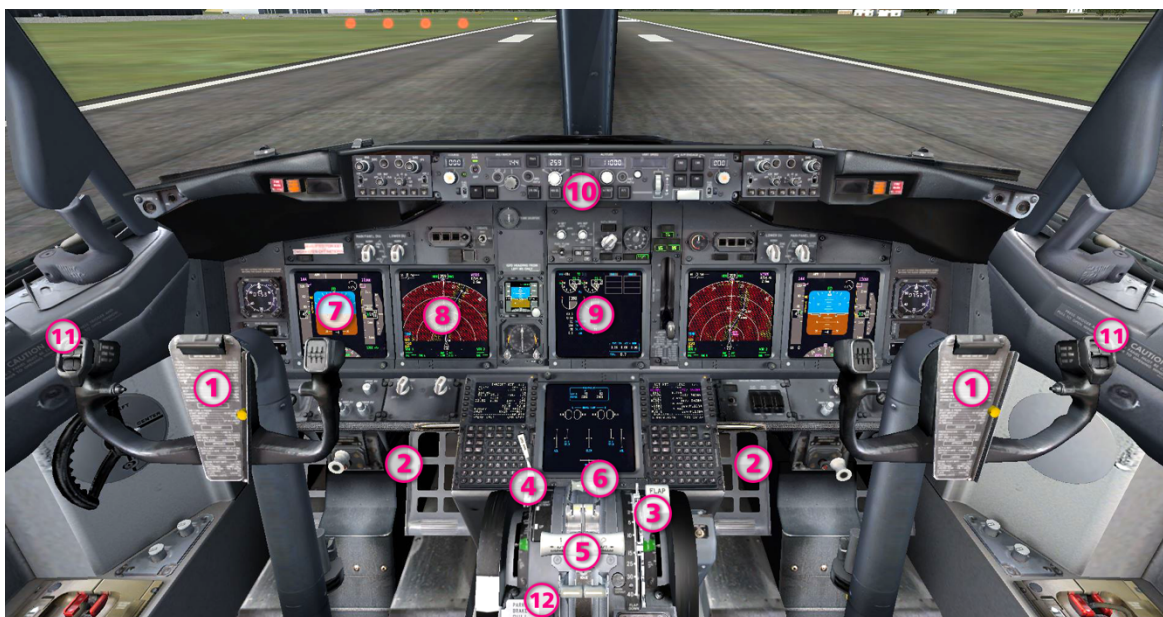


| <i>Axis</i>                                                                                         | <i>Surface</i>  | <i>Controlled by</i>                                                                                               |
|-----------------------------------------------------------------------------------------------------|-----------------|--------------------------------------------------------------------------------------------------------------------|
| <b>Pitch</b> <ul style="list-style-type: none"><li>Lateral Axis =&gt; "Nose Up or Down"</li></ul>   | <b>Elevator</b> | <b>Yokes ①</b> <ul style="list-style-type: none"><li>Backward = Pitch Up</li><li>Forward = Pitch Down</li></ul>    |
| <b>Roll</b> <ul style="list-style-type: none"><li>Longitudinal Axis =&gt; "Bank angle"</li></ul>    | <b>Ailerons</b> | <b>Yokes ①</b> <ul style="list-style-type: none"><li>Left = Roll Left</li><li>Right = Roll Right</li></ul>         |
| <b>Yaw</b> <ul style="list-style-type: none"><li>Vertical Axis =&gt; "Nose Left or Right"</li></ul> | <b>Rudder</b>   | <b>Rudder Pedals ②</b> <ul style="list-style-type: none"><li>Left = Nose Left</li><li>Right = Nose Right</li></ul> |

## 3) Secondary Flight Controls & Related Surfaces

Secondary Flight Controls contribute to assist Primary Flight Controls, increase Lift, brake the Aircraft, etc. See picture above.

| <i>Device</i>                                                                                                                                                                                                    | <i>Controlled by</i>                                                                                                                                                                                                                                                            |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Flaps / Slats</b> <ul style="list-style-type: none"><li>Mobile parts on the edges of the wings used to increase the Lift and reduce the body angle of the aircraft at low speed</li></ul>                     | <b>Flap Lever ③</b> <ul style="list-style-type: none"><li>Set from 0° to 40°<br/><i>NOTE: frequently set to 5° on T/O and to 30° on Landing</i></li></ul>                                                                                                                       |
| <b>Spoilers / Speed Brakes</b> <ul style="list-style-type: none"><li>Located on the upper surface of the wings, they are used to brake, help the turns and destroy Lift if needed (fast descent, etc.)</li></ul> | <b>Speedbrake Lever ④</b> <ul style="list-style-type: none"><li>Full Forward is Down (no spoilers)</li><li>Armed = Ready to Deploy</li><li>Max Flight Detent = All Flight Spoilers up (Ground Spoilers down)</li><li>Full = All fully up (full braking on the Ground)</li></ul> |



(see this picture in full page at the end of the document – page 15)

#### 4) Other Controls and Displays

| Device                                                                                                                                                                                                                                                                                                                   | Controlled by                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Engines</b> <ul style="list-style-type: none"> <li>Boeing 737NG's use 2 CFM56-7B which vary from 20k to 27k lbs of thrust each (9 to 12 tons), depending on the model of the aircraft.</li> </ul>                                                                                                                     | <b>Thrust Levers ⑤</b> <ul style="list-style-type: none"> <li>Thrust is mainly monitored by N1 indicators (check top left of the upper EICAS ⑨); N1 is the rotational speed of the low-pressure spool of the engine (the big fan that you can see at the entry of the reactors).</li> </ul> <p>It is indicated in % where 100% is around 5200 RPM<br/> <i>NOTE: for T/O set 40% of N1 then press TOGA when stable</i></p>                                                                                                                              |
| <b>Thrust Reversers</b> <ul style="list-style-type: none"> <li>Thrust reversal is the temporary diversion of an aircraft engine's thrust so that it is directed forward, rather than backward, thus providing efficient deceleration just after touch-down. Not allowed in all airports because of the noise.</li> </ul> | <b>Reverse Thrust Levers ⑥</b> <ul style="list-style-type: none"> <li>Pull them up after touch-down to slow down the aircraft, if allowed;</li> <li>Maintain reverse as required, up to the maximum, until airspeed approaches 60 knots;</li> <li>The thrust levers should be positioned to reverse idle by taxi speed, then full down after the engines have decelerated to idle.</li> </ul>                                                                                                                                                          |
| <b>Stabilizer Trim</b> <ul style="list-style-type: none"> <li>The Stab Trim controls the position of the horizontal stabilizer. It can be positioned by the Stab Trim Switches (see beside), the Stab Trim Wheels or the Auto-Pilot.</li> </ul>                                                                          | <b>Stab Trim switches ⑪</b> <ul style="list-style-type: none"> <li>These switches, located at the top left of the yoke for the captain (top right for the FO), are usually used to keep a neutral position of the stick in all circumstances. Switches <b>downward</b> means aircraft "nose <b>up</b>" while <b>upward</b> is nose <b>down</b>!</li> <li>Do not control the pitch with the Stab Trim. Control the pitch with the stick/yoke, then use the trim to release the force on the control column and find back a neutral position.</li> </ul> |
| <b>Parking Brake</b>                                                                                                                                                                                                                                                                                                     | <b>Parking Brake lever ⑫</b> <ul style="list-style-type: none"> <li>A Red light means that the Parking Brake is set. It will switch off if you brake manually with the feet.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                |

| <i>Display</i>                                                                                                                                                            | <i>Displaying</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Primary Flight Display (PFD) 7</b> <ul style="list-style-type: none"> <li>There is a PFD for each pilot, on the outboard side of the main instrument panel.</li> </ul> | <b>Attitude, Airspeed, Altitude, Heading, etc.</b> <ul style="list-style-type: none"> <li>The Artificial Horizon shows in the center of the screen, indicating the aircraft attitude;</li> <li>Read later about the Flight Director;</li> <li>The Airspeed is indicated on the left tape, along with other significant speed bugs (V1, VR, Flaps speeds, VRef, Stall, etc.);</li> <li>The Altitude is shown on the right tape, where you can also check QNH and minimums;</li> <li>Heading appears at the bottom of the screen</li> </ul> |
| <b>Navigation Display (ND) 8</b> <ul style="list-style-type: none"> <li>Each pilot has his ND.</li> </ul>                                                                 | <b>Route, Vertical path, Heading, Stations, Terrain, Traffic, Weather, VOR, ILS, etc.</b> <ul style="list-style-type: none"> <li>These displays are used to show everything about the aircraft environment and navigation;</li> </ul>                                                                                                                                                                                                                                                                                                     |
| <b>EICAS 9</b> <ul style="list-style-type: none"> <li>There are 2 EICAS located in the center of the Main Instrument Panel (MIP): the upper and the lower.</li> </ul>     | <b>Engine Indicating and Crew Alerting System</b> <ul style="list-style-type: none"> <li>The upper EICAS will mainly show Engine indications while the lower will show a part of them or other system indications;</li> <li>The most important parameter shown here - because we just focus on the very basics - is “N1”. N1 is the rotational speed of the low-pressure spool of the engine (the big fan that you can see at the entry of the reactors). It is indicated in % where 100% is around 5200 RPM;</li> </ul>                  |

## 5) MCP (Mode Control Panel) 10



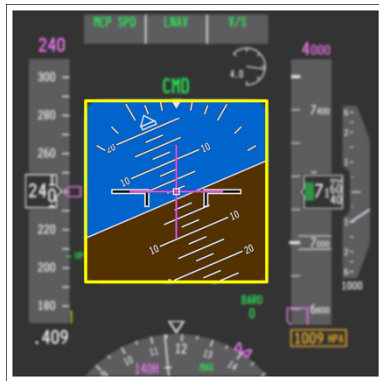
The **Mode Control Panel** is so called because it contains controls that allow the crew of the aircraft to select which parts of the aircraft's flight are to be controlled automatically.

The **MCP** can be used to instruct the autopilot to hold a specific altitude, to change altitudes at a specific rate, to hold a specific heading, to turn to a new heading, to follow the directions of the flight management computer (FMC), and so on. The **MCP** is actually independent of the autopilot—it simply sets the mode in which the autopilot operates, but the autopilot itself (AFDS) is a separate aircraft system. The **MCP** interacts with both the autopilot and FMC(s).

Even if we fly manually, for our basic flights we will encode there the **3 main parameters** which are **SPEED**, **HEADING** and **ALTITUDE**, as it will dictate the Flight Director what to indicate (see next chapter).

## 6) The PFD ⑦ : EVERYTHING YOU NEED TO FLY THE AIRCRAFT!

### • The center part of the PFD is the Artificial Horizon



It represents the Earth in brown and the Sky in blue, and allow the pilots to exactly know the attitude (Pitch and Roll) of the plane, even with no visibility at all.

The symbol  in the middle represents the aircraft. Don't look at the **magenta cross** for the moment, we'll explain this later (see chapter 7).

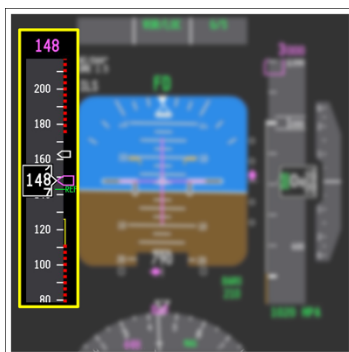
The **vertical graduation** indicates the **PITCH** of the plane, in degrees (step of 2,5°). The current pitch is shown by the little square in the center of the screen (see the symbol above); just think that this square is the nose of the plane.

Here follow some examples of pitch (will vary depending on weight & performances) :

- 15° with 90% N1 at the takeoff;
- 10° with 85% N1 in climb / acceleration;
- 5° with 60% N1 in level flight at about 220 KT;
- 2,5° with idle thrust in descent, flaps up, 1000 fpm / 220 KT;
- 2° in final with landing gear down, flaps 30, 58% N1;

The **graduation in the form of an arc of a circle** at the top of the screen makes it possible to read the **ROLL**, the inclination of the aircraft, marking first 10°, 20° and 30° (30° being normally the maximum bank angle with passengers and for normal operations); further, it also shows 45° and 60°, where one should **normally** never fly if you do not plan a steep turn. Be aware that a cockpit warning sound will alert the crew with a loud "**Bank Angle!**" as soon as the bank angle is at or above 33°.

### • The left tape shows the Air Speed



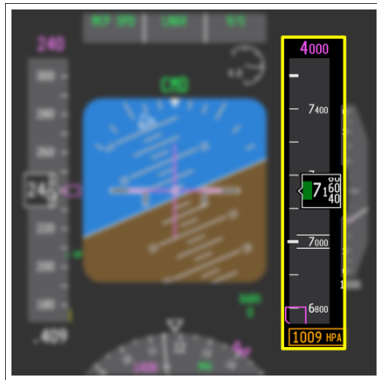
Air Speed is indicated in **KNOTS** (KT); knots are Nautical Miles per hour (1 KT = 1,852 km/h).

This is the "aerodynamic speed" of the air around the aircraft, not the ground speed! And it is even neither the true air speed, but this is beyond what we can explain here. Let's call it "**IAS**" for Indicated Air Speed.

The current IAS has to be read in the black box (**148** here).

There are a lot of bugs and indicators in this tape, changing in relation to the current phase or configuration of the flight. Here we can see that the **REF** speed (reference speed for landing) points to 143; a white bug points to 163 which is REF speed+20; overspeed and stall speed are in **red zones**, while the Minimum Maneuvering Speed range is the **yellow zone**. The magenta **148** at the top of the tape show the MCP selected speed.

- **The right tape shows the Altitude**



The Altitude is indicated in **FEET** (ft) from **Mean Sea Level** (MSL). 1ft = 30 cm.

The magenta **4000** at the top of the tape is the MCP selected altitude (target).

The example shows a plane flying at 7150 ft, descending to 4000 ft..

**1009 HPA** is the current atmospheric pressure, which is needed to display a correct altitude. It is currently displayed in **yellow** because we fly above the transition level, but this is another story...

- **Heading at the bottom**



This shows the **Heading** in **DEGREES** from the **MAGNETIC NORTH** (the North shown on a compass is not True North).

**MAG** indicates that we read (here) a **MAG**netic compass.

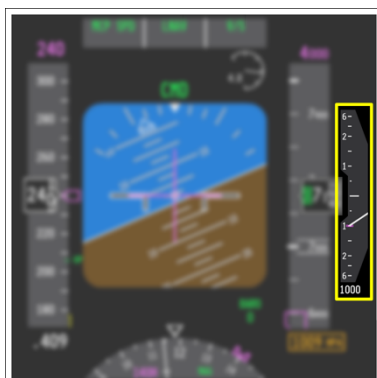
*If you remember your good old compass:*

- North is 0° (or 360°, it's the same)
- East is 90°
- South is 180°
- West is 270°

The (target) **Heading** that is selected via the MCP is displayed as a magenta number (**140H** here) and a **magenta bug**.

The **white arrow** shows the direction of the "**head**" while the **white track line** shows the route that is really flown. The **Route (track)** is generally (very) different of the **Heading** because of the drift induced by the wind.

- **The Vertical Speed Indicator**



The right edge indicates the **Vertical Speed** of the aircraft, in **FEET/MINUTE** (1000 ft/min = 5 m/s = 18 km/h). Each number represents thousands of fpm.

In this example, the VS is -1000 (= descent of 1000 ft per minute).

If the aircraft would be climbing, a positive value would be displayed above the indicator.

For example, a standard final descent on a 3° glide path should indicate something around 700/800 feet per minute. The flare executed just before touching the runway should be made to lower the VS at or below 400.

## 7) The Flight Director and its magic Magenta Cross!

There are very sophisticated systems and computers on board, calculating in real time the best attitude, thrust and behavior that the aircraft should have at any moment.

The results of these calculations are displayed in different ways for the crew.

The **Magenta Cross** appearing in the Artificial Horizon of the PFD is one of them and is a very helpful device, particularly for young inexperienced “fun-pilots” like you! ;)

This Magenta Cross is called the **Flight Director (FD)** (in short). As a cross is obviously compounded by 2 lines, let’s explain each of them.



- **The Horizontal Line is a “Pitch Advice”**

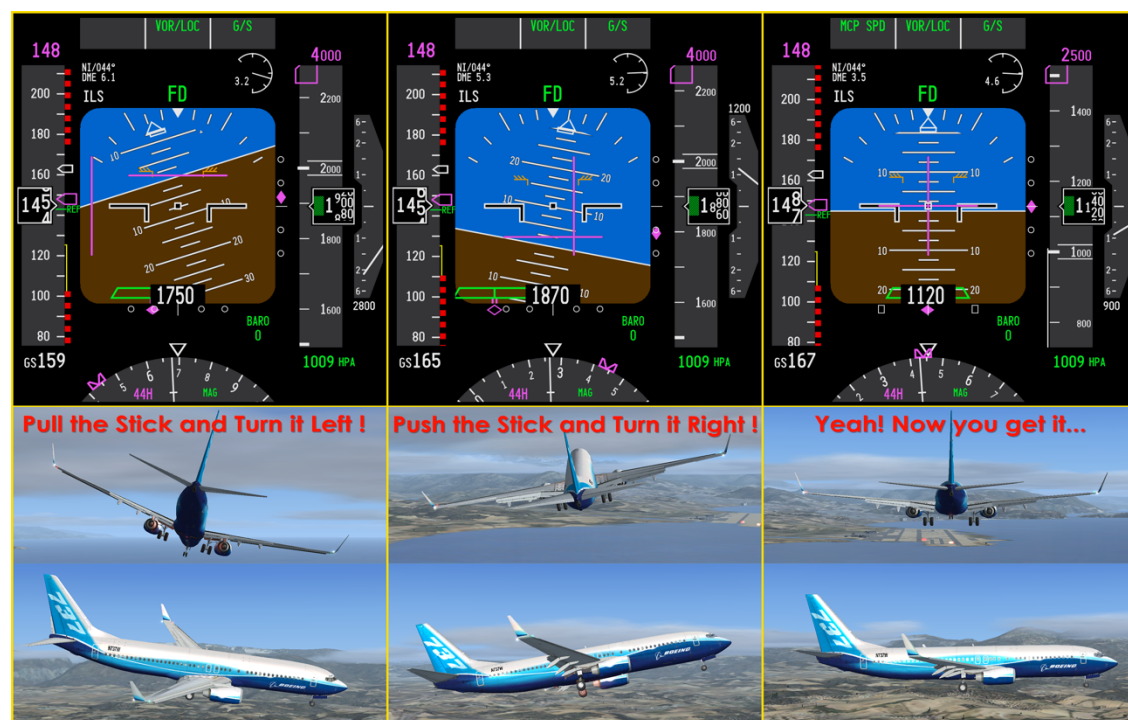
If you set the nose of the plane on this horizontal line, you will fly a correct pitch for what is asked to the plane (mainly coming from the **MCP** and the Flight Management System).

Is the horizontal line **above** the nose of the plane? **Pull** the stick until you reach it! And **anticipate** the moment where you’ll reach it, to avoid an “overshoot” !

- **The Vertical Line is a “Roll Advice”**

If you set the nose of the plane on this vertical line, you will have a correct roll attitude for what is asked to the plane (mainly coming from **MCP** and the Flight Management System).

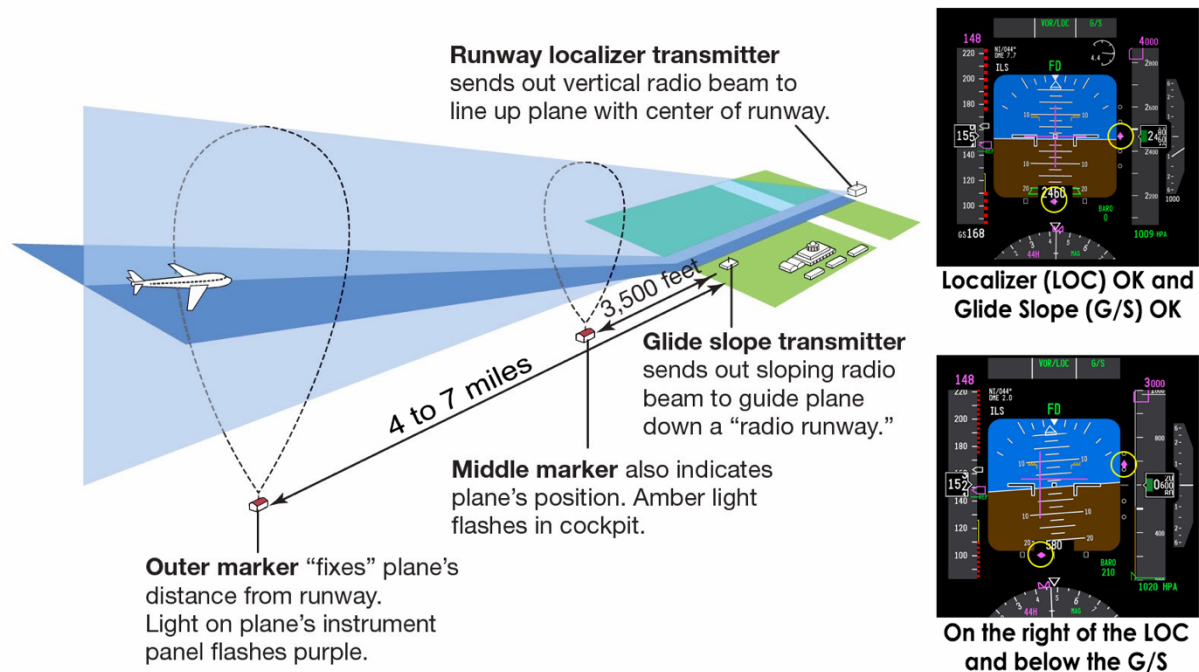
Is the vertical line is on the **left**? turn the yoke **leftward**; is it on the **right**? turn it **rightward**!



## 8) ILS: Instrument Landing System

Landing is not a piece of cake! **ILS** (stands for “Instrument Landing System”) is a useful **radionavigation** system providing aircraft with full **guidance** during final approach. It is called a **Precision Approach** because it gives both **lateral** and **vertical** guidance.

The **ILS** system is actually compounded by 2 different guidance sub-systems: the **LOCALIZER** and the **GLIDESLOPE**. These are 2 plans in a cone of precision.



- **The LOCALIZER is a vertical plan providing lateral guidance**

The **localizer** transmitter is generally located at the end of the runway and centered on the runway axis. It “says” to the aircraft if it is correctly lined up, or too much on the right or left.

The **localizer** helps the (auto)pilot to correctly line up the aircraft, but doesn't care about the altitude: the aircraft can show a perfect lateral alignment even if it flies way too high or too low! The localizer is symbolized by a **magenta dot** at the bottom of the Artificial Horizon, so the pilot knows its position with respect of the **LOC** (centered, right or left).

- **The GLIDESLOPE is an inclined plan providing vertical guidance**

The **glideslope** antenna normally sits around the 1000 ft touchdown zone markers on the runway, offset a little bit from the runway. It broadcasts two lobes centered around a 3° slope (this may vary by installation). The **glideslope** is generally usable about 10 nm from the runway, but not often used that far out.

The **glideslope** helps the (auto)pilot to manage a correct descent rate, by showing the vertical position of the aircraft relative to the glide plan: check the **magenta dot** at the right edge of the Artificial Horizon.

- **Localizer + Glideslope = invisible wire**

If we merge the two virtual plans explained above (**localizer** and **glideslope**), we find an intersection just like an **invisible wire**, stretched from the sky to the runway threshold with a (generally) 3° slope and aligned with the runway centerline.

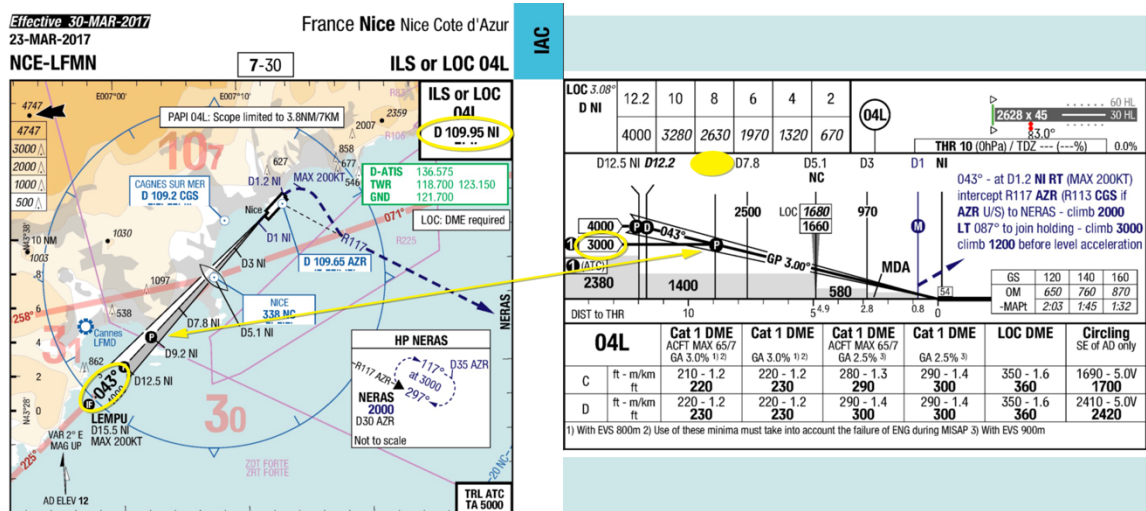
Once the radios are set, and if the aircraft is close enough (and inside the *cone* of the radio signal), the **ILS** will be “captured” by the aircraft systems, which will provide the pilots with **the 2 magenta dots** ♦ showing the position of the plane relative to this **invisible wire**.

The aircraft just has to intercept this **invisible wire**, and then follow it. How? There comes the **Magenta Cross** back, which shows to the pilot the best way to intercept and keep it!

- **ILS chart example**

Here is an ILS chart of Nice runway 04 left (© Lido). We will not explain all the things on this chart, but just a few main things:

- **Main Radio Frequency** to be tuned in your navigation radio(s): **109.95 MHz**
- **Final Course** (direction towards the runway): **43°**
- **Glide Path** of **3°** => can be intercepted at **3000 ft** at **9.2 miles** from runway threshold



This chart is to be used if you are asked by ATC (Air Traffic Control) to land on runway 04L with the ILS procedure. ATC will probably give you “vectors” (i.e. headings, speeds and altitudes) to make you intercept the ILS approach at 12/15 nm from the runway threshold.

## 9) The Navigation Radios (NAV)

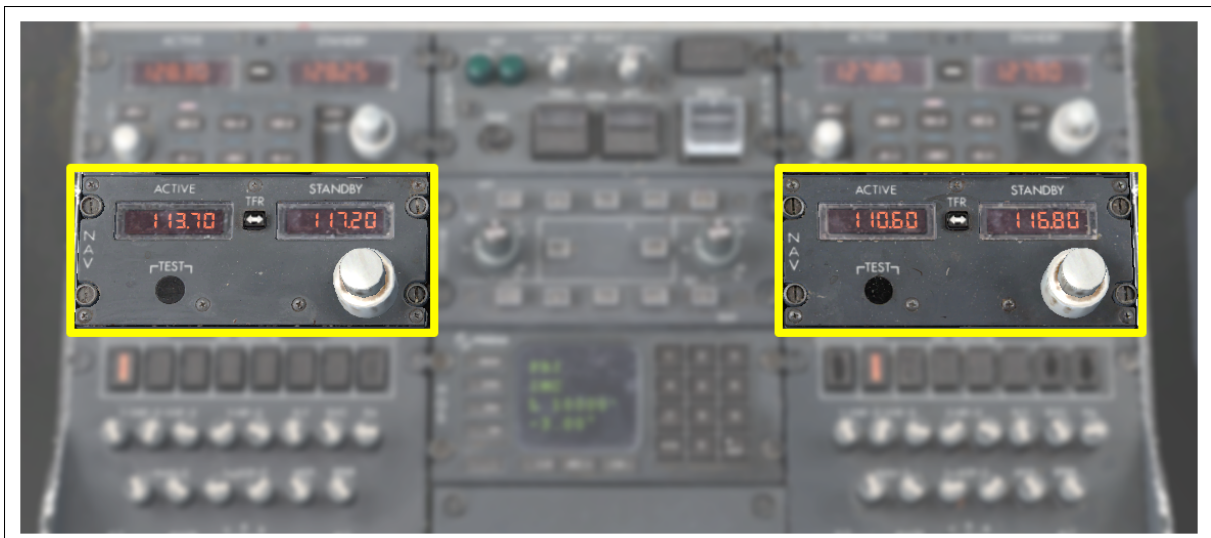
The two **NAV** radios are located between the 2 pilot seats, in the center pedestal, among other radios and devices: one radio for each pilot, for its own (independent) systems.

We will not explain what are these other devices, just a quick list of what we can find there:

- Communication Radios (COM)
- Navigation Radios (NAV)
- ADF Radio(s)
- Transponder
- Audio Panel
- Cargo Fire Panel
- Ailerons and Rudder Trims
- Cockpit Door lock
- Etc.



Let's zoom to the NAV Radio devices:



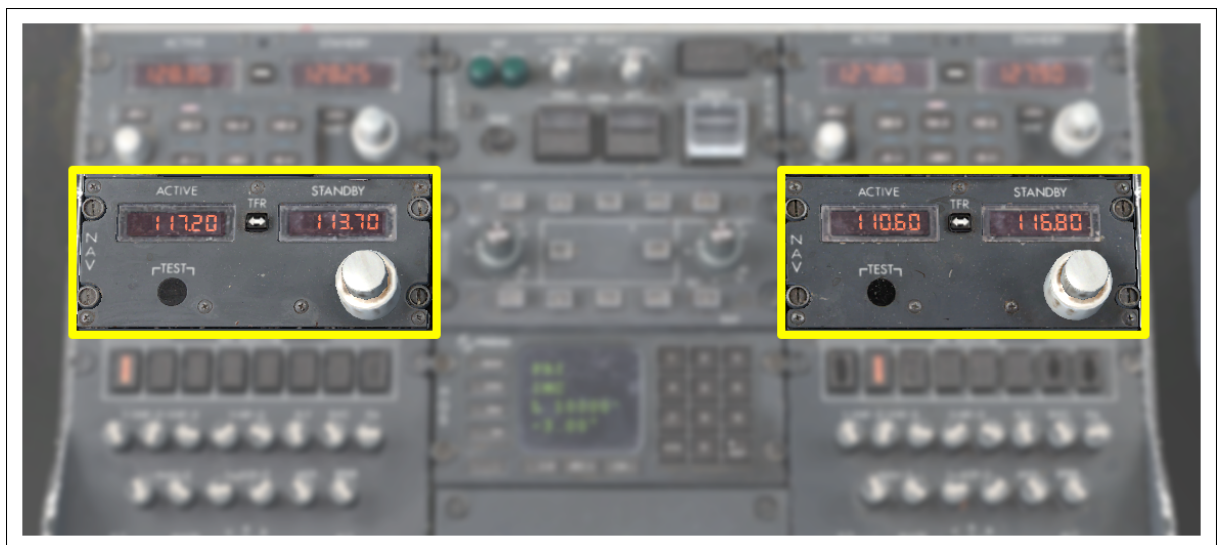
As we can see, each NAV radio has 2 display boxes: an **ACTIVE** and a **STANDBY** one. There is also a switch between these 2 boxes, which is labelled “**TFR**” for “**Transfer**”.

To tune a radio frequency, we just have to turn the double knob at the bottom right of the device. The large outside knob will set the units of the frequency, and the upper inside knob will set the decimals. The settings will show in the STANDBY box.

If we press on TFR, the **ACTIVE** and **STANDBY** frequency will be swapped.

For example, on the NAV 1 radio that stands on the left side (see previous picture), we can see that 113.70 MHz is currently active, while 117.20 MHz is in standby. 117.20 is the latest frequency that we have set with the double knob.

If we press now on TFR, the active frequency will become 117.20 and the standby will 113.70. See below. Easy, isn't it?



The **ACTIVE** frequency is the one that the navigation systems will use for the displays and guidance. The **ILS** frequency that we explained in the previous chapter must be set there.

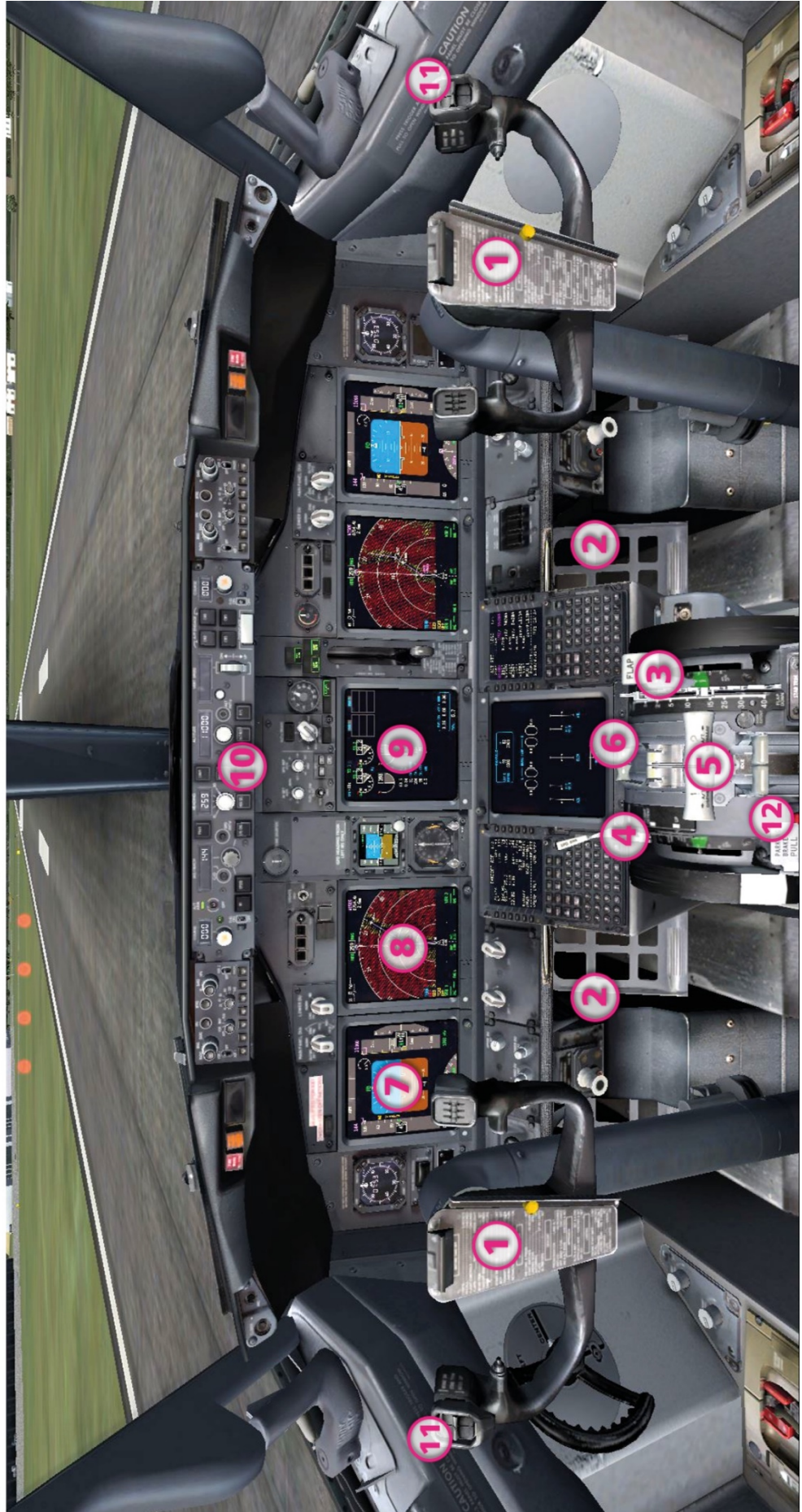
## 10) List of abbreviations

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|             |                                                     |
|-------------|-----------------------------------------------------|
| AFDS .....  | Autopilot Flight Director System                    |
| ATC .....   | Air Traffic Control                                 |
| CAS .....   | Calibrated Air Speed                                |
| COM .....   | Communication (Radio)                               |
| CPT .....   | Captain                                             |
| EICAS ..... | Engine Indicating and Crew Alerting System          |
| FD .....    | Flight Director                                     |
| FMC .....   | Flight Management Computer                          |
| FMS .....   | Flight Management System                            |
| FO .....    | First Officer                                       |
| FPM .....   | Feet per Minute                                     |
| FT .....    | Feet                                                |
| GS .....    | Glideslope                                          |
| HDG .....   | Heading                                             |
| IAS .....   | Indicated Air Speed                                 |
| ILS .....   | Instrument Landing System                           |
| KT .....    | Knot                                                |
| LOC .....   | Localizer                                           |
| MCP .....   | Mode Control Panel                                  |
| METAR ..... | METEorological Aerodrome Report                     |
| MHz .....   | Mega Hertz                                          |
| MIP .....   | Main Instrument Panel                               |
| MSL .....   | Mean Sea Level                                      |
| NAV .....   | Navigation (Radio)                                  |
| ND .....    | Navigation Display                                  |
| NM .....    | Nautical Mile                                       |
| PFD .....   | Primary Flight Display                              |
| QNH .....   | Atmospheric Pressure adjusted to Sea Level (Q code) |
| RPM .....   | Revolutions per Minute                              |
| TAS .....   | True Air Speed                                      |
| TFR .....   | Transfer                                            |
| V REF ..... | Reference Speed                                     |
| V1 .....    | Decision Speed                                      |
| V2 .....    | Safe Takeoff Speed                                  |
| VR .....    | Rotation Speed                                      |

## 11) Reference Cockpit View

|                                         |               |
|-----------------------------------------|---------------|
| (1) Yokes (Pitch & Roll Controls) ..... | p 4           |
| (2) Rudder Pedals (Yaw Control) .....   | p 4           |
| (3) Flap Lever .....                    | p 4           |
| (4) Speedbrake Lever .....              | p 4           |
| (5) Thrust Levers .....                 | p 5           |
| (6) Reverse Thrust Levers .....         | p 5           |
| (7) PFD (Primary Flight Display) .....  | pp 6, 7, 8, 9 |
| (8) ND (Navigation Display) .....       | p 6           |
| (9) Upper EICAS (Engines) .....         | pp 5, 6       |
| (10) MCP (Mode Control Panel) .....     | p 6           |
| (11) Stabilizer Trim Switches .....     | p 5           |
| (12) Parking Brake .....                | p 5           |



## 12) B737NG Normal Checklists

| Preflight Checklist                       |                        |      |
|-------------------------------------------|------------------------|------|
| *Oxygen Tested                            | 100%                   | C/FO |
| *Navigation Transfer & Display Switches   | NORM, AUTO             | FO   |
| Window Heat                               | ON                     | FO   |
| Air Cond. & Press                         | 1 Pack, Bleeds ON, SET | FO   |
| Pressurization Mode Selector              | AUTO                   | FO   |
| Flight Instruments                        | Heading, Altimeters__  | C/FO |
| Auto-brake                                | RTO                    | FO   |
| Parking Brake                             | SET                    | C    |
| Engine Start Levers                       | CUTOFF                 | C    |
| <b>* Items = First sector of new crew</b> |                        |      |

| Before Start Checklist                                               |                                |      |
|----------------------------------------------------------------------|--------------------------------|------|
| Passenger signs                                                      | ON                             | FO   |
| Windows                                                              | LOCKED                         | C/FO |
| MCP                                                                  | V2__, HDG__, Altitude__, FDs__ | C    |
| Take-off Speeds                                                      | V1__, VR__, V2__               | C/FO |
| CDU Preflight                                                        | COMPLETED                      | C/FO |
| Fuel                                                                 | __KGS, __PUMPS ON              | FO   |
| Rudder & Aileron Trim                                                | FREE & ZERO                    | C    |
| Taxi & Take-off Briefing                                             | DISCUSSED                      | C/FO |
| Exterior & Flight deck doors                                         | CLOSED & LOCKED                | FO   |
| Hydraulic Panel*                                                     | SET / "A" OFF (if pushback)    | FO   |
| Start Clearance                                                      | RECEIVED                       | FO   |
| Air Conditioning Packs                                               | OFF                            | FO   |
| Anti-Collision Light                                                 | ON                             | FO   |
| <b>NOTE: HYD "A" system ON after Ground crew clears the aircraft</b> |                                |      |

| Before Taxi Checklist                                              |                                |      |
|--------------------------------------------------------------------|--------------------------------|------|
| Generators                                                         | ON                             | FO   |
| Probe Heat                                                         | ON                             | FO   |
| Anti-Ice                                                           | As required                    | FO   |
| <b>Air Conditioning</b>                                            | PACKS AUTO, ENG BLEEDS ON      | FO   |
| <b>Isolation Valve</b>                                             | AUTO / CLOSED (bleeds OFF T/O) | FO   |
| Engine start switches                                              | CONT                           | FO   |
| <b>APU</b>                                                         | As required                    | FO   |
| Recall                                                             | CHECKED                        | C/FO |
| Engine start levers                                                | IDLE Detent                    | C    |
| Flight Controls                                                    | CHECKED                        | C    |
| Ground Crew & Equipment                                            | CLEAR                          | C/FO |
| <b>Bold Items=Configure according to FCOM SP2.9 Bleeds OFF T/O</b> |                                |      |

| Before Take-off Checklist |                               |   |
|---------------------------|-------------------------------|---|
| Cabin Report              | RECEIVED                      | C |
| Flaps                     | __GREEN LIGHT                 | C |
| Stabilizer Trim           | __UNITS                       | C |
| A/T                       | ARMED                         | C |
| Take-off announcement     | COMPLETED                     | C |
| Landing & Strobe Lights   | ON                            | C |
| Takeoff Brief & Fuel      | UPDATED / NO CHANGE & CHECKED | C |
| Transponder               | TA/RA                         | C |
| Take-off Clearance        | RECEIVED                      | C |

| After Take-off Checklist |                              |       |
|--------------------------|------------------------------|-------|
| Engine Bleeds            | ON                           | PM    |
| Packs                    | AUTO                         | PM    |
| Landing Gear             | UP & OFF                     | PM    |
| Flaps                    | UP & NO LIGHTS               | PM    |
| Altimeters               | SET & CROSS-CHECKED          | PF&PM |
| Descent Checklist        |                              |       |
| Pressurization           | LAND ALT SET                 | PM    |
| Recall                   | CHECKED                      | PF&PM |
| Auto-Brake               | SET                          | PM    |
| Landing Data             | Vref, Minimums SET           | PF&PM |
| Approach Briefing & Fuel | Discussed & Checked          | PF    |
| Fasten Belts             | ON                           | PM    |
| Approach Checklist       |                              |       |
| Altimeters               | Set & Cross-checked          | PF&PM |
| Approach Aids            | Set & Identified             | PM    |
| Landing Checklist        |                              |       |
| Cabin Report             | RECEIVED                     | PF    |
| Engine Start Switches    | CONT                         | PF    |
| Speed Brake              | ARMED, GREEN LIGHT           | PF    |
| Landing Gear             | DOWN, 3 GREEN                | PF    |
| Flaps                    | __, GREEN LIGHT              | PF    |
| Landing Clearance        | RECEIVED                     | PF    |
| After Landing Checklist  |                              |       |
| Lights                   | AS REQUIRED                  | FO    |
| Transponder              | AS REQUIRED                  | FO    |
| Flaps                    | UP (15 in icing)             | FO    |
| Stab Trim                | 4 UNITS (0-2 units in icing) | FO    |
| Speed Brake              | DOWN DETENT                  | FO    |
| Weather Radar            | OFF                          | FO    |
| Auto-brake               | OFF                          | FO    |
| Flight Director Switches | OFF                          | FO    |
| Engine Start Switches    | OFF                          | FO    |
| APU                      | STARTED & ON BUSES           | FO    |
| FLT/GRD Switch           | GRD                          | FO    |
| Probe Heat               | OFF                          | FO    |
| Shutdown Checklist       |                              |       |
| Fasten Belts             | OFF                          | FO    |
| Electrical Power         | ON APU / ON GND PWR / ON BAT | FO    |
| Anti-Collision Light     | OFF                          | FO    |
| Fuel Pumps               | OFF / 1 ON (APU)             | FO    |
| IRS Mode Selector        | OFF                          | FO    |
| Window Heat              | OFF                          | FO    |
| Wing & Engine Anti-Ice   | OFF                          | FO    |
| Hydraulic Panel          | SET                          | FO    |
| Air Conditioning         | PACKS, BLEEDS ON             | FO    |
| Isolation Valve          | OPEN                         | FO    |
| Exterior Lights          | SET                          | FO    |
| Flaps                    | UP, NO LIGHTS                | FO    |
| Parking Brake            | SET / RELEASED               | C     |
| Engine Start Levers      | CUTOFF                       | C     |