Boeing 737-800

FSX Flight Deck Panel

Version 1.0

Documentation

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Boeing 737-800 Panel

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INSTALLATION

If you are reading this you have already unzipped the ZIP file. To install the panel on any aircraft simply copy the panel to the aircraft directory either replacing the existing panel sub-directory or as "panel.XX" where XX is the name on the "panel=" entry in the aircraft.cfg.

A number of changes have to be made to the aircraft.cfg if you are using the default Boeing 737-800. Other aircraft should be checked to ensure they also have these parameters:

The entry under [Exits] should say:

number_of_exits = 3
exit.0 = 0.1, 47.0, -5.0, 2.0, 0 //openclose rate percent per second, longitudinal, lateral, vertical positions from datum (feet), type (0=Main 1=Cargo 2=Emergency)
exit.1 = 0.12, -146.0, 8.0, -7.5, 0 //openclose rate percent per second, longitudinal, lateral, vertical positions from datum (feet), type (0=Main 1=Cargo 2=Emergency)
exit.2 = 0.12, -42.3, 9.0, -7, 1 //openclose rate percent per second, longitudinal, lateral, vertical positions from datum (feet), type (0=Main 1=Cargo 2=Emergency)

The above is for the Opensky model. The same can be used for the default model but the default does not have airstairs – it has only a main exit with the airstairs switch opening the cargo doors. For either model the above coordinates will deploy the jetway correctly.

Under [hydraulic_system], electric_pumps should equal 2

Under [Autopilot] its better if default_vertical_speed is set to 1800 rather than 0.

yaw_damper_gain = 1.0 to use the Yaw damper.

The Panel also points to the Callouts from Matt Smith which are available on Simviation. They can be substituted by any other callout system if you do not have these callouts or can simply be left non-working as they do not affect the rest of the panel.

INSTRUCTIONS

Introduction

This panel has virtually all new gauges and is specifically designed for 1920X1080 monitors. There are many new features including an updated PFD based on a new hi-res photo and including V speeds, an MFD with a TAWS map option, new Standby gauges, windscreen wipers that actually work, a new Throttle Quadrant following the default concept but based on photographs, and a photo real overhead panel which is mostly functional.

This panel is meant for the average FSX user who is not a pilot. Much more sophisticated panels are available as payware.

This panel has been tested with the Opensky Boeing 737-800, which has a nice animated airstairs feature matching the unusual airstair switch on the overhead panel, and the default Boeing 737-800.

All gauges are XML gauges so although this has been tested on FSX it will probably work on FS9 as well. Note that many of the mapping features including TAWS will not work on FS9. The rest may or may not work on earlier versions of Flight Simulator.

Note that although FSX has an option for metric or imperial measurements, this panel operates on metric only for pressures and temperatures. Altitudes are still in feet.

This panel also includes a new method for operating dials using the left and right mouse buttons and a new method of operating the Throttle Quadrant using the mouse wheel.

Technical Issues

Spoilers

FSX has a technical problem when trying to deploy spoilers incrementally. If you attempt to deploy spoilers incrementally nothing will happen until about one third of the way then they will suddenly fully deploy. Subsequently they can not be retracted at all. All of the aircraft I have tested including the default aircraft have this problem. I have found this problem in FSX Gold Edition and in FSX Acceleration. Possibly other versions may not necessarily have this problem. I do not know if FS9 has the same problem.

Oddly the partial deployment of the outer spoilers in conjunction with ailerons does work correctly and the spoilers handle can be incrementally deployed while the simulation is paused (which is not much use)

Fortunately however the Spoilers on/off function still works and the default Boeing 737-800 seems to recognise this problem so like the default version this aircraft can switch spoilers on and off.

This means there is only a choice between fully deployed and retracted which is not that realistic but is the best possible solution available.

Exits

FSX allows for up to four exits to be defined in the aircraft.cfg. Internally a variable is provided to test if exits are open called “Exit Open:x” where x can be 1 to 4. This variable works only for Exit 1. The workaround has been to use “local” variables to determine if the door is open – this is how there can be four doors even if less are defined.

Night Lighting

The panel backlighting comes on automatically at night. There is no night lighting on/off switch.

Icons

There are the standard icons below the PFD with one additional “Compass” icon. Clicking on this icon will display the Compass at the top of the screen together with the bottom row of switches from the Overhead panel: all of which are functional.

Panel Controls

This panel behaves a little differently than most other panels. In order to operate any of the dials the left button on the mouse is clicked to turn anti-clockwise and the right button is clicked to turn clockwise. Some dials in the EFIS Panel have a centre press function and this is done by pressing the centre button on the mouse (which in many mice is done by pressing the mouse wheel).

This method makes it much easier to operate as there is only one mouse area per dial so any buttons can be pressed anywhere on the dial.

Simple on / off switches still use the left button as usual.

See the Throttle Quadrant section to see how this has been taken a step further to simplify operating the Throttles.

Warnings

There are many warning lights on all of the panels in the Boeing 737. It is not clear whether or not these warning lights flash – it would seem that they should but not clear that they actually do. In this panel I have set all the yellow warning lights to flash. The flashing can be switched off by clicking on the light but the light will not go off until the underlying condition has gone. Note that when the simulator is paused they do not flash so, as they flash in unison, it is possible to pause the simulator with all lights off.

Main Panel

The main features of the main panel are the three CRT screens: the first displaying the Primary Flight Display (PFD), the second, switching between MFD and PFD, and the Engine information screen (which is not a full EICAS) which can also display the navigational display (ND).

Generally it is best to leave the default displays as they are but they can be switched with the dials just above the first two screens.

The EFIS Panel at the top is fully integrated with the MFD with all buttons and dials functioning. The Autopilot is a fairly standard Boeing panel. The "Buttons" panel on the right allows the selection of display screens on the two CRTs plus a third pop-up CRT in the right windscreen.

More detailed descriptions of the sub-panels appear below:

The Clock

The clock on the Boeing 737-800 is a little different than the Boeing 747-400 as it is more "electronic" looking. I have however taken the clock from the Boeing 747 as I think it looks better. The clock and the sweep hand operate all the time including at start up. Local time is shown in the bottom window by default and GMT is shown in the top window. Clicking the date button will display the date in DDMMMYY format in the top window. Clicking again returns to GMT time.

Clicking on the CHR button will set the bottom window to zero then pressing the RUN button will start a timer in the bottom window. Pressing the RUN button again will stop the timer and pressing the CHR button while the timer is on will reset it to zero. Pressing the CHR button again after reset will return to displaying the local time.

Clicking on the bottom right Time button will immediately increase the simulation rate to 16 times. Clicking it again will return to normal time.

The Master Caution and Warning Panel

The Master Caution and Warning Panel has a number of warning lights to signal aircraft faults. These lights and their causes are listed below:

Master Caution and Warning		
Light	**Function**	**Action**
FIRE WARN	Fire in Engine	Pull Fire handle on Throttle Quadrant and extinguish fire with fire extinguisher bottles.
MAST CAUT	One or more of: - Generator Off - No Hydraulic pressure - Fuel Low - Low Oil Pressure - Low Vacuum - Low Voltage - Reversers Deployed	Investigate cause of light. Other lights should illuminate to determine the cause.
FLT CONT	One or more of: - No Hydraulic Pressure - Low Fuel Pressure - Low Oil Pressure	Aircraft can not fly. Investigate reason
IRS	Not Functional	
FUEL	Yellow: Fuel less than 10% Red: Fuel less than 5%	Land to refuel
ELEC	One or more of: - Battery Voltage less than 20 - Electrical Fault - Master Switch Off	Switch on Ground Power, APU, or Generator.
APU	Aircraft is on the ground with engines and APU off.	Start APU
OVHT/DET	Exhaust Gas Temperature greater than 900 degrees C	Reduce engine power.

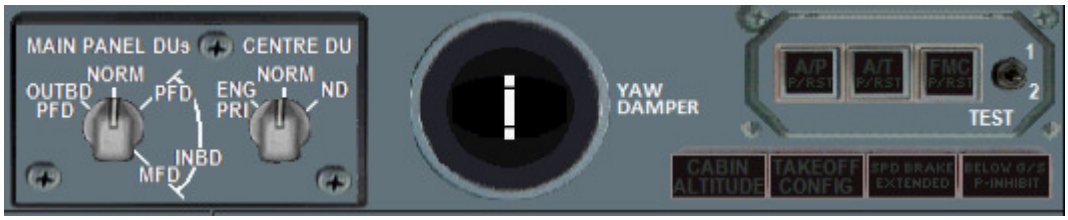
The EFIS Panel

This panel controls the settings in the MFD display.

EFIS		
Switch	**Function**	**Action**
RST Dial	Increases or decreases the Decision Height for landing. This can be seen in the Pfd and will be reflected in the Callouts during Approach.	Left click to decrease or right click to increase the Decision Height. Limits are 0 and 360 feet. Centre click changes the Decision Height from Radio to Barometric height. This has no effect in FSX.
VOR / ADF Switch Left	Switches between VOR 1, ADF 1, or no display in the bottom left of the MFD	Left Click to switch down and right click to switch up.
CTR Dial	Select between Approach, VOR, Map, or Plan for display on the VOR. Usually leave on Map for best detail.	Left click to move anti-clockwise or right click for clockwise.
TFC Dial	Alters the range on the MFD from 10 to 640 nautical miles.	Left click to move anti-clockwise or right click for clockwise.
STD Dial	Increases or decreases the barometric pressure and switches between Millibars and Inches of Mercury (IN) on the PFD and on the Standby Altimeter.	Left click to move anti-clockwise or right click for clockwise. Centre click to switch between inHg and Mb.
VOR / ADF Switch Right	Switches between VOR 2, ADF 2, or no display in bottom right of the MFD	Left Click to switch down and right click to switch up.
Buttons		
WXR	This button is used to switch the map display to a TAWS map. The TERR switch must first be selected then WXR to select TAWS.	Click once to switch to TAWS and again to switch back to Terrain display.
STA	Displays or suppresses NDBs and VORs on the MFD.	Click once to display and again to suppress the NDBs and VORs
WPT	Display Waypoints on the MFD	Click once to display Waypoints and again to suppress them.

EFIS (continued)		
Switch	**Function**	**Action**
ARPT	Display Airports on the MFD	On by default, Click once to suppress airports and again to display them.
DATA	Display additional information on the MFD – e.g. Airport names and IFR landing displays.	Press once for additional detail and again to suppress the detail.
POS	Displays a monochrome map on the MFD	Press once for the map and again to suppress the map.
TERR	Displays terrain in colour with colours depicting altitude of the terrain. The colours follow the Garmin schema and are more readable than the default colours. The water colour is also modified to give greater contrast.	Press once to see terrain and again to suppress.

The Main Panel DUs Panel, Yaw Damper, and Warnings Panel



The Main Panel DUs is a panel of two switches which controls the panel displays.
When the left switch is set to OUTBD PFD or NORM the PFD displays in the first CRT. When set to PFD the PFD also displays in the second CRT (This is in case of failure of the PFD CRT). When the dial is turned to MFD the second CRT returns to MFD display.

For the second dial, turning it left does not do anything in FSX. Turning it right displays a navigational display in the right CRT together with a popup control panel and a list of nearby aircraft. This is based on the default Radar gauges which I thought were quite good and perhaps useful. It should really be the MFD .

To the right of these switches are a Yaw Damper gauge and a small warning panel. These represent a departure from the real aircraft: the Yaw Damper should be above the Standby Attitude gauge, and the Warning Panel is actually the one from the First Officers seat but has the same functions. These changes were made due to a lack of space above the CRTs.

The warnings will come on in the following circumstances:

WARNING LIGHTS		
Light	**Cause**	**Action**
CABIN ALTITUDE	Cabin Altitude has exceeded 10000 feet.	Immediate descent and check of pressurisation. This panel does not model this as there is no provision to switch to manual.
TAKEOFF CONFIG	Throttles advanced beyond 80% on the ground but aircraft is not configured for takeoff because: 1. No Flaps are down or 2. Spoilers are deployed or 3. Parking Brake is on	Configure for takeoff or, if you manage to get off the ground, the light will go out after takeoff.
SPD BRAKE EXTENDED	Spoilers are Deployed	Retract Spoilers as required.
BELOW G/S	Aircraft is flying below the Glideslope	Maintain altitude until Glideslope is intercepted.
A/P P/RST	Aircraft is airborne but Autopilot not engaged.	Engage Autopilot as required.
A/T P/RST	Aircraft is airborne but Autothrottle is not engaged	Engage Autothrottle as required.
FMC P/RST	FMC not engaged	Not functional on this panel.

The Primary Flight Display (PFD)

The PFD displays all information about the orientation of the aircraft including Heading, Speed, Attitude, rate of climb, as well as substantially more information. This is a close replica of the appearance of the PFD on the real aircraft. It is based on the gauge used in my Boeing 747-400 panel however has been updated with new information from a superb high resolution flight deck photo and additional technical information.

In particular it now provides V speeds (V1, VR, V2, and VRef) which follow the Boeing Operational Manual (for the CFM56-7B26 engine) and which include the criteria: wet or dry runways, temperature, wind, and altitude. The only criterium not included is runway slope which can not be determined in FSX. The adjustment for slope is rarely more than 1 knot so this is not too serious. Note that the calculation for V1, VR, and V2 is made only on the ground when flaps are in a valid takeoff configuration: i.e. Flaps 1, Flaps 5, Flaps 10, Flaps 15, or Flaps 25. Flaps 2 is not a valid configuration. The calculation for Vref is made only when airborne and flaps are in landing configuration: Flaps 15, Flaps 30, or Flaps 40..

Other new features are an Altitude Alert as specified in technical documentation. (The Altitude Alert above the PFD and the one in the PFD are options for which a customer probably only chooses one but I have included both).

Note that the PFD Radio Altimeter measures altitude from its antenna to the ground but should display altitude with wheels down from its wheels to the ground. A correction factor is automatically applied by this panel which will be correct for any aircraft if it is on the ground at start. If not on the ground a correction factor of 9 feet is applied which is correct for the Opensky model but out for the default aircraft by 1 foot.

Colour on the PFD has been corrected to accurately reflect the colour observed on a high resolution photograph of the flight deck.

The bug which displayed Mach number selected approximately double that shown in the Autopilot has been fixed.

The MFD Panel

New features include concentric circles as these seem to be more common than without, matching of VOR colours with symbols, slight change in layout to more accurately reflect the real aircraft, and addition of TAWS map.

For the VORs "NS" appears when there is No signal. This is to prevent confusion when the VOR has been tuned but not detected and may not reflect the real aircraft.

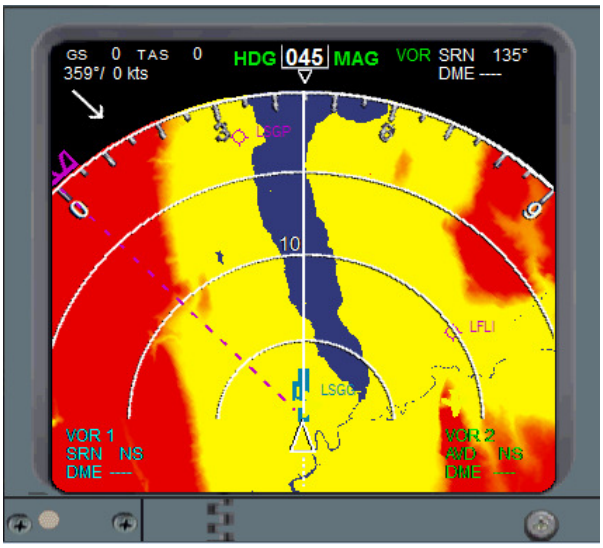
The symbols for the TCAS radar have been changed to aircraft symbols to clarify their meaning for a non-pilot.

There is new colouring for the Terrain map to give it more contrast based on the Garmin colouring and Map shadowing (see below). It has also been made more realistic by extending the display to the bottom of the screen as per the real aircraft.

The bug where the aircraft symbol was not centred on the Rose display has been fixed.

Clicking on the centre of the MFD will switch between Expanded and Rose displays.

The TAWS Map



TAWS Map

Terrain Map

The Terrain Awareness (TAWS) Map is a map which measures terrain altitudes from the height of the aircraft rather than from sea level. The system used on this aircraft follows the colour scheme specified for the Boeing 737-800 however does not have the same accuracy as colours can only be defined in FSX per 1000 feet instead of 250 feet as needed by the specification.

This TAWS map therefore shows terrain from 2000 feet below the aircraft to 1000 feet below the aircraft in Green, from 1000 feet below to 2000 above the aircraft as Yellow, and Terrain more than 2000 feet above the aircraft as Red. Other terrain is not shown. The map above is what you see if the aircraft is on the ground. The specification states that the Green should extend to 500 feet below the aircraft (or 250 feet if gear extended) and the Yellow above that.

The map is temperamental and refreshes at every 500 feet change in altitude. This can take several seconds..

Note that this TAWS map does not support look ahead terrain as this is not modelled in FSX.

Boeing 737-800 Panel

The Autopilot

This is the Boeing Autopilot as fitted to the Boeing 737-800. Extensive study indicates that the method of illuminated words for the switches is the correct one although many simulated panels use a more conspicuous method as used on other aircraft. Although not all that attractive I have used the method which reflects that used on most Boeing 737-800 aircraft. The buttons and their functions are:

AUTOPILOT		
Switch	**Function**	**Action**
COURSE	This would normally show the direction to the next waypoint as shown in the PFD. It has a dial to adjust it but otherwise does not perform any function. In the default panel it always shows 340.	Click right to rotate dial clockwise and click left to rotate anti-clockwise.
F/D ON	Switches the Flight Director on or Off	Click up for On and down for Off.
A/T ARM	Arms the Autothrottle before activating.	Click up for on and down for off.
N1	Switch to manually set maximum N1.	Click for On or Off. Always set to Auto in this panel.
SPEED	Engage or disengage Autothrottle to maintain speed shown in the IAS window.	Click once to engage and once to disengage. Note that if this is on it will hold the Speed or the Mach depending on the setting in the IAS/Mach Window
C/O Switch	Switches IAS window from Speed display to Mach number display.	Click once to switch from one to the other. Does not function if the SPEED Switch is on.
IAS / MACH WINDOW	Display the desired Indicated Air Speed (IAS) or the Mach Number depending on the setting of the SEL Switch.	Right Click to increase the desired speed or left click to decrease.
IAS Dial	Adjusts the speed shown in the IAS / MACH Window.	Right Click to increase the desired speed or left click to decrease.
VNAV Button	Engages Vertical Navigation mode which is essentially the same as Altitude hold. Engaging this button will also engage Altitude hold and vice versa.	Click once to engage and again to disengage.

AUTOPILOT (continued)		
Switch	**Function**	**Action**
LVL CHG Button	Engaging LVL CHG will bring the aircraft to the Altitude selected in the Altitude window. Performs the same function as Altitude hold.	Click once to engage and again to disengage.
Heading Window	Displays the selected Heading in Degrees (1 to 360).	Right click to increase the desired Heading or left click to decrease.
Heading Dial	Selects the Heading in Degrees shown in the Heading Window (1 to 360).	Right click to increase the desired Heading or left click to decrease.
Bank Limit Dial	Turning the outside of the dial is supposed to adjust the bank limit but this function does not work in FSX. The bank limit is always 32 degrees for the Boeing 737-800.	Non Functional
HDG SEL Button	Activate or deactivate the Autopilot Heading Hold function which will turn the aircraft to the magnetic heading selected in the Heading window.	Click once to engage and again to disengage.
LNAV Button	Engages or disengages navigation mode. When engaged the aircraft will fly along the flight path already entered in the flight plan. Note that this button also automatically connects or disconnects NAV1 to the GPS navigation.	Click once to engage and again to disengage.
VOR LOC Button	When activated the aircraft will fly to the Localiser selected by NAV1 radio but will NOT follow the glideslope.	Click once to engage and again to disengage.
APP Button	When activated the aircraft will fly to the Localiser selected by NAV1 radio then will follow the Approach glideslope.	Click once to engage and again to disengage.
Altitude Window	Displays the Autopilot selected altitude in feet.	Right click to increase the desired Altitude or left click to decrease.
Altitude Dial	Dial to adjust the Altitude shown in the Altitude window.	Right click to increase the desired Altitude or left click to decrease.
ALT HLD Button	Activates or deactivates the Autopilot Altitude hold function.	Click once to engage and again to disengage.
V/S Button	Activates or deactivates the Autopilot Vertical speed hold function.	Function not supported in FSX. Dummy switch.

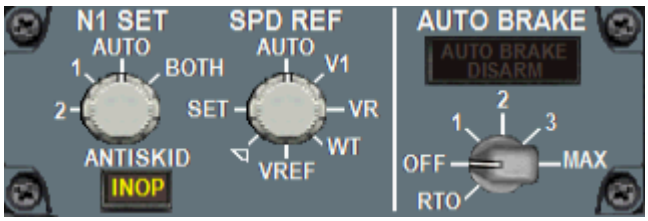
AUTOPILOT (continued)		
Switch	**Function**	**Action**
V/S Window	Displays the Vertical Speed of the aircraft in plus or minus feet per minute. The default for ascent or descent is set in the aircraft.cfg and is usually 1800 feet per minute	None
V/S Dial	Dial up or down to increase or decrease the Vertical speed.	Click on the top to decrease the vertical speed or on the bottom to increase the vertical speed.
CMD Button	Autopilot Master Switch.	Click to turn on Autopilot. Click to turn off Autopilot. Does not turn Autothrottle on or off. Note that clicking on either switch will turn on both. This is different to the real aircraft where only one is on however this is easier to understand for the FSX user.
CWS Button	Maintains the aircraft in its current attitude until released.	Press to engage or disengage pitch/roll hold.
A/P DISENGAGE	Clicking on this will disconnect both Autopilot and Autothrottle. Clicking again will not reconnect them however.	Click once to disconnect Autopilot and Autothrottle.
F/D ON	Switches the Flight Director on or Off	Click up for On and down for Off. Duplicate of switch on the left.
COURSE	This would normally show the direction to the next waypoint as shown in the PFD. It has a dial to adjust it but otherwise does not perform any function. In the default panel it always shows 340.	Turn the dial to change the course.

The Standby Attitude Indicator, Speed Indicator, and Altimeter Panel

These are new gauges developed based on photos of the Boeing 737-800 flight deck. The Attitude gauge is unfortunately not as realistic as I would like as I do not have any means to create an alpha channel.

All three gauges have been carefully calibrated and should be very accurate.

The N1 SET, SPD REF, and Autobrakes Panel



The N1 Set switch is rotated in the same way as other switches, however does not perform any function. The Antiskid INOP light goes out when Autobrakes are set.

The SPD REF Switch is to manually select the V speeds to override the automatic calculation. The Weight can also be reset so that the automatic calculation can be carried out on the revised weight.

Generally it is better to leave this switch at Auto as operating this switch is slightly complicated.

To reset V1 rotate the switch with the right mouse button to the V1 setting. The current setting of V1 will appear in the top left of the PFD. To reset V1 centre click the dial at the V1 position. Using the right and left mouse buttons will then change the V1 speed which will show on the PFD and be reflected in the V1 speed bugs. To rotate to the next position centre click again and the dial will then rotate as before. Selecting the weight will display the weight in metric tons on the PFD and this can be adjusted in the same manner. If only the weight is changed then V1 and VR will be calculated based on the adjusted weight. If V1 or VR are changed then a change in the weight will not change the adjusted V1 or VR.

To reset the settings back to automatic, move the dial to the SET position and centre click. This will reset all settings to automatic. Note that returning the dial to Auto will NOT reset any manual settings.

V1, VR, and Weight can be adjusted only when the aircraft is on the ground. Vref can only be adjusted when the aircraft is airborne.

Autobrake Switch

This switch functions as on the real aircraft with RTO setting for takeoff and 4 degrees of braking for landing.

In FSX the standard Autobrake function applies brakes on touchdown and maintains the brakes until the aircraft is stopped. This is not a realistic scenario as normally brakes are not applied at high speed and normally the pilot does not wish to completely stop the aircraft.

This panel replaces the FSX standard Autobrake function with the deployment of reversers and spoilers on touchdown and maintaining them until the speed falls below 30 knots. The Autobrake function will then return to off, engines return to idle, and spoilers are retracted. The pilot may also manually apply brakes at his option during or after the Autobrake sequence. The power of the reversers varies according to the Autobrake selection made by the pilot (1, 2, 3, or Max). Spoilers are deployed in each case. The same system applies to aborted takeoff (RTO setting) when maximum reverse thrust is applied. If RTO is selected it will activate when throttles are retarded to idle. On landing Autobraking will function if throttles are idle OR the Autothrottle is functioning.

Flaps Gauge

The Flaps gauge indicates the position of the Flaps handle – NOT necessarily the position of the Flaps. For instance, if flaps are deployed when Paused this gauge will move but the flaps will not. When running the flaps will take some time to deploy after the Flaps handle is moved.

The LE Flaps Transit light will flash while the Leading Edge Flaps are being deployed and the LE Flaps EXT light will illuminate once they are deployed. Leading edge flaps deploy for the first two increments and are fully deployed when Flaps are set to 2.

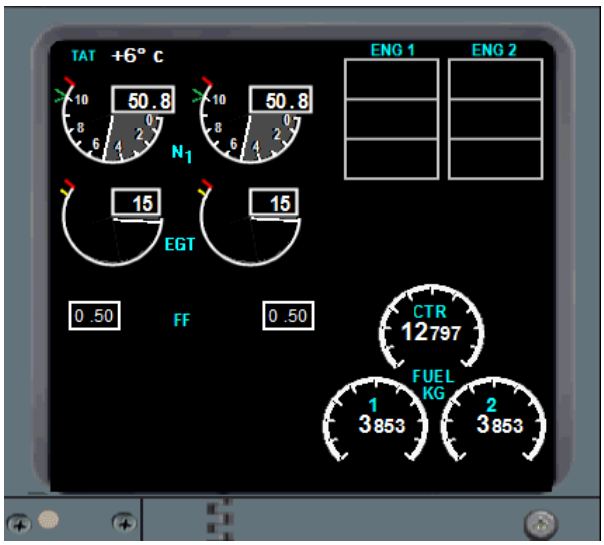
The Landing Gear Panel

The Landing Gear Panel is a fairly good replica of the Landing Gear panel in the original aircraft. The indicator lights are fully functional and will flash when the Landing Gear is in transit. When airborne with gear up no indicator lights are visible.

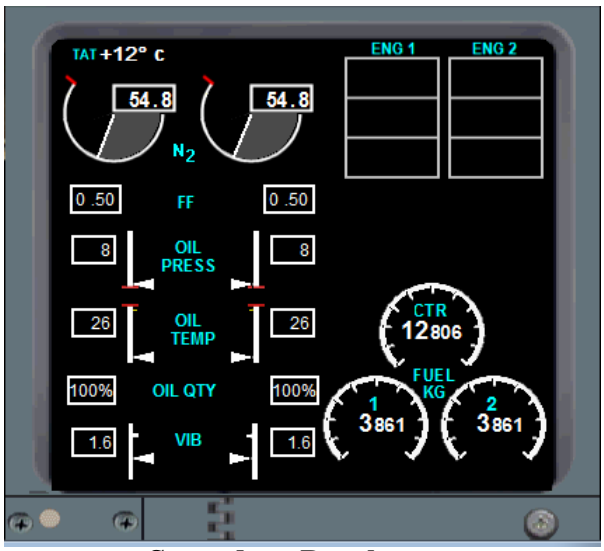
The Hydraulic Pressure Gauge

This is on the First Officers side so is shown in the correct position. It shows the total hydraulic pressure in the hydraulic system. Note that it is often below the green zone when engines are at idle however on throttling up it will move to the green zone.

The Engine Data Display Panel



Main Panel



Secondary Panel

The Engine Data display Panel on the Boeing 737-800 is not a full EICAS as appears on the Boeing 747-400 and Boeing 777 and contains engine information split across an upper and lower panel. As only one CRT is available in FSX the lower panel can be toggled by clicking on the CRT to switch between the panels. Because these panels are supposed to be visible simultaneously, the Fuel, Warning boxes, and TAT remain visible on both screens.

The boxes in the top right of the panel show error messages. Only two messages appear in this simulation as the other message is not useful for FSX.

For each engine the message “Low Oil Pressure” will appear in the bottom box when oil pressure is too low. This also occurs when the engine is off. The message “Start Valve Open” appears in the middle panel when the engine is started and disappears once the engine is running.

Boeing 737-800 Panel

Overhead Panel

The Overhead panel is based on a superb high resolution photo of a Boeing 737-800 Overhead Panel. Because of the high resolution most of the photo has been preserved including the perspective view. The downside of this is that although all the circular gauges work, the circular dials mostly do not. This does not really matter as the dials do not perform any function that is useful in FSX. Apart from the dials almost all the switches work and most of the lights.

The Overhead Panel is divided into several sub-panels as described below (from top left to bottom right).

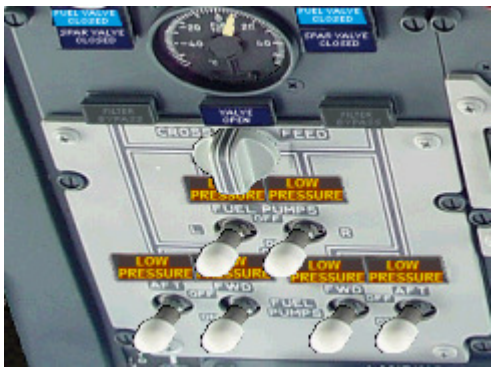
Overhead Alternate Flaps Panel

This panel is for use when Flaps power fails which is not modelled in FSX. The only switch on this panel that works is the Yaw Damper Switch to switch the Yaw Damper on or off. The Yaw Damper light illuminates if the Yaw Damper is off. Note that the Yaw damper is not as important on the Boeing 737 as it was on earlier aircraft and its use is not essential.

Overhead Navigation Panel

This panel controls the use of various computers and displays located on the real aircraft. It does not function in FSX.

Overhead Fuel Panel



This panel controls the fuel flow in the aircraft and is fully functional although the Fuel Temperature gauge actually displays the Total Air Temperature since Fuel Temperature is not available in FSX.

FSX starts initially with all Fuel switches on however the two centre switches should be switched off unless required.

Low Pressure lights will come on if the engine is not running as seen above.

Note that switching off the engine fuel switch will result in the engine shutting down.

Overhead Bottom Panel

This panel contains all of the lighting switches as well as the engine start switches.

Unusually this panel also contains an airstairs switch which is not documented in any technical documentation but nevertheless is clearly there on the photo. A left click will deploy the airstairs and click again to retract them. This switch bypasses the control in the Ground Handling panel which does not allow deployment if the left engine is running.

The engine start switch is operated with left click to start the left engine, right click to start the right engine and centre click to start both engines sequentially.

The APU Start switch is also located on this panel. To run the APU first the Start switch is set to start then either of the APU GEN switches must be switched on to supply power. Once the APU GEN switch is set to on the APU Start switch on this panel moves to On – until then it remains at Start which means the APU is running but not connected. Note that the APU GEN switch can not be switched on until the APU has been started. Switching off the APU Start will automatically switch off the APU GEN switches.

The Boeing 737 has two APUs but FSX only models one.

Boeing 737-800 Panel

All the external lights can be switched on and off from this panel. Note that the Strobe switch has 3 positions which are selected using left click for up and right click for down. Switching to Strobe & Steady switches on the Strobe and NAV lights while switching to Steady switches on the NAV lights only.

The Wheel Well light switch works but Wheel well lights are not supported in FSX.

This same panel also appears without the Overhead panel when the Compass Icon is selected from the main panel. All the switches on the Compass panel operate the same as on this panel.

The lighting switches perform as follows:

Lighting Switches		
Switch	**Function**	**Action**
LANDING LIGHTS	Illuminates the Landing Lights	Click on any switch once to switch all on and again to turn them off. The left switches are meant to be for retraction of the lights but this has not been modelled.
RUNWAY TURNOFF	Switches on and off the Runway Turnoff Lights on the left or right sides.	Click once to switch on and again to turn them off. Dummy switches.
TAXI	Switches the Taxi lights on and off.	Click once to switch on the Taxi lights and again to turn them off.
LOGO	Switches the Logo Lights on and off.	Click once to switch on and again to turn them off.
STROBE	Switches both the Strobe and NAV lights on and off.	Left to switch on Strobe and NAV lights. Right click to switch on NAV lights only.
ANTI COLLISIO N	Switches the Beacon lights on or off	Click once to switch on and again to turn them off.
WING	Switches the Wing lights on or off	Click once to switch on and again to turn them off.
WHEEL WELL	Switches the Wheel Well lights on or off.	Dummy switch.

The above is how they are supposed to work. In fact in the Opensky model the logo lights, nav lights, strobe lights and fuselage body lights are hard coded on and can not be switched off. On the default model the switches work correctly but only the beacon, nav, strobe and Landing lights work are present.

Overhead Electrical Panel

Many functions on this panel work while some do not.

The Auxiliary Fuel Transfer switches work but perform no function as FSX does not support fuel transfers.

The display panel works but can not be switched to different modes. The Amps and Volts on the left show the Main Bus Amps and the Battery Voltage. The CPS Freq and AC Volts are dummy as this data is not available from FSX.

The BAT DISCHARGE light comes on if Battery voltage falls below 20 volts.

The ELEC light comes on if there is an Electrical fault.

The covered Battery switch does work. To switch the battery on or off first right click to open the cover then left click to switch the switch. The cover will close when either mouse button is pressed. To switch again the right button must be pressed to open the cover again.

The DRIVE light comes on when the oil pressure falls below 13 psi so also comes on when the engine is not running. The other Standby Power switches are inoperative as Standby power is not modelled in FSX. The GRD POWER AVAILABLE light does however come on when the aircraft is stopped and engines switched off.

The Engine Generator Switches are used to switch the engine generators on or off. When off the SOURCE OFF light illuminates and, if the APU is not running, the Transfer bus is automatically switched on to get power from the other engine.

The APU GEN switch can not be switched on unless the APU Start has been switched on the bottom panel. Once the APU is on the Transfer bus is switched off.

All the warning lights and EGT Gauge below this are for the APU for which no data is available in FSX.

Windscreen Wipers

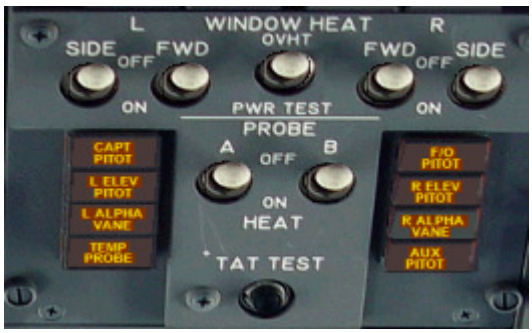
This panel comes with fully functioning windscreen wipers which operate at three speeds from the switches on the panel. The wipers are a little crude and make no difference to the rain but this is to answer all those aircraft claiming to have working windscreen wipers when they actually only have an animated switch. The wiper blades are from a Boeing 737-200.

Overhead Centre Panel

The Circuit Breaker dials do not function.

The Equip Cooling Switches do work but perform no function in FSX as do the No Smoking and Fasten Seat belts switches

Overhead Window Heat Panel



The Window Heat switches function but there is no action in FSX.

The Pitot heat alarm lights all come on when the corresponding Pitot heat switch is off. Switching it on switches off the lights.

Overhead Anti-Ice Panel

The Cowl Anti-Ice warning lights illuminate when the Engine de-ice switches are off. When the wing and Engine Anti-ice switches are turned on the corresponding blue Valve open light illuminates and the Cowl Anti Ice lights go out.

Overhead Hydraulic Panel

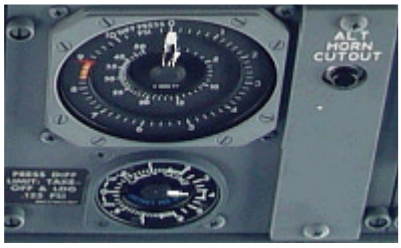
The Hydraulic Panel Switches and warning lights are fully functional. The low pressure lights come on when the corresponding pump is switched off. They all come on at startup and the Electric pump lights go out shortly afterwards. The Engine Low Pressure lights often stay on while the engine is at idle.

The lower lights illuminate when the corresponding door is open. These work best on the Opensky model where the Airstairs, FWD Entry, and Cargo lights illuminate. The other Door lights do not function.

Cockpit Voice Recorder

The Cockpit Voice Recorder (CVR) Panel is used to perform various functions with the CVR. It does not function in FSX.

Cabin Altitude Gauges

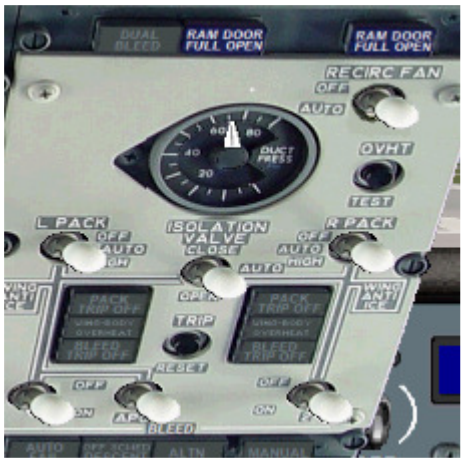


Both of the gauges on this panel work with the double needle on the first gauge measuring Cabin Altitude and Differential Pressure while the second gauge measures the rate of change in Cabin Altitude. These measurements are done automatically in FSX.

Overhead Cabin Temperature Panel

This panel can be used to set the temperature in the cabin. It does not function in this panel.

Overhead Compressed Air Panel



This panel is fully functional and controls the compressed air delivered to various aircraft systems. Air bleed can be switched on or off on each engine as well as the air compressors can be switched on or off. The Duct Pressure gauge measures the air pressure in the system.

The switches and warning lights are a pseudo-air system since FSX does not model these. The Pack Trip off light illuminates if the corresponding Engine compressor is switched off and the Isolation valve is closed preventing cross-connection to the other engine.

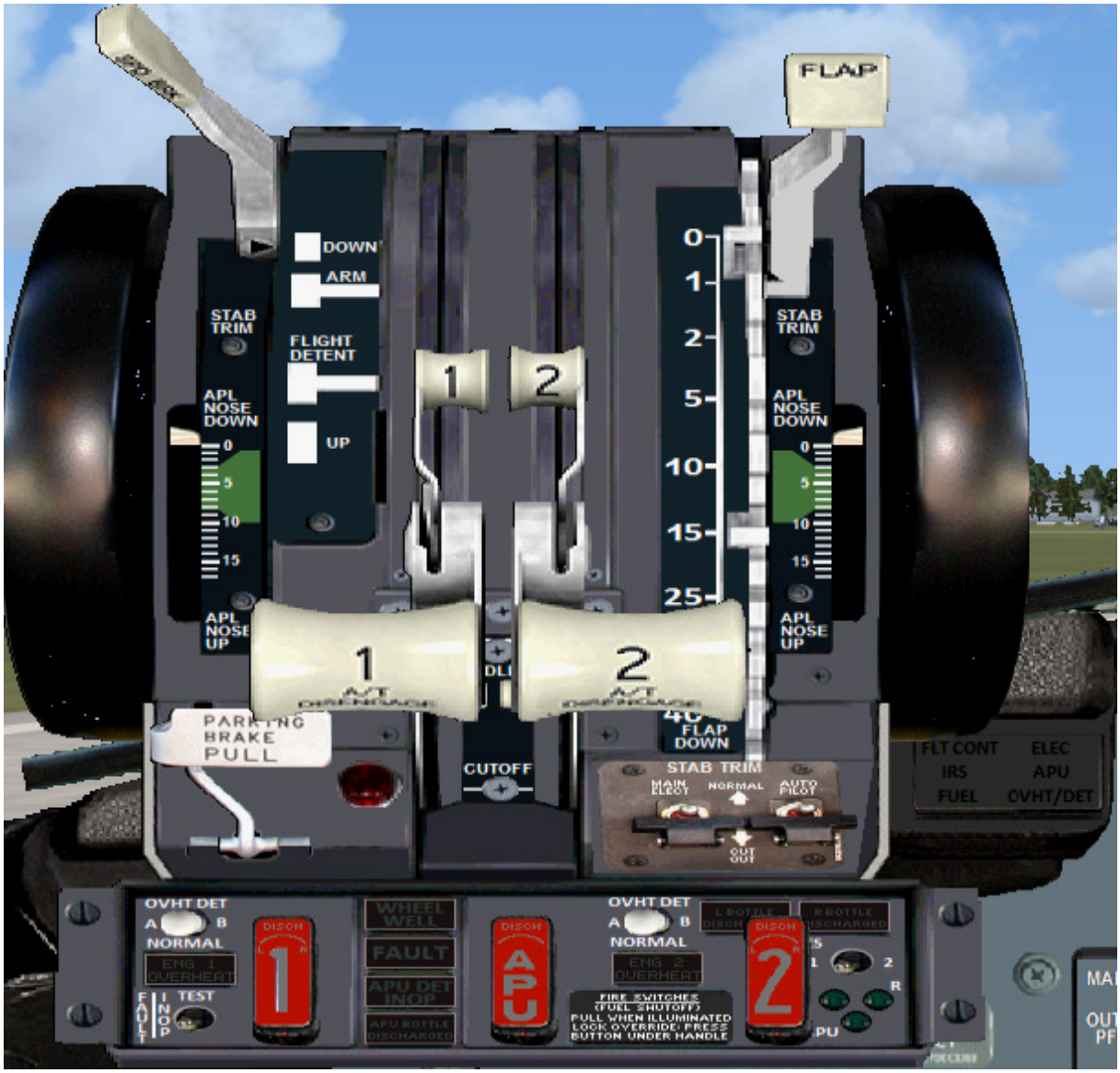
The Bleed Trip Off light illuminates when the corresponding engine compressor is switched or, on the left side, when both the Engine compressor and APU compressor are off.

Overhead Cabin Altitude Control Panel

Cabin Altitude is controlled automatically by FSX and manual control is not modelled in this panel mainly because I did not have the artwork for the switch.

The cruising altitude from the Flight Plan is displayed in the FLT ALT window and the altitude of the Destination Airport is shown in the LAND ALT window

Throttle Quadrant



Originally I intended to use the default Throttle Quadrant in this aircraft as it appeared to be pretty good. Closer inspection revealed many deficiencies so I have created this Throttle Quadrant based on the same idea but substantially enhanced graphics and features.

Throttle Operation

The Mouse grip function commonly used can be unpredictable while the mouse map that I used in my Boeing 747-400 panel is rather complex. I have come up with a new simpler way of controlling the throttle quadrant with the mouse wheel and all of the mouse buttons.

All levers are operated with left and right mouse clicks: left click to pull the lever and right click to push the lever. This can be done anywhere in the single mouse area for each lever. The Throttle itself is operated with the mouse wheel in a similar way to the slider on a joystick. More details are given under throttles.

Pitch Trim

The pitch trim is operated by the large wheels on both sides of the Throttle Quadrant. Either wheel can be used to adjust the pitch trim up or down: left click for nose down, right click for nose up.

Speed Brake

The Speed Brake is essentially on or off (see Technical Issues above) with the intermediate Arm and Flight Detent positions really doing nothing – although the Arm position does Arm the Speed Brake which actually does nothing in FSX. Only position Up will fully deploy the Spoilers.

Parking Brake

This is a simple on / off function with the red light flashing when the Parking Brake is applied.

Throttles and Reversers

The Throttles have a simple up and down sliding action. The use of the mouse may take a little getting used to but is very simple in practice.

Moving the mouse wheel up while positioned on either Throttle mouse area will increase the throttles and moving the wheel down will decrease them. By default moving the mouse wheel will move both throttles together.

To move an individual engine throttle right click anywhere in either throttle mouse area. Following the right click only the engine on which the mouse is positioned will move when the mouse wheel is turned. Moving the mouse to the other engine will also move that engine individually. To return to synchronised engine movement click the left button however note that Engine 1 throttle will move to the same position as Engine 2 on clicking the left button.

To return engines to idle click on the centre button.

If you are reducing throttle with the mouse note that it will not stop at idle but will continue and deploy the reversers from the mouse wheel. It is best to use the centre button if you want the engines idle but not reversed.

The use of the mouse wheel is fairly smooth however note that each click of the wheel increases or decreases the throttle by 10%. For the reversers each click increases or decreases the reverse thrust by 20% of the maximum reverse thrust of 25% of the forward thrust (so 5 clicks to the maximum reverse thrust).

Flaps

As with other levers the left button on the mouse deploys the Flaps by one increment and the right button retracts by one increment.

Fire Panel

The Fire Panel is fully functional and can be tested by clicking on the test switch on the right of the panel. In test mode all of the fire levers illuminate (hopefully there should be only one in a real fire). The fire bottles can then be discharged using the left mouse button to discharge the left bottle and the right button to discharge the right bottle. Note that the APU has only one bottle. Clicking on the test switch again returns the handles to normal and recharges the fire bottles.

Rudder and Aileron Trim

The Throttle Quadrant has an additional Popup panel below which can be seen by clicking on either of the two screws at the bottom left and right of the Throttle Quadrant.

The Rudder and aileron trim can be adjusted by left and right clicks on the Aileron trim levers and the Rudder trim dial.

Ground Handling Panel

This is a small heads-up display that appears only when the left side engines are shut down. Parking Brakes must be applied before any of the other functions work: clicking on the Parking Brakes switch on the panel is one way to apply them.

Where there is a Jetway it can be connected by clicking on the "Press for Jetway" Switch. Note that Jetways will generally only be visible if Scenery Complexity is set to "Dense" or more.

Up to 4 doors can be opened individually by clicking on "M" (Main) "A" (Airstairs), "R" (Rear), and "C" (Cargo) Buttons under Exits. The 4 Exits open can be seen on the Warning panel on the Overhead. These will display even if the FSX aircraft does not have all animated opening doors.

This panel has been created with the Opensky model in mind so clicking on the "A" operates the Airstairs. "R" is inoperative on the Opensky model (It opens Door 4 on other models) and "C" operates the front and rear cargo doors. On the default aircraft "M" operates the front left main door and "A" operates the front and rear cargo doors on the right.

The door opening function should not be used when the simulator is Paused as it becomes confused about which doors are open. Due to the method used by FSX to operate doors they can be quite temperamental and the buttons need to be pressed with a pause between each one.

A Fuel Truck can be requested by clicking on the "Not Requested" button.

Finally pushback can be easily done first by selecting the direction required then clicking on "Pushback Off".

Note that as this panel only becomes visible when the left side engines are off and, as FSX starts by default with engines running, it is necessary to shut down the engine before you can see this panel. The panel will disappear when the engine is restarted which normally happens after pushback.

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