PROJECT AIRBUS

A380-800 COCKPIT MANUAL



Project Airbus Team

© 2011

Copyright 2011, Project Airbus

1. Introduction

The Project Airbus A380 virtual cockpit is a result of many years' of learning and work. Started back in 2008, several people were involved in its completion, which often took steps backwards due to members leaving, computer problems and outside obligations.

The Project Airbus A380 Virtual Cockpit model is a feature-rich model, built to the limits of the teams current knowledge. Our purpose was to create a visually accurate representation of the interior, adding many custom animations to immerse the armchair pilot. These features are:

- ***COCKPIT***
  - FS9 standard usable switches, knobs and levers on the main, overhead and pedestal panel
  - A380 style radio
  - Functional ECAM controls
  - Clickable FMS screens and functional keyboard (for VAS gauge set)
  - Animated armrests and jumpseats
  - Retractable tray tables for Captain/FO
  - Independently animated windshield wipers on the front windows
  - Sunshades
  - Retractable HUDs (where available)
  - Gauge backlighting
  - Coffee cups appearing above 10000ft AGL
  - 3D auxiliary compass
- ***CABIN***
  - Animated luggage bins
  - Animated separators between passengers' seats
  - Visible flexing wings from cabin

Copyright 2011, Project Airbus

The cockpit is configured to use Project Airbus' cockpit gauges (based on Ken Mitchell's A340 panel) or VAS. There is also the ability to have one or two HUDs in the cockpit, depending on the airline's configuration. The feature is selected from the aircraft.cfg file, where in the title section you add the required feature. For example:

title= PA A380 Lufthansa VC VASFMCgauges

- This will activate the VAS FMC set of gauges

title=PA A380 Air France VC Pagauges HUDL HUDR

- Activates the PA set of gauges
- Shows the Captain's HUD
- Shows the FO's HUD

Finally, the names of those that took part in completing this project:

The PA team:

- Demetris Themistocleous
- Derek Mayer
- Tom Collins
- Alexis Vletsas

Thanks to:

- Sheldon Fernandes
- Gary Galea
- VAS FMC team
- Andy Warden
- John Tavendale
- Steve McBee
- Shane Olguin
- Panagiotis Delizisis
- Thanasis Delizisis
- Ken Mitchell
- Fraser Turner

Copyright 2011, Project Airbus

2. Cockpit description



- The cockpit consists of the following main parts:

2.1 Main Panel

2.2 Overhead Panel

2.3 Lower ECAMs and pedestal

2.4 AFS

2.5 OITs

Copyright 2011, Project Airbus

2.1 Main Panel



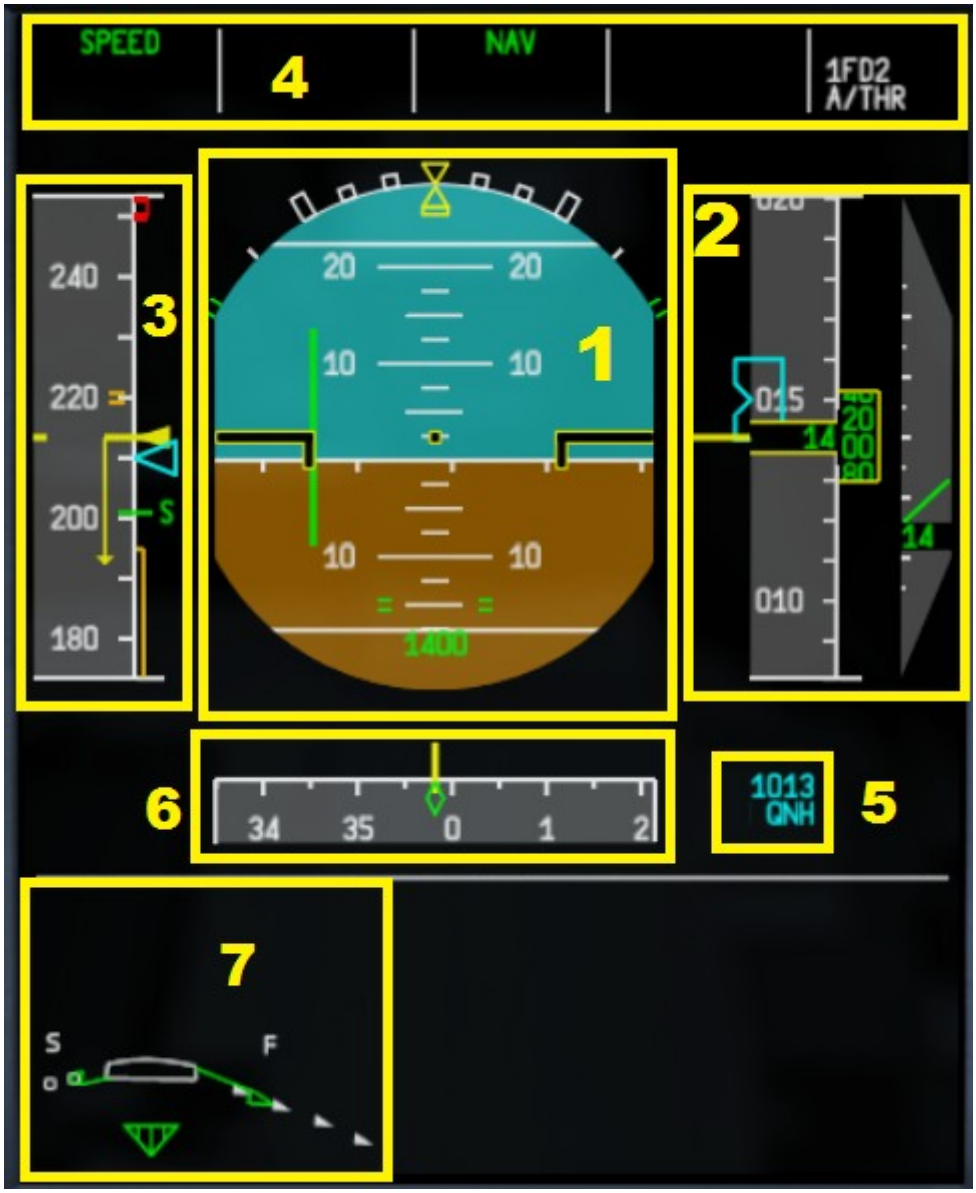
The main panel of the A380 features 5 large displays where most of the vital aircraft information is found. Specifically, there are two MFDs on each pilot's side displaying attitude and navigation information; in the middle is the Engines/Warning Display. There is also a set of backup instruments to the left, as well as the landing gear handle and situation indications, and the autobrake controls to the right.

1. Primary Flight Display (PFD)
2. Navigation Display (ND)
3. Backup Attitude and Direction Indicator (ADI)
4. Engines/Warning Display (E/WD)
5. Landing gear lever
6. Landing gear position lights
7. Autobrake controls
8. Brake pressure indicator (not modeled – mappable)
9. Backup Radio Magnetic Indicator (RMI)

Description of each instrument will follow.

Copyright 2011, Project Airbus

Primary Flight Display



1. ADI
2. Altitude and glideslope tape
3. Speed tape
4. AFS active modes
5. Barometric pressure indication
6. Heading and Localiser tape
7. Flap and Landing gear configuration

Copyright 2011, Project Airbus

Navigation Display

The ND features 5 modes, switchable from the AFS panel. These modes are (appearing clockwise, from the top left): ARC, PLAN, VOR, NAV and LS, which is shown on the next page.

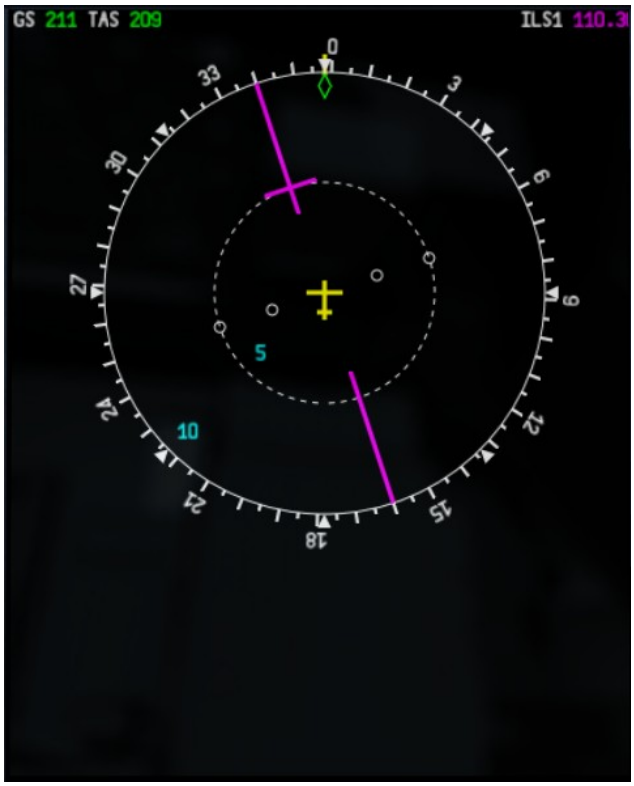


Copyright 2011, Project Airbus

All ND modes display the aircraft's Ground Speed (GS) and True Airspeed (TAS) On the top left corner.

ARC, PLAN and NAV display the selected waypoint, ETA and distance to waypoint. The difference between these three modes is that PLAN shows a N-S oriented view of your flightplan, while ARC and NAV are aligned to your aircraft's heading. Also ARC displays an area of 180 degrees in front of the airplane, while the other modes show the aircraft centered and display information 360 degrees around the plane.

The last two modes, VOR and LS are used in conjunction with the NAV radios. The tuned frequency and NAVAID's name is displayed top right, and the guidance lines appear to help guide the aircraft.



The LS mode

Copyright 2011, Project Airbus

Engine/Warning Display

The E/WD is organised in three areas:

- The top area displays engine information
- The middle area displays the aircraft memo and warnings of any problems occurring



E/WD Standard mode



E/WD Checklist mode

- When activated via the ECAM control panel, the aircraft checklists will appear in place of the memos

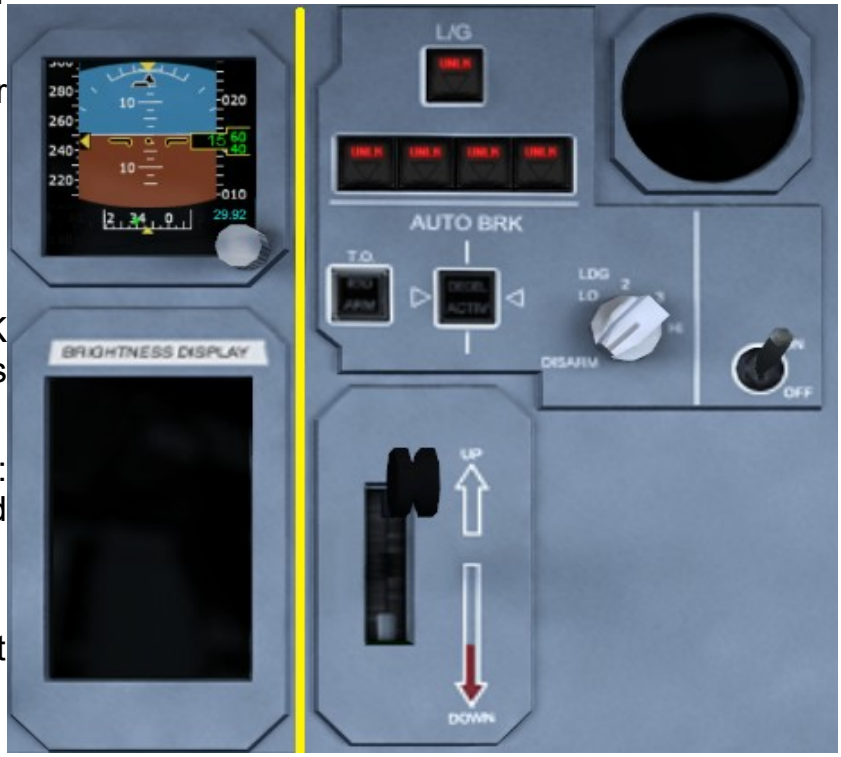
Copyright 2011, Project Airbus

Backup Instruments – Gear and Autobrake controls

To the left of the yellow line, you can see:

- the backup ADI, displaying basic flight information. Its layout is the same to that of the ADI, so no further explanation is needed.
- the backup RMI (under the ADI). It has not been modeled in this package, but any 3rd party RMI gauge can easily be mapped there

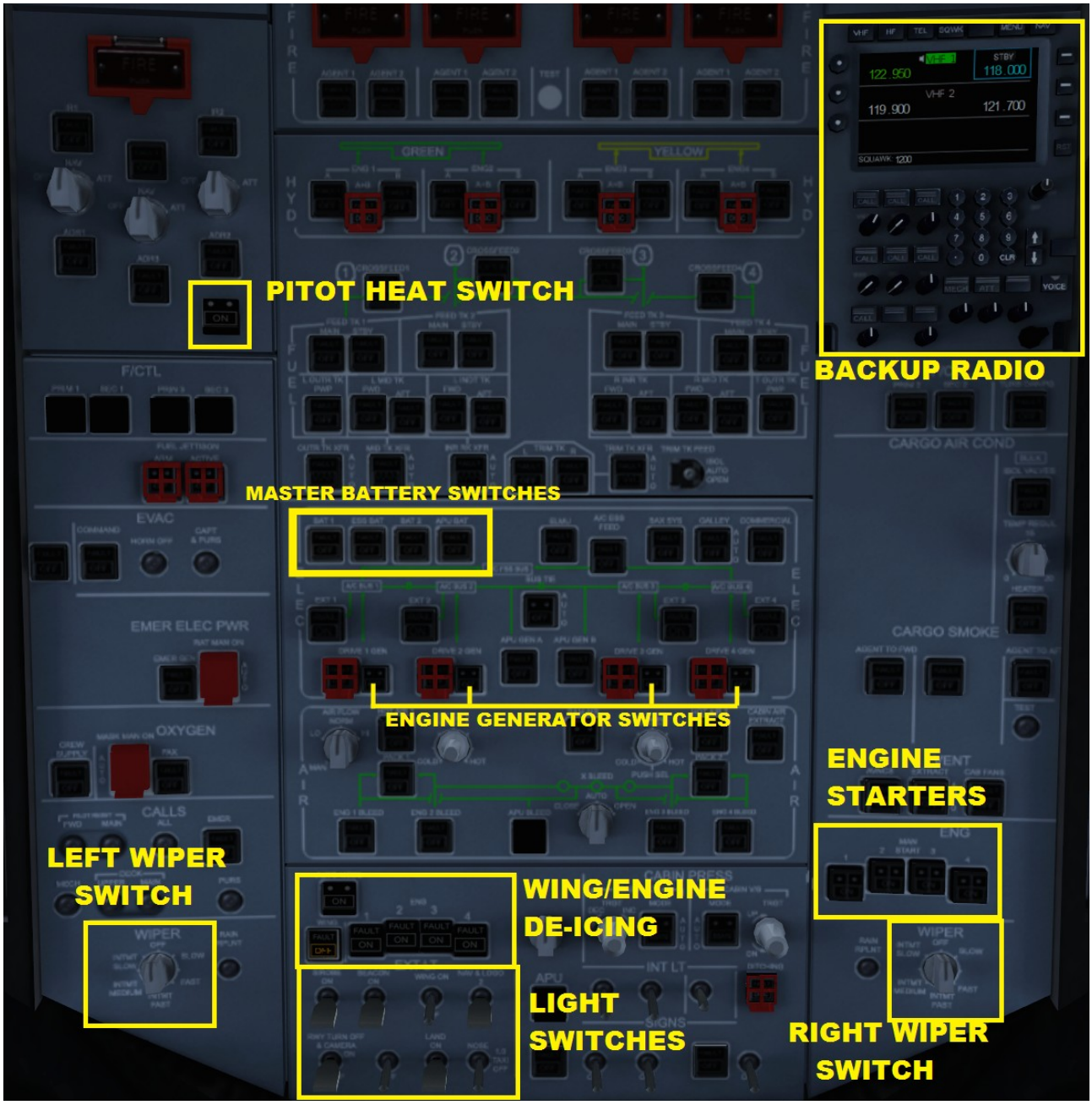
To the right of the yellow line are:



- Bottom: Landing gear lever
- Top left: Landing gear situation lights
  - Green arrows on: Gear is fully extended
  - When red UNLK lights are on: gear is extending/retracting
  - When all are off: Gear is up and stowed
- Top right: Brake pressure indicator – not modeled, but as with the RMI it can be mapped
- Middle: Autobrake switch. By dragging with the mouse you can set it to DISARM, RTO, LO, 2,3, HI

Copyright 2011, Project Airbus

2.2 Overhead panel



- The lighting, deice, starters and pitot-heat switches are FS standard
- Wiper switches: three modes -Off, slow, fast
- Backup radio: the 3rd radio on the flight deck, its operation will be explained later
- Engine Generator and Master Battery switches: turn on/off electric power supply

Copyright 2011, Project Airbus

2.3 Lower ECAMs and Pedestal panel

The lower ECAMS

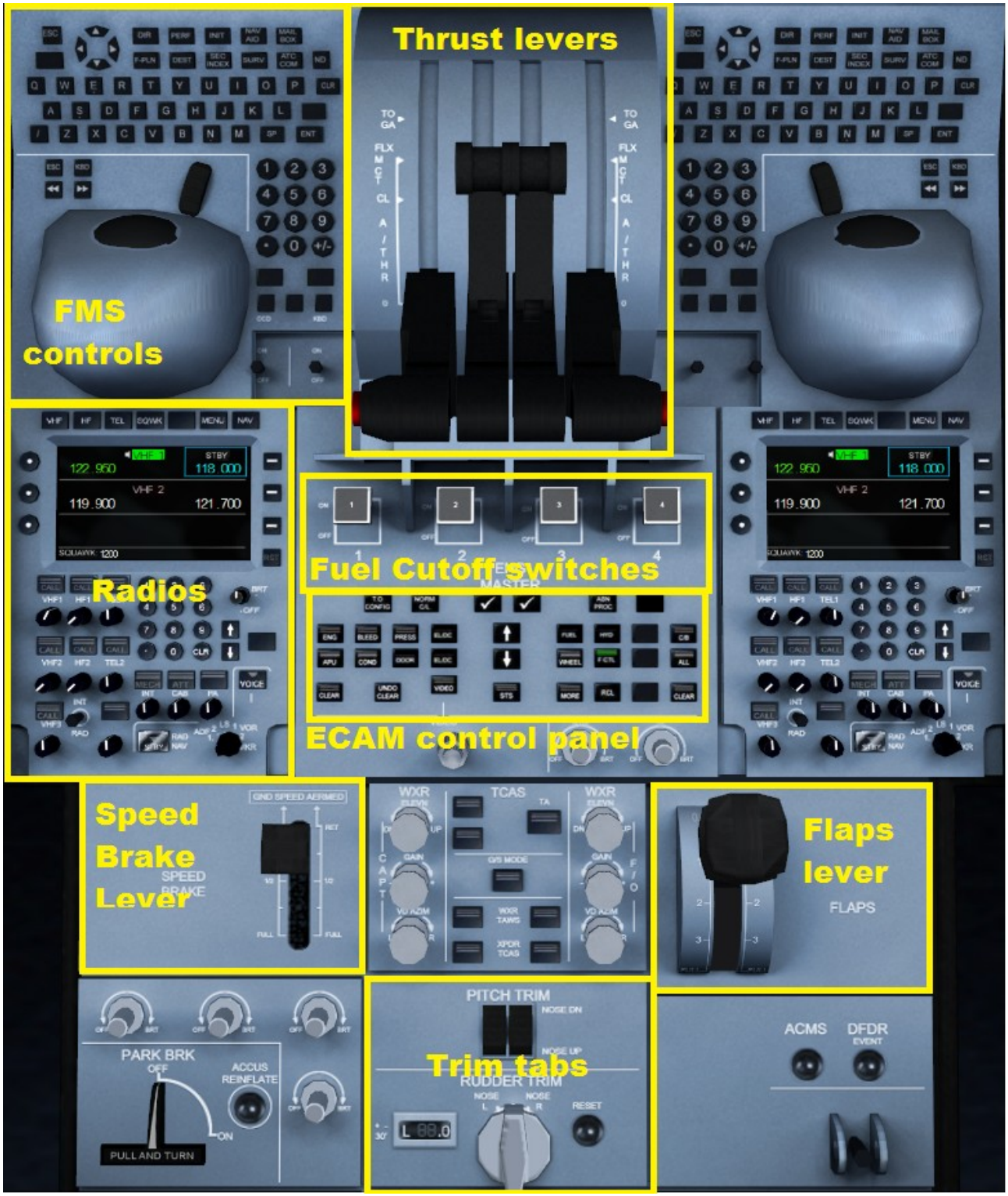


The three lower ECAM screens

- The two screens to the left and right serve as Flight Management Computers, controlled by the keyboard found to the front of the pedestal. To select the various functions on-screen, click on the screen.
- The middle screen is the Systems Display (SD). This screen is operated by the ECAM control panel, located behind the thrust levers, on the pedestal. Its modes are:
  - FUEL: Displays fuel quantity, fuel flow and relative information
  - HYD: Hydraulics page
  - F CTL: Displays detailed information regarding the control surfaces
  - DOOR: Shows the aircraft's doors and whether they're open or closed
  - EL/DC: Displays the Electrics page

Copyright 2011, Project Airbus

The pedestal

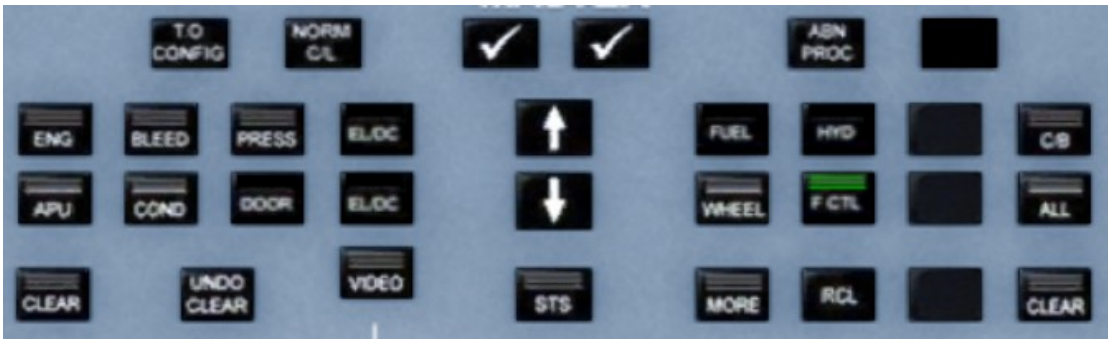


•

Copyright 2011, Project Airbus

- Thrust levers: *used to control the engine thrust*
- FMS controls: *the keyboard used to control the FMS is fully clickable with the VAS set of gauges*
- Fuel cutoff switches:
  - *ON* - Fuel flows to the engines
  - *OFF – Fuel flow to the engines is stopped*

- ECAM control panel: Used to switch between E/WD and SD modes. Usable switches (in brackets, the display affected)
  - *F/CTL (SD)*
  - *HYD (SD)*
  - *FUEL (SD)*
  - *EL/DC (SD)*
  - *DOOR (SD)*
  - *NORM C/L (E/WD): Displays the aircraft's checklists. Move between them with the up and down arrows on the control panel. Enter, exit and interact using the right tick mark*



The ECAM control panel

Copyright 2011, Project Airbus

- Speed brake lever:
  - *RET – Speedbrakes are retracted on the wing*
  - *ARM – Speedbrakes are armed and deploy on touchdown*
  - *FULL – Speedbrakes are fully extended*
  - *By dragging with the mouse, you can adjust the speedbrakes in intermediate positions, other than fully extended or retracted*

- Flaps lever: *used to control the flap and slat position*

- Trim Tabs: *used for minor adjustments to the aircraft's attitude, when flying by hand The checklists page and FBW is not working*

Radio information and operation

The Project Airbus 380 radio is operated in a very different manner than most radios. To the left you can see colour coded areas which will be explained here:



- Radio Screen:
  - *Left: active frequencies for each radio mode*
  - *Middle: Radio mode*
  - *Right: Standby frequencies for each radio mode*
- Mode select:
  - *VHF – Comm frequencies adjustment*
  - *SQWK – sets the cursor on the transponder's frequency, enabling the operator to type in a new one*
  - *NAV – Navigation radio adjustment*
- Cyan box: *used as a cursor on the screen*
- Switch freq: *Switch between active and standby frequency on the same line*
- Select active frequency: *Click on the button to turn on the respective radio.*

Copyright 2011, Project Airbus

- Select active frequency: *Click to turn on the respective radio. VHF is for COMM radios, HF for NAV radios.*
- Numeric keyboard and arrows: *used to input frequencies. CLR used to delete characters. The arrow buttons are used for moving up/down between rows*

An example of radio operation:

Supposing I see the above radio mode, I want to switch my NAV2 frequency to 108.7MHz.

- *Click on NAV*
- *Move down to NAV2*
- *Input the frequency (1-0-8-7)*
- *Click on the 2nd pushbutton to the right of the screen, to swap the frequencies*
- *Click on the button to the left of the screen or the HF2 rotary knob to hear the beacon's signal*

Copyright 2011, Project Airbus

2.4 The Automated Flight System (AFS)

The AFS is used in conjunction with the FMS to automatically fly the aircraft from the moment it leaves the ground until just before touchdown. Its operation is described below (VAS gauges).



- To adjust Barometric pressure click to the left (decrease) or right (increase) of the knob. The pressure indication is shown above
- ND info toggle switches: shows or hides ND information
  - *CSTR: shows/hides course and track information*
  - *WPT: shows/hides Waypoints*
  - *VORD: shows/hides VOR stations*
  - *NDB: shows/hides NDBs*
  - *ARPT: shows/hides airports*
- The yellow boxes represent clickspots.
  - *The square clickspots are for the ND mode and range settings*
  - *The round ones are (in a left to right order)*
    - *SPD Hold*
    - *HDG Hold*
    - *Vertical Speed (VS) Hold*
  - *To adjust SPD, HDG and VS click to the left (decrease) or right (increase) of the knob*
  - *To set any of the above settings to the FMS flight plan, left click on the knob. A dot with dashes (- - - -) next to it will appear to indicate this choice*
  - *To set them to match the planes current SPD, HDG or VS, right click on the knob. Then by increasing or decreasing you can manually set the*

Copyright 2011, Project Airbus

variable to a desired value

- Altitude is adjusted by clicking left or right of the ALT knob as above. The difference is that to select ALT mode, you click on the “ALT” button under the knob.
- LOC: Used to engage Localiser intercept mode. To change the course setting:
  - VAS: hit V and then + or – on your keyboard
  - PA Gauges: Use the knob on the backup ADI
- FD: used to engage the Flight Director
- AP1: Autopilot Master switch
- AP2: NAV mode switch
- A/THR: Engages Auto Throttle – necessary for SPD hold mode
- MACH **O** SPD: Toggles the SPD selector and screen between KIAS and Mach
- TRUE **O** MAG: Toggles the HDG mode between True and Magnetic heading
- **O** METER: Toggles ALT mode display to show meters or feet

2.5 Onboard Information Terminals (OITs)

Since we couldn't make a good gauge that could display general airport information and charts, we decided to map this gauge to the default FS9 Garmin GPS500. To operate it, click on the GPS screen for the pop-up to appear, and operate it as usual.

Copyright 2011, Project Airbus



Copyright 2011, Project Airbus