REQUIREMENTS:

✓ PMDG 747 QOTS II
✓ FS2CREW PMDG 747 QOTS II EDITION. Available at: www.fs2crew.com
✓ This tutorial uses VOICE CONTROL with SOP 2

INTRODUCTION:

SOP 2 follows the procedures used at a UK based airline to a large degree. Note however, that many of the FO's callouts can be enabled or disabled to match your needs on the SECONDARY PANEL. There are also some Config options you can set as well to match your airline.

For a full list of voice commands and explanations, please consult the **MAIN OPS MANUAL**.

If you are new to FS2Crew, you should read the MAIN OPS MANUAL at least once prior to flying this tutorial!

If you have any questions or problems, please consult the FS2Crew Support Forum at Avsim.com. This is complex software and we're trying to do things as realistically as possible, so don't be afraid to ask questions!

For the Flight Route, we'll leave that up to you. Pick your favorite airport and fly there!

DISCLAIMER: This tutorial is made for flight simulation purposes only and does not necessary reflect real world procedures to their fullest. FS2Crew 747 QOTS II is an entertainment product. It is not meant for real-world flying or training. It is not affiliated or associated with any specific airline or company.

LOADING THE 747:

- Load the PMDG 747 QOTS II from the Free Flight screen.
- FSX USERS ONLY: The PMDG 747 should never be the default aircraft that loads or you WILL have problems. The default aircraft on the Free Flight screen should be a default aircraft, like the ultralight. Do not used saved situation files! If the trike is not the default aircraft, create a new saved situation file that uses the trike.

- At this point, you should be sitting in the 747's cockpit and the engines should be running. If the engines are not running, you are probably using a saved default PMDG 747 panel state file, and we generally don't recommend using a default saved panel state as they can sometimes cause the aircraft to initialize improperly.
- We need to shut off the built in **F/O CALLOUTS** or you will get double call outs via the **PMDG – OPTIONS - SIMULATION** menu as shown below:
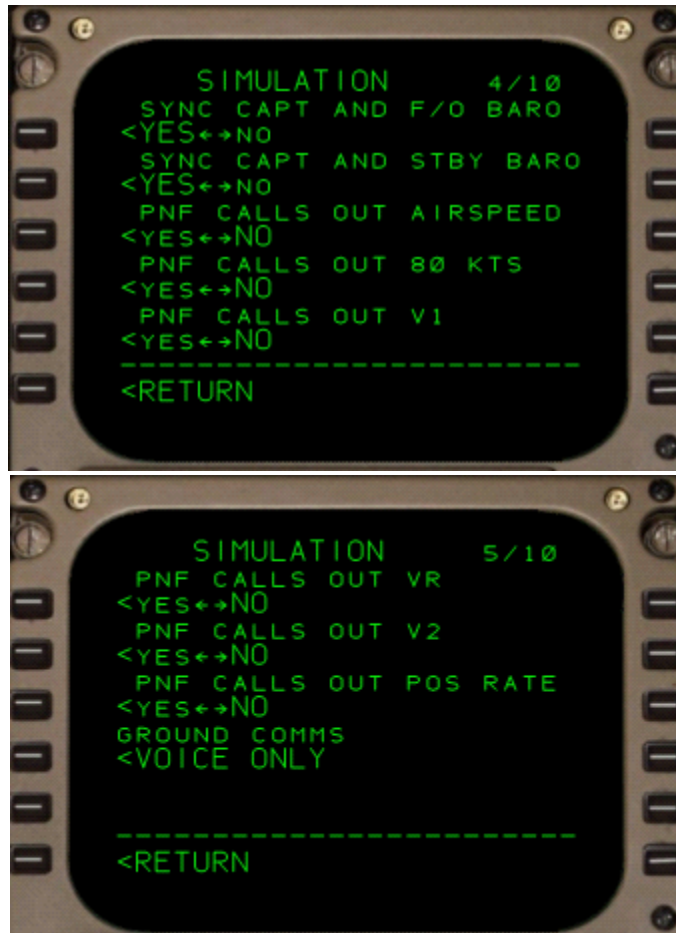
- We recommend that the F/O's altimeter and Standby altimeter syncs to the Captain's altimeter as shown below.
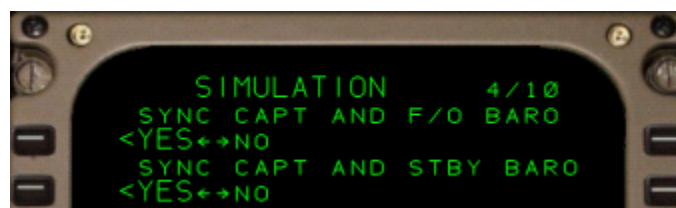
SYNC CAPT AND F/O BAR TO 'YES'.
SYNC CAPT AND STBY BARO TO 'YES'.

- Open the PMDG's FMC and select the stock **PMDG LONG** or **SHORT PANEL STATE** file. It's your choice. You don't need to do this for every flight. In fact, you can start with the engines running.

But for the sake of this tutorial we're going to start with the engines off. These two panel states are generally the most realistic panel state files to use since airline pilots rarely receive the aircraft cold and dark and most major airports supply ground power and air.

Remember: We generally do NOT recommend using a saved (default) panel state file. It's best to manually select it for each flight to ensure the aircraft loads properly.
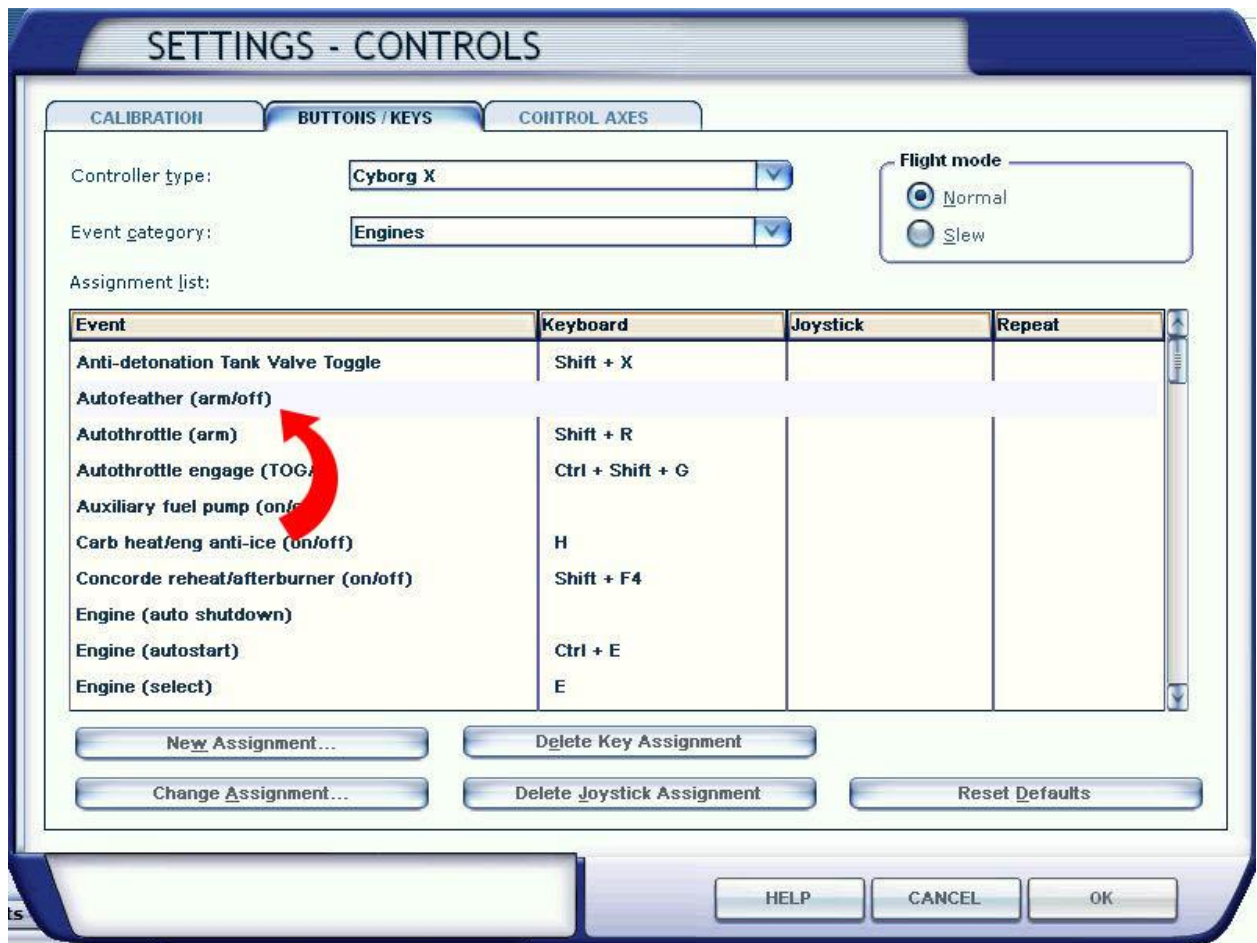

- Now we need to open the **MAIN PANEL**. There is no click spot! Press the button you assigned to open the FS2Crew MAIN PANEL (namely the one linked to **AUTOFEATHER ARM/OFF**.) If you haven't already assigned a button to this event, do it now, or you won't be able to open the MAIN PANEL.
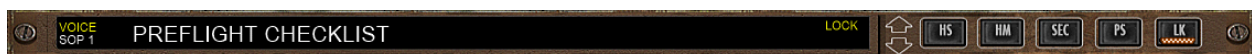- Another, but not recommended, way to open the MAIN PANEL is:

> **FSX:** VIEWS -> INSTRUMENT PANEL menu
> **P3D V3.3 and above**: VEHICLES -> INSTRUMENT PANEL menu

- If the MAIN PANEL does now show up, run the SYSTEM CHECK found in the FS2Crew 747 Configurator. Also try using the "**N**" key for AUTOFEATHER ARM/OFF.

SETTINGS - CONTROLS

CALIBRATION   **BUTTONS / KEYS**   CONTROL AXES

Controller type: Cyborg X

Event category: Engines

Flight mode
- Normal
- Slew

Assignment list:

Event	Keyboard	Joystick	Repeat
Anti-detonation Tank Valve Toggle	Shift + X		
Autofeather (arm/off)			
Autothrottle (arm)	Shift + R		
Autothrottle engage (TOGA)	Ctrl + Shift + G		
Auxiliary fuel pump (on/off)			
Carb heat/eng anti-ice (on/off)	H		
Concorde reheat/afterburner (on/off)	Shift + F4		
Engine (auto shutdown)			
Engine (autostart)	Ctrl + E		
Engine (select)	E		

New Assignment...   Delete Key Assignment

Change Assignment...   Delete Joystick Assignment   Reset Defaults

HELP   CANCEL   OK

We highly recommend using the "N" key for the Autofeather (Arm/off)

- For a detailed explanation of the MAIN PANEL and its functions, please consult the **MAIN OPS MANUAL**.
- It's also a good idea to assign keys to **SOFT** and **HARD MUTE**, especially if you are using on-line ATC. Please see the **MAIN OPS** manual for information on how to set those keys up. They are unchanged from previous versions of FS2Crew.
- Now we need to open the **SECONDARY PANEL**. Press the **SEC** button on the MAIN PANEL.
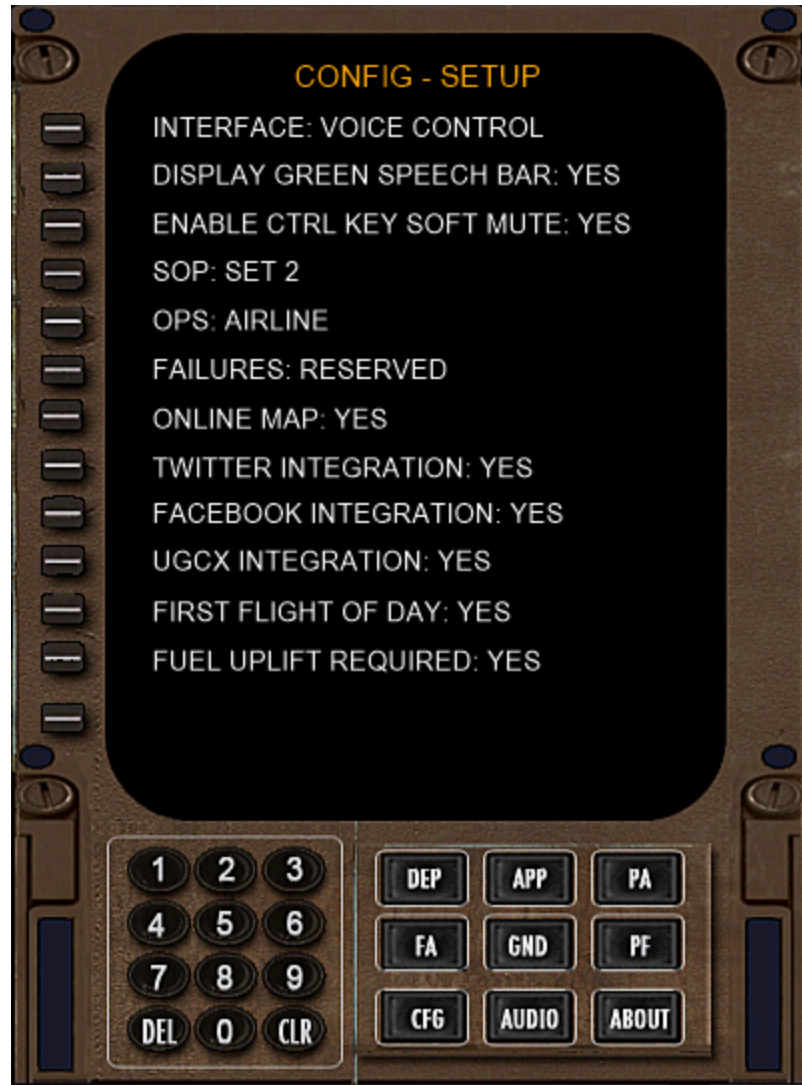
- Press the **CFG** button on the FMC to open the CONFIG menu.
- Press LSK 1 (Left Line Select Button) to open the **SETUP** page.
- By default, FS2Crew is running in BUTTON CONTROL mode. We need to change that to **VOICE CONTROL**.
- Press LSK 1 to change the Interface to **VOICE CONTROL**.

- Next, press the **AUDIO** button on the SECONDARY PANEL.
- Select your **CREW REGION** by pressing LSK 1. This setting controls the regional accent of the crew.
- If you are using a headset, select the audio device associated with your headset by pressing LSK 4 (HEADSET AUDIO DEVICE).
- Press LSK 7 to play the audio test. From your main speakers, you should hear "*Left speaker test…. Right speaker test… Audio test complete*".

AUDIO SETUP

CREW REGION: UK
CREW VOLUME: 3
CABIN PA VOLUME: 1
HEADSET AUDIO DEVICE:
>Headset Earphone (Microsoft LifeChat LX-

>PLAY AUDIO TEST

>RESET AUDIO SYSTEM

- Note the button that says **RESET AUDIO SYSTEM**. Only press that if you seem to lose FS2Crew audio; that can happen if your audio device momentarily disconnects from the system.
- Now we need to run the Pre-Flight events. Running the Pre-Flight events is **OPTIONAL**, but we'll run it anyway for the sake of the tutorial.
- Press the **PF** button on the SECONDARY PANEL to open the **PRE FLIGHT EVENTS** page.
- Press LSK 4 to run the Preflight Events (your engines must be shutdown first).

- To close the SECONDARY PANEL, press the SEC button on the FS2Crew Main Panel, or click the right screw in the top right hand corner of the SECONDARY PANEL.

PRE-FLIGHT EVENTS:

Special Note: To **FAST FORWARD** the **PRE FLIGHT EVENTS TIME**, <u>RIGHT CLICK</u> the <u>DOWN ARROW</u> on the FS2Crew Main Panel or press LSK 4 on the **PRE FLIGHT EVENT PAGE**.

NOTE: All times listed below are approximate.

+60 Minutes: Pre-Flight Events start. Jetway connects if available. Door 2L opens.

+59 Minutes: ONLY if the APU or GPU are not supplying electrical power, FO starts the **ELECTRICAL POWER UP SUPPLEMENTRY PROCEDURE** unless you've selected otherwise in the FS2Crew Options menu. Note that in real life, pilots rarely receive the aircraft cold and dark, especially in passenger operations.

Note: If using a Freighter model, the FO will not turn on APU GEN #2 or EXT PWR #2 so that the cargo doors may be powered.

ELECTRICAL POWER UP SUPPLEMENTARY PROCEDURE
-CAPTAIN OR FO.   TUTORIAL ASSUMES FO WILL DO IT BASED ON DEFAULT ON DEFAULT CONFIG OPTION.

C
- *BATTERY ON*
- *STANDBY POWER AUTO*
- *HYDRAULIC PUMPS OFF*
- *WINDSHIED WIPERS OFF*
- *ALTERNATE FLAPS SELECTOR OFF*
- *LANDING GEAR DOWN*
- *ESTABLISH ELECTRICAL POWER (IF GPU NOT CONNECTED, FO STARTS APU)*
- *NAV LIGHTS ON*

+
5

SAFETY CHECKLIST (PLEASE)

POWER ISOLATOIN SWITCHES (F)	NORMAL
ELT (AS FITTED) (F)	ARMED
BATTERY (F)	ON
STANDBY POWER (F)	AUTO

DEMAND PUMPS (F)	OFF
FUEL XFER MAIN 1 AND 4 (F)	OFF
ALTERNATE FLAPS (F)	OFF
LANDING GEAR LEVEL (F)	DOWN
FLAP LEVER / FLAPS (F)	AGREE
EXT/APU POWER (F)	ESTABLISH

+54 Minutes: Forward cargo door opens. If using a freighter model, the nose cargo door will open. FO sets IRS to NAV. (Note: You need to enter the position in the CDU. The FO will not do that).

+53 Minutes: Aft cargo door opens. Bulk cargo and cargo side door also open.

+50 Minutes: FO starts his walkaround.

+35 Minutes: FO returns from walkaround.

+34 Minutes: FO starts Pre-Flight and CDU Pre-flight procedures. (A Config option is available to disable this.)

Note: FO does not perform the various Supplementary Tests, such as the Fire tests, as they are performed by engineering.

PREFLIGHT PROCEDURE
-FIRST OFFICER. TUTORIAL ASSUMES FO WILL DO IT BASED ON DEFAULT CONFIG OPTION.

NOTE: The various tests (CVR, WX RADAR, TCAS, GPWS) are not part of the normal Preflight Procedure, and are not usually run in during everyday operations. They are 'Supplementary Procedures' and those tests are usually performed by the engineers.

- *EEC SWITCHES NORM*
- *ULITITY POWER SWITCHES ON*
- *BUS TIE AUTO*
- *GEN SWITCHES ON*
- *ENGINE HYD PUMPS ON*
- *EMERGENCY EXIT LIGHTS ARMED*
- *SERVICE INTERPHONE OFF*

- *FUEL TRANSFER 1 AND 4 OFF*
- *ENGINE FIRE SWITCHES OFF*
- *APU FIRE SWITCH IN*
- *CARGO FIRE ARM SWITCHES OFF*
- *ENGINE START SWITCHES IN*
- *STANDBY IGNITION NORMAL*
- *CONTINUOUS IGNITION OFF*
- *AUTO IGNITION SINGLE*
- *AUTO START SWITCHES ON*
- *FUEL JETTISON NOZZLE VALVE SWITCHES OFF*
- *ALL FUEL CROSS FEED SWITCHES ON*
- *ALL FUEL PUMPS OFF*
- *ENGINE AND WING ANTI ICE OFF (8 MODELS: AUTO)*
- *WINDOW HEAT ON*
- *WIPERS OFF*
- *PASSENGER OXYGEN SWITCH NORM (GUARD CLOSED)*
- *YAW DAMPERS ON (UPPER AND LOWER)*
- *PRESSURIZATION PANEL SET*
- *PAX AND FLIGHT DECK TEMP SELECTORS AUTO*
- *TRIM AIR ON*
- *RECIRC FANS ON*
- *AFT CARGO HEAT OFF*
- *EQUIPMENT COOLING SELECTOR NORM*
- *HIGH FLOW SWITCH OFF*
- *GASPER SWITCH ON*
- *PACKS ON IF AIR CONDITIONING CART NOT ATTACHED (BELOW 20 DEGREES C: ONE PACK ON.   ABOVE 20 DEGREES C: TWO PACKS ON)*
- *ISOLATION BLEED VALVES ON*
- *ENGINE BLEEDS ON*
- *APU BLEED ON*
- *LIGHTING PANEL SET*
- *STATUS DISPLAY SWITCH PUSH*
- *SET BARO (IN/HPA) BASED ON CURRENT REGION*
- *CHECK CDU PAGES*
- *SET 121.5 ON VHF RIGHT*
- *SET TCAS PANEL*
- *AUTOBRAKES RTO*
- *OXYGEN TEST*
- *CHECK OXYGEN ON STAT PAGE*
- *SET QNH*
- *GPWS PANEL SET*
- *GEAR AND TERRAIN OVERRIDE OFF*
- *EIU SELECTOR AUTO*
- *HDG SWITCH MAGNETIC*

PREFLIGHT PROCEDURE
-CAPTAIN

- *ATIS OBTAIN*
- *TAKEOFF DATA CARD / RUNWAY TAKEOFF WEIGHT OBTAIN*
- *TECH LOG CHECK*
- *IF REFUELLING, SET DOOR L5 TO AUTO*
- *EFIS PANEL SET*
- *FLIGHT DIRECTORS ON (CAPT SIDE FIRST, THEN FO'S SIDE). REMEMBER: CAPT TURNS ON BOTH FD'S.*
- *AUTOTHROTTLE ARM*
- *BANK LIMIT SELECTOR AUTO*
- *AUTOPILOT DISENGAGE BAR UP*
- *SPEED BRAKE LEVER DOWN*
- *PARKING BRAKE SET*
- *FUEL CONTROL SWITCHES CUTOFF*
- *AUDIO PANEL SET*
- *NO SMOKING SIGN ON*
- *SEAT BELT SIGN ON (WHEN REFUELLING COMPLETE)*
- *TRANSPONDER (TCAS) PANEL SET*
- *OXYGEN TEST AND SET*
- *INSTRUMENT PANEL SET*
- *ALTIMETERS SET AND CROSS CHECK*
- *STANDBY ALTIMETER SET QNH*
- *CDU LOAD DATA*
- *MCP: SELECT V2, ARM LNAV/VNAV, ENTER RUNWAY HEADING AND INITIAL ALTITUDE*

PA & EVACUATION ALARM TEST PROCEDURE:

- Speak: PA CHECK FROM THE FLIGHT DECK. FLIGHT INFORMATION: THIS IS A TEST ONLY OF THE EVACUATION ALARM. You can also do this via the PA page on the SECONDARY PANEL.
- **EVAC COMMAND** button to **ON**.
- Flight service Manager will call on the interphone to report on the PA and EVAC test. When you hear the chime sound approximately 10 seconds later, speak: HELLO / FLIGHT DECK / HELLO FLIGHT DECK.
- Re-select **EVAC** to **ARM**.

+ 30 Minutes: FA asks if she can start the boarding. Respond: "YES / GO FOR IT/ OKAY". Actual boarding will commence approximately two minute later.

+25 Minutes: Fuel Slip arrives and is delivered to the FO. Only occurs if the FS2Crew **FUEL UPLIFT** option is set to YES.

+20 Minutes: Obtain clearance from ATC. Confirm ATC clearance matches SID loaded in FMC and that altitude entered in MCP matches your cleared altitude. Enter transponder code as required.

+15 Minutes: Run the Departure Brief. There are two options: You can open the FS2Crew SECONDARY PANEL and press DEP to and play the Departure Brief there. Or you can speak: "ARE YOU READY FOR THE DEPARTURE BRIEF?" Close the brief by asking: "ANY QUESTIONS?". It's recommended that you engage HARD MUTE if doing a verbal brief to avoid the speech recognition system from acting on any detected words.

+ 9 Minutes: Forward cargo door, nose cargo and bulk cargo door close.

+ 8 Minutes: Bulk cargo door and cargo side door close. Main electrical cargo door closes.

+ 7 Minutes: Loadsheet arrives either via ACARS or in person (Config Option)

+6 Minutes: After the fueling, tech log and loadsheet have been reviewed, complete the CDU FINAL PREFLIGHT PROCEDURE.

CDU FINAL PREFLIGHT PROCEDURE
-CAPTAIN

- *COMPLETE CDU (PERF INIT PAGE AND TAKEOFF REF PAGE)*
- *MCP SET (IAS TO V2, VNAV/LNAV ARM, RWY HDG SET, INITIAL ALT SET)*
- *SET MDA TO ENGINE OUT ACCELERATION HIGHT + FIELD ELEVATION*
- *CHECK TAKEOFF DATA AGAINST THE LOADHSHEET*
- *SELECT TAKEOFF PAGE ON CDU*

-FIRST OFFICER / PILOT MONITORING

- *SELECT LEGS PAGE ON CDU*

+ 5 Minutes: If APU not running and the Air Start Cart is not connected, FO asks if you wish to start the APU. Respond: "YES / GO FOR IT/ OKAY / NO / NO THANKS".

+ 4 Minutes: Aft cargo door closes.

+ 3 Minutes: Boarding is complete. The FA will notify you that the cabin is ready and if she can close the cockpit door. Respond: "THANKS / THANKS IT WILL BE A SHORT TAXI / THANKS IT WILL BE A LONG TAXI / CLEARED TO CLOSE SHORT TAXI / CLEARED TO CLOSE LONG TAXI".

+ 2 Minutes: If the Air Start Cart is not connected and the APU is running and on the busses, the wheel chocks will be automatically removed. The Air Conditioning Cart will also be removed if it is connected. Door 2L will close and the Jetway will disconnect.

+1 Minutes: Ask the ground crew if you can pressurize the hydraulics. Configure the audio system to be able to talk to the ground crew (press the MIC button above FLT on the Captain's audio panel).

Speak: "COCKPIT TO GROUND", wait for the reply, then speak: "CAN WE PRESSURIZE THE HYDRAULICS?"

You can also initiate a conversation with the ground crew by dialing **P1** on the interphone. To do that, press **P** then **1** on the interphone panel.

When the FO asks you if you are cleared to pressurize during the BEFORE START PROCEDURE, speak: "YES".

BEFORE START PROCEDURE
-CAPTAIN / PILOT FLYING

- *NO ACTIONS REQUIRED*

BEFORE START PROCEDURE
-FIRST OFFICER / PILOT MONITORING

- *VERIFY DOORS CLOSED*
- *ASK CAPT IF CLEARED TO PRESSURIZE THE HYDRAULICS*
- *IF APU RUNNING AND USING A FREIGHTER MODEL, APU GEN #2 ON*
- *HYD DEMAND PUMP 4 AND 1 - AUX, 2 AND 3 – AUTO.*
- *IF AIR START CART CONNECTED: PACKS OFF*
- *FUEL PANEL SET*
- *PACKS 2 AND 3 OFF (IF CARGO: ALL PACKS OFF)*
- *BEACON AND STATUS SELECT*

+0 Minutes: After the BEFORE START PROCEDURE has been completed, speak: "BEFORE START CHECKLIST TO THE LINE" down to CLEARED TO START.

Checklist Notes:

B = Responded by both flight crew members.
F = Responded by the FO only.
C = Responded by the Captain only.

Items in RED TEXT are to be spoken by you, the Captain.
The FO will respond to many of his own challenges if the item falls within his area of responsibility.

If you ever get stuck on a checklist item due to a speech recognition issue, speak "SET AND CHECKED".

BEFORE START CHECKLIST TO THE LINE (PLEASE)

AUTOSTART (C)	ON
OXYGEN MASKS (B)	SET
ALTIMETERS (C)	___ SET (EXAMPLE: 2 9 9 2 TWO SET)
FUEL CONTROL SWITCHES (C)	CUTOFF
PARKING BRAKE (C)	SET
PASSENGER SIGNS (C)	ON AND ON
BRIEFING (B)	STATED

-----CLEARED TO START-----

After receiving Engine Start clearance from ATC, run the checklist below the line.

BEFORE START CHECKLIST BELOW THE LINE

TAKEOFF DATA / MCP (C)	CHECKED AND SET
DEMAND PUMPS (C)	AUX AND AUTO
FUEL LOAD, CROSSFEEDS AND PUMPS (C)	CHECKED AND SET
PACKS (C)	2 AND 3 OFF
TRIMS (C)	___ UNITS SET ZERO AND ZERO
DOORS (C)	CLOSED
BEACON (C)	BOTH
TRANSPONDER TCAS	CODE CHECKED STANDBY /
	CODE CHECKED TA RA TRAFFIC

NOTES:

For **TRIMS**, only give the trim value to <u>one or less</u> decimal places. EX: 6 UNITS ZERO AND ZERO or 5.4 UNITS ZERO AND ZERO.

Read the Trim value from the Stab Trim indicator, <u>not</u> the FMC.

PUSHBACK AND ENGINE START:

- For pushback, use the built in PMDG pushback until Ultimate Ground Crew X is released.
- Speak "START SEQUENCE IS FOUR THREE TWO ONE" or "START SEQUENCE IS FOUR ONE TWO THREE" as desired.
- if you wish to start two engines at a time, "START SEQUENCE IS FOUR AND THREE THEN TWO AND ONE".
- Use the following commands to start the engines.

  NON-AUTO START (ENGINES MUST BE STARTED INDIVIDUALLY)

  - START ENGINE 4
  - START ENGINE 3
  - START ENGINE 2
  - START ENGINE 1

  AUTO START:

  - START ENGINES 4 AND 3
  - START ENGINES 2 AND 1

- After the FO pull the start lever, set the fuel control lever for the associated engine to RUN.
- If you wish to perform a cross bleed start, start Engine 4, then disconnect the Ground Air Start Equipment, then advance the throttle on Engine 4 to 70% N2 in the 747-400 (or 82% N2 in the 747-8), then start the remaining engines normally.

AFTER START ACTIONS PROCEDURE:

▪ Command: "AFTER START ACTIONS (PLEASE)".

AFTER START ACTIONS
-PILOT MONITORING

- *SEAT POWER ISOLATION SWITCH (NOT MODELLED)*
- *IF APU TO PACKS TAKEOFF: LEFT AND RIGHT ISOLATION VALVES SWITCHES OFF*
- *IF PACKS ON OR PACKS OFF TAKEOFF: APU OFF*
- *HYDRAULIC DEMAND PUMPS AUTO*
- *ENGINE AND WING ANTI ICE AS REQUIRED*
- *AFT CARGO HEAT ON*
- *PACKS NORM*
- *RECALL AND STATUS SELECT*
- *ACMS QAR ON (NOT MODELLED)*

▪ After the AFTER START ACTIONS are complete and you are clear of any ground equipment or ramp staff, call for the takeoff flap: "FLAPS 10" or "FLAPS 20".
▪ If the taxi route is through slush or standing water at temperatures below freezing, taxi with the flaps up. Command: "LEAVE THE FLAPS UP FOR TAXI".

Command: "AFTER START CHECKLIST" when the Before Taxi Procedure is completed.

AFTER START CHECKLIST (PLEASE)	
APU (C)	OFF
DEMAND PUMPS (C)	AUTO
ANTI ICE (C)	OFF / NACELLE ANTI ICE ON / NACELLE AND WING ANTI ICE ON
AFT CARGO HEAT (C)	ON
PACKS (C)	NORMAL
RECALL (B)	CHECKED
GROUND EQUIPMENT (B)	CLEARED
ACMS (F)	QAR ON

TAXI PROCEDURE:

- Release the parking brake and announce: "CLEAR LEFT". That is the trigger for the PM to turn on the TAXI / INBOARD LANDING LIGHTS and RUNWAY TURNOFF LIGHTS.
- When ready, perform the FLIGHT CONTROLS CHECK.

    THE FLIGHT CONTROL CHECK:

    1. Command: "FLIGHT CONTROLS CHECK YOUR CONTROLS".
    2. The FO will deflect the ailerons and elevator and announce their position. Note that joystick interference may override FS2Crew's attempt to simulate the FO positioning the flight controls.
    3. The FO will speak: "WAITING TO FOLLOW YOUR RUDDERS".
    4. Move the rudder full left.
    5. The move the rudder full right
    6. Then return the rudder to neutral.

- Passenger version only: Speak: "SIGNAL THE CABIN CREW (PLEASE)" when ready. That is the trigger for the FS2Crew mode to automatically change to BEFORE TAKEOFF.

APPROACHING RUNWAY:

- After the cabin is secure, run the BEFORE TAKEOFF CHECKLIST. Command: "BEFORE TAKEOFF CHECKLIST TO THE LINE(PLEASE)". Note: FS2Crew cannot "read" due to SDK limits when the Cabin is Secure message is displayed on the intercom panel, so you'll just have to make do. Do not expect an announcement from the FO about the cabin being secure.
- If the flaps were left up for taxi because the taxiway was heavily contaminated, extend them prior to calling for the checklist. Command: "FLAPS 10" or "FLAPS 20".

BEFORE TAKE OFF CHECKLIST TO THE LINE (PLEASE)

FLAPS (C)	10 GREEN / 20 GREEN
FLIGHT CONTROLS (F)	CHECKED
STAB TRIM (F)	SET*
DEPARTURE DATA & CLEARANCE (B)	CONFIRMED NO FLAGS
CABIN (F)	READY

- Note: Due to SDK limits, FS2Crew cannot accurately "read" the position of the Stab Trim handle. FS2Crew will round the Stab Trim value up or down when reading its position.
- If you need to cross any runways, you may speak: "CONFIRM CLEARED TO CROSS RUNWAY XXX / CONFIRM CLEARED TO ENTER RUNWAY XXX"

RUNWAY ENTRY PROCEDURE AND TAKEOFF:

- Speak: "RUNWAY ENTRY PROCEDURE / LINE UP ITEMS / BEFORE TAKEOFF PROCEDURE/ CLEAR TO BACK TRACK"
- Speak: "CLEAR LEFT / CLEAR ON THE APPROACH".

BEFORE TAKEOFF PROCEDURE
-PILOT FLYING

- *WEATHER RADAR, VSD, TERRAIN AS DESIRED*
- *TRAFFIC ON ND*

BEFORE TAKEOFF PROCEDURE
-PILOT MONITORING

- *STROBES ON*
- *INBOARD LANDING LIGHTS ON*
- *TRANSPONDER TARA*
- *TERRAIN ON*
- *IF APU TO PACKS TAKEOFF: PACKS 1 AND 3 OFF*
- *IF PACKS OFF TAKEOFF: ALL PACKS OFF*

- After the Before Takeoff procedure is complete, run the Before Takeoff Checklist below the line.

BEFORE TAKE OFF CHECKLIST BELOW THE LINE (PLEASE)
LIGHTS STROBES (F)   ON
WX RADAR TERRAIN (F)   SET

- Speak "TAKEOFF" after cleared by ATC for takeoff.
- The PM will then set the OUTBOARD LANDING LIGHTS to ON and start timing.
- Advance the thrust levers to 50%, wait for the engines to stabilize, then press TOGA.
- At this point, the FMAs should be called out. The PM will reply "**CHECKED**". Do not make any more FMA callouts until 400 feet.
- PM will call "**POWER SET**" and "**80 KNOTS**".
- When the PM calls 80 Knots, speak "CHECKED" to confirm you are not incapacitated and that the ASI's agree.
- The PM will call "**V1**" if V1 is not selected an aircraft auto-callout.
- When the PM calls "**ROTATE**", pitch the nose up.
- After the PM calls "**POSITIVE RATE**", speak: "GEAR UP".
- Note: The PM will not announce "GEAR UP" because it's Boeing practice not to say anything between V1 and 400 feet except for "ROTATE" and 'POSITIVE RATE", even if you have a failure. At 400 feet, you should also start announcing FMA changes again.

REJECTED TAKEOFFS

- If Speak: "STOP STOP".
- If you want to return to the runway, speak: "LETS TAXI BACK TO THE RUNWAY".
- If desired, you make the following voice commands should an evacuation be required: "THIS IS THE CAPTAIN EVACUATE EVACUATE EVACUATE" or simply "EVACUATE EVACUATE EVACUATE".
- You may also wish to make PAs from the **PA - QRH** screen in the SECONDARY PANEL depending on the context.

VOICE CONTROL REMINDERS!

If you ever get stuck on a checklist item, speak: "SET AND CHECKED" to advance to the next item.

If an autopilot value does not stop when it should, speak "CANCEL LAST COMMAND".

SOME SIMPLE RULES AND ADVICE:

- In FS2Crew, you are the Captain and the Pilot Flying (PF). The computer is the FO and the Pilot Monitoring (PM).
- If the Autopilot is ON, the MCP (autopilot panel) falls within your area of responsibility. The FO/PM should generally never touch the MCP if the autopilot is on.
- It's highly recommended that you leave the Green Bar on so you can see what the speech recognition system is detecting.

CLIMB:

- If LNAV was not armed on the ground, engage a lateral mode at 400 feet. If the autopilot is on, press LNAV yourself since the MCP is the Pilot Flying's area of responsibility with the autopilot on. If the autopilot is off, speak: "ENGAGE LNAV / ENGAGE HEADING SELECT / SELECT HEADING SELECT".
- If not using VNAV and the autopilot is off, command: "SET SPEED XXX" passing the acceleration altitude. You could also command "BUG UP". The PM will then set the commanded speed in the airspeed window. However, if the autopilot is on, then you control the autopilot panel and you would set the desired speed manually. Note that in real-life, you would almost always use VNAV.
- Retract the flaps on schedule using the following commands (assuming takeoff was done at Flaps 20): "FLAPS 10", "FLAPS 5 / FLAPS 1 / FLAPS UP".
- If a PACKS OFF takeoff was performed, the PM will restore the packs 2000 feet above the takeoff elevation.
- The PM will set the Gear Handle to off with the Flaps 5 call.
- The PM will turn off the outboard landing lights, taxi light and runway turnoff light after selecting Flaps Up.

- When ready, ask the FO to engage the autopilot by speaking "SELECT LEFT AUTOPILOT COMMAND" or "SELECT LEFT AUTOPILOT IN COMMAND". You would then confirm the FMA mode change: "COMMAND GREEN".
- Speak "AFTER TAKEOFF CHECKLIST (PLEASE)"

AFTER TAKEOFF CHECKLIST (PLEASE)

LANDING GEAR (PM)	UP
FLAPS (PM)	UP
ANTI-ICE (PM)	SET

- The PM will perform entire checklist on his own.
- In real-life, the Pilot Flying (that's you!) would usually turn on the autopilot himself, but if you want the PM to turn on the autopilot you may use this voice command: "LEFT AUTOPILOT COMMAND (PLEASE)".
- If VNAV was not armed on the ground, engage VNAV when desired. If the autopilot is on, press VNAV on the MCP panel. If the autopilot is off, ask the FO to engage VNAV: "ENGAGE VNAV".
- At 10,000 feet, the PM will turn off inboard landing lights and the logo light.
- Shortly after passing 10,000 feet above the departure airport elevation, the PM will ask you if you want to release the cabin (Pax version only). Speak: "YES / YES PLEASE / OKAY / GO FOR IT / NO". Note: You have a 10 second window to respond.
- Every 10,000 feet you should announce: "FLIGHT LEVEL XXX CLIMBING". Or if in the descent: "FLIGHT LEVEL XXX DESCENDING."
- Passing Flight Level 290, check that the two main altimeters are within 200 feet of each other. Speak "WE ARE OKAY FOR R V S M". (You should also do this check at the Top of the Climb and every hour in cruise you are above FL290).

TRANSITION ALTITUDE:

When cleared above the Transition Altitude, or when passing the Transition Altitude, you have two possible options:

Option 1:

1. Press STD on your EFIS Panel.
2. Command: "SET STANDARD".
3. PM replies "STANDARD SET".
4. This is why it's important to have the CAPT and FO's Altimeters set to SYNC in the PMDG options. If they are not set to SYNC, the FO will not set STD on his side.

Option 2:

1. Press STD on your EFIS Panel.
2. Command: "ALTIMETERS TRANSITION SET STANDARD".
3. PM replies: "STANDARD SET CROSSCHECKED PASSING FLIGHT LEVEL XXX. CLIMBING FLIGHT LEVEL XXX".
4. Respond: "STANDARD SET AND CROSS CHECKED".

WORKING WITH THE FMC:

If making a change in the FMC, prior to pressing the EXEC button, speak: "CONFIRM EXECUTE". The PM will reply "**CONFIRM**". You can then press the EXEC button.

CREW COORDINATION TIPS:

With the autopilot on, only you as the PF should touch the autopilot panel. However, if you change an autopilot value, you should inform the PM as part of good Crew Resource Management. If, for example, you manually set Speed 250 in the Speed window, you can speak: "SPEED 250". The PM will respond: "**CHECKED**".

FUEL PUMP (EICAS MESSAGE):

If you receive an EICAS message related to fuel pumps, the procedure is to announce the EICAS message. The PM will then silently configure the fuel pumps. Note: For the Center pumps you do not need to specify the exact pump (left or right).

Allowed EICAS announcements:

"FUEL TANK TO ENGINE"

"FUEL LOW CENTER"

"FUEL OVERRIDE CENTER"

"FUEL PUMP STABLIZER (LEFT /RIGHT)"

"FUEL LOW STABALIZER (LEFT / RIGHT)"

CRUISE:

▪ If using voice control, it's recommended that you engage Hard Mute until you are ready to make a voice command.

DESCENT PROCEDURE

▪ Approximately 150 miles back of the Top of Descent, pass control to the First Officer. Speak: "YOU HAVE CONTROL". Next, perform your Descent Procedure.

DESCENT PROCEDURE
-PILOT FLYING

- PASS CONTROL TO THE FIRST OFFICER. "YOU HAVE CONTROL".
- REVIEW ALL MESSAGES
- COMPLETE MAP INTEGRITY CHECK
- SET STANDBY ALTIMETER TO DESTINATION FIELD QNH.
- WHEN CLEARED TO DESCEND, SET CLEARANCE LIMIT ALTITUDE ON MCP.

- *ENTER/MODIFY ARRIVAL ROUTE IN FMC*
- *CHECK LANDING PERFORMANCE*
- *SET AUTOBRAKE*
- *SET VREF (FLAPS 30 IN NORMAL)*
- *MAKE DESIRED SELECTIONS ON THE FS2CREW APPROACH BRIEF PAGE, BUT DO NOT RUN THE BRIEF YET.*
- *SET MINS SELECTOR (RADIO IF CATII or III OTHERWISE SELECT BARO)*
- *SET DECISION ALTITUDE/HEIGHT AND SELECT APP/BCRS ON STANDBY/ISFD.*
- *VERIFY OR SET THE TRANSITION LEVEL ON THE FMC'S DESCENT FORECASE PAGE. FS2CREW NEEDS THAT VALUE TO COMPUTE THE PM'S 'TRANSITION' CALL.*
- *RETAKE CONTROL FROM THE FIRST OFFICER. "I HAVE CONTROL".*
- *SPEAK: "DESCENT PROCEDURE".*

DESCENT PROCEDURE
-PILOT MONITORING

- *RECALL*
- *SET DA/DH ON FO'S EFIST PANEL (NOT SIMULATED DUE TO SDK LIMITS)*
- *CROSS CHECK VREF AND MCP SELECTIONS.*

- After the PM has completed his descent flow, brief for the Approach by pressing the **PLAY BRIEF** button on the Approach Brief page.
- As an option, you can speak: "ARE YOU READY FOR THE APPROACH BRIEF?" You must then close the brief by speaking: "ANY QUESTIONS".

DESCENT APPROACH CHECKLIST

- Run the Descent Approach checklist prior to the Top of Descent.
- Speak: "DESCENT APPROACH CHECKLIST (PLEASE)". (NOTE: That is the correct checklist name).
- The PM will complete the checklist to TRANSITION.

DESCENT APPROACH CHECKLIST (PLEASE)

RECALL (B)	CHECKED
SAFETY ALTITUDE (B)	CHECKED
MINIMA (B)	SET*
VREF (B)	SET
AUTOBRAKE (PM)	SET
PASSENGER SIGNS (PM)	ON/AUTO
MAP INTEGRITY (B)	CHECKED

-----TRANSITION-----

*For MINIMA, trigger phrase can also be XXXX FEET (IE, TWO ZERO ZERO FEET)
*For VREF, trigger phrase can also be XXX KNOTS (IE, ONE TWO ZERO KNOTS)

TRANSITION LEVEL:

- When cleared to an altitude:

1. Speak: "ALTIMETERS TRANSITION SET QNH" / "ALTIMETERS TRANSITION SET ALTIMETERS".
2. PM: "XXXX SET CROSSCHECKED. PASSING XXXX. DESCENDING XXXX"
3. PF: "XXXX SET AND CROSSCHECKED"
4. PM: "DESCENT APPROACH CHECKLIST COMPLETE".

APPROACH:

- Passing 20,000 feet, the PM will set the seatbelt signs to on.
- Passing 10,000 feet, the PM will turn on the following exterior lights: Inboard landing, taxi and runway turnoff. If it's night, the PM will turn on the logo light.
- Every 10,000 feet, speak: "DESCENDING FLIGHT LEVEL XXX"
- At approximately 5000 feet above the arrival airport, PM will rotate the NO SMOKING SIGN to verify the cabin is ready for landing.
- At 5000, feet speak: "ALTIMETERS". PM will reply: "LAST 5000".
- At 2500 feet, speak: "AIRFIELD QNH XXXX SET AND CROSSCHECKED".

SHOOTING THE APPROACH:

- Use HDG SEL or LNAV to intercept the final approach course. If using LNAV, ensure the localizer is captured as it might parallel the approach course.
- Arm APP Mode if required.
- Extend the flaps on schedule: "FLAPS 1", "FLAPS 10", FLAPS 20", "FLAPS 25", "FLAPS 30".

TRANSITITIONING TO A VISUAL APPROACH:

If you can see the runway and you wish to continue visually, speak: "VISUAL". That will change the Approach Type to Visual. Then speak: "CANCEL THE BAROS/ RESET THE BAROS". You should then press the RST button on your MINS selector. The PM will stop making callouts relevant to the instrument approach. Note: On a Visual and sometimes on a VNAV/IAN approach (especially in hot conditions), you should call "CYCLE FLIGHT DIRECTORS" or "RECYCLE THE FLIGHT DIRECTORS" after the autopilot is disengaged.

- Depending on your selected Config call out options, the PM will call "**LOCALIZER ALIVE**" and "**GLIDESLOPE ALIVE**". Speak "CHECKED". Note: Due to limits in reading data out of FS, the Localizer and Glideslope alive calls may not always be accurate. You can disable these calls if desired. Note: the airline SOP 2 is based on does not make the LOC or GLIDESLOPE ALIVE calls, so you may wish to disable this option. Instead the PF calls the FMA mode change.
- When the Glideslope comes alive, speak: "GEAR DOWN FLAPS 20". Arm the speed brake.
- When desired, speak: "FLAPS 25/30".
- Assuming the autopilot is on, manually set the Missed Approach Altitude in the MCP at Glideslope Capture. If the autopilot is off, command the PM to set the Missed Approach Altitude. Speak: "SET MISSED APPROACH ALTITUDE XXX".
- If autopilot not engaged, speak: "SET VREF PLUS ___"

- If autopilot engaged, manually set VREF plus additive.
- Passing the Outer Marker or FAF, speak: "FINAL FIX".
- After the final landing flap has been selected, speak: "LANDING CHECKLIST".

LANDING CHECKLIST (PLEASE)

SPEEDBRAKE (PF)	ARMED
LANDING GEAR (B)	DOWN
CABIN (PM)	READY
MISSED APPROACH ALTITUDE (PM)	SET
FLAPS (PF)	25 GREEN / 30 GREEN

- At 500 feet, the PM will call stable or not stable.
- If autopilot engaged, manually set VREF plus additive.
- Speak: "CLEARED TO LAND" when cleared to land. That is the PM's trigger to turn on the outboard landing lights.
- At minimums, speak: "LAND" or "CONTINUE". If you need to go around, follow the Go Around procedure described below.

GO AROUND PROCEDURES

- Push the TO/GA switch
- Speak: "GO AROUND / GO AROUND FLAPS 20".
- After the PM announces "**POSITIVE RATE**", speak: "GEAR UP".
- The PM will set the landing gear up.
- At or above 400', select or call for a lateral roll mode.
- At the acceleration altitude, speak: "SET FLAPS UP SPEED" if VNAV is not engaged.
- Retract the flaps on schedule and call for the "AFTER TAKEOFF CHECKLIST".

ROLLOUT

- The PM will announce the status of the speed brakes and reversers. "**SPEED BRAKE UP/ NOT UP/ REVERSERS NORMAL".**
- The PM will call "**60 KNOTS**".
- Call "MANUAL BRAKING" when applying manual braking.
- If doing an Autoland, disengaging the autopilot/auto throttle is the responsibility of the Pilot Flying.

AFTER LANDING

To trigger the FO's after landing flow, speak "OKAY TO CLEAN UP" / "CLEAR OF THE RUNWAY" / "AFTER LANDING PROCEDURE" / "AFTER LANDING ACTIONS". A Config Option is available to use the position of the speed brake as a trigger for the FO's after landing flow.

AFTER LANDING PROCEDURE
-CAPTAIN

- *SPEED BRAKE DOWN*
- *WX RADAR OFF*

AFTER LANDING PROCEDURE
-FIRST OFFICER

- *APU: IF GPU/AC NOT PRESELECTED TO BE CONNECTED AT THE GATE, ASK CAPTAIN IF HE/SHE WANTS THE APU ON. SPEAK: "YES" OR "NO" or "LATER".*
- *EXTERIOR LIGHTS AS REQUIRED*
- *TERRAIN OFF (NOTE: DUE TO SDK LIMITS, FS2CREW CANNOT READ IF TERRAIN IS ACTIVE. THAT SAID, THE FO PUSHES THE TERR BUTTON ASSUMING ITS ALREADY ON)*
- *SPEED BRAKE LEVER DOWN*
- *FLAPS UP IF TAXIWAYS NOT CONTAMINATED*
- *IF TAXIWAYS CONTAMINATED, FO WILL ASK YOU IF YOU WANT TO LEAVE THE FLAPS DOWN. SPEAK: "YES" OR "NO"*
- *STAB TRIM TO 6 UNITS*
- *TRANSPONDER AS REQUIRED*

- Speak: "CLEAR LEFT / CLEAR ON THE LEFT" if crossing another runway.
- When the After Landing Procedure is complete, run the AFTER LANDING CHECKLIST.

AFTER LANDING CHECKLIST (PLEASE)

FUEL XFER MAIN 1 AND 4 (F)	SET
LIGHTS AND STROBES (F)	OFF
WEATHER RADAR (F)	OFF
FLAPS (F)	SET
SPEEDBRAKES (F)	DOWN
STAB TRIM (F)	6 UNITS
APU (F)	SET

*FS2Crew cannot read the actual position of the Weather Radar due to SDK limits, so it's assumed it's correctly in the off position.

TAXI IN

- If you require APU power, and if you did not tell the FO to turn on the APU during the AFTER LANDING PROCEDURE, speak "TURN ON THE APU / START THE APU" when desired. Turn it on as late as possible to save fuel.
- Just prior to turning into the gate or stand, speak: "LIGHTS AND DOORS". The FO will turn off the taxi, runway turnoff lights and inboard landing lights as appropriate and make the following PA: "**CABIN CREW DISARM DOORS AND CROSSCHECK**." It is also the trigger for the doors to be disarmed.
- If using the Freighter, just speak: "LIGHTS" or "LIGHTS PLEASE" since there is no FA to disarm the doors.

TAXI IN WITHOUT ALL 4 ENGINES RUNNING:

- If you wish to shut down an engine (or engines) during taxi to save fuel, speak one of the following commands: "SHUTDOWN ENGINES 2 AND 3" / "SHUTDOWN ENGINE 3".

GATE/STAND ARRIVAL SHUTDOWN

SHUTDOWN PROCEDURE (PRIOR TO ENGINE CUT)
-CAPTAIN

- *PARKING BRAKE SET*
- *TRANSPONDER TO A1000/ STBY*
- *IF YOU ASKED THE FO TO TURN ON THE APU AFTER LANDING, WAIT FOR THE FO TO ANNOUNCE THAT THE APU IS "ON-LINE" PRIOR TO RUNNING THE SHUTDOWN PROCEDURE.*
- *COMMAND: "SHUTDOWN PROCEDURE / SHUTDOWN PROCEDURE PLEASE". THAT IS THE TRIGGER FOR THE FO TO START HIS FLOW DESCRIBED BELOW.*
- *AFTER THE FO ANNOUNCES "CLEAR TO CUT" OR "CLEAR TO SHUTDOWN", SET ENGINE START LEVERS CUTOFF.*

  NOTE: IF FOR SOME REASON THE APU IS INOP, LEAVE ENGINE #4 RUNNING UNTIL EXTERNAL POWER CAN BE CONNECTED. MAKE SURE YOU HAVE A POWER SOURCE CONNECTED BEFORE SHUTTING DOWN THE ENGINES!

SHUTDOWN PROCEDURE (PRIOR TO ENGINE CUT)
-FIRST OFFICER

- *APU / GPU ON THE BUSSES (IF APU or GPU AVAILABLE)*
- *HYD DEMAND PUMPS OFF (4 TO AUX)*
- *STATUS DISPLAY TO ENGINE*
- *ANNOUNCE READY FOR ENGINE SHUTDOWN*

SHUTDOWN PROCEDURE (AFTER ENGINE CUT)
-CAPTAIN

- *WHEN CHOCKS IN PLACE, ANNOUNCE: "CHOCKS HOLDING". THIS IS THE TRIGGER FOR THE FO TO SET HYD PUMP 4 TO OFF*
- *CAPT'S FLIGHT DIRECTOR OFF*
- *SEATBELT SIGN OFF*

SHUTDOWN PROCEDURE (AFTER ENGINE CUT)
-FIRST OFFICER
- *ANTI ICE OFF*
- *FUEL PUMP SWITCHES OFF*
- *AFT CARGO HEAT SWITCH OFF*
- *PACKS SET*
- *BEACON OFF (IF ON APU POWER, THE GROUND CREW WILL INSERT THE CHOCKS AFTER THE BEACON IS SELECTED OFF)*
- *FO'S FLIGHT DIRECTOR OFF*
- *RESET MCP AND XPONDER (CONFIG OPTION)*
- *HYD PUMP 4 TO OFF IF CHOCKS IN PLACE*
- *APU OFF IF EXTERNAL POWER CONNECTED*

When the shutdown procedure is complete, call for the SHUTDOWN CHECKLIST. Speak: "SHUTDOWN CHECKLIST".

SHUTDOWN CHECKLIST (PLEASE)

PARKING BRAKE (C)	SET
TRANSPONDER (C)	A 1000 AND STANDBY
EXT/APU POWER (C)	ESTABLISHED
DEMAND PUMPS (C)	OFF / OFF AND AUXILARY
FUEL CONTROL SWITCHES (C)	CUTOFF
PASSENGER SIGNS (C)	OFF
FUEL PUMPS (C)	OFF
ANTI-ICE (C)	OFF
BEACON (C)	OFF

Note: If you want to make a second flight, you do NOT need to reload the aircraft. Instead, press the down arrow button on the FS2Crew Main Panel and skip over the SECURE CHECKLIST. You will be returned to the PRE-FLIGHT CHECKLIST. Alternatively, you can speak: "OKAY ON TO THE NEXT SECTOR" while in SECURE mode. The Pre-Flight events will automatically run.

SECURING THE AIRCRAFT

If you wish to secure the aircraft, use the following procedure, but note that in real-world flying, pilots very rarely run this procedure. It's usually done by engineering.

Important note: If you do NOT have **FINAL SECTOR** set to **YES** on the **2nd page of the Approach Briefing** page, FS2Crew will automatically skip the secure section and return you to the first checklist.

- Speak: "SECURE PROCEDURE".
- When the FO completes his flow, speak: "SECURE CHECKLIST".

SECURE PROCEDURE
-FIRST OFFICER
- *IRS'S OFF*
- *EMERGENCY EXIT LIGHTS OFF*
- *AFT CARGO HEAT OFF*
- *PACKS OFF*

SECURE CHECKLIST (PLEASE)

IRSs (C)	OFF
PARKING BRAKE (C)	SET / RELEASED
DEMAND PUMP 4 (C)	OFF
EMERGENCY EXIT LIGHTS (C)	OFF
AFT CARGO HEAT (C)	OFF
PACKS (C)	OFF / SET
EXT/APU POWER (C)	OFF / SET
APU (C)	OFF / ON
STANDBY POWER (C)	OFF / ON
BATTERY (C)	OFF / ON
TECH LOG (C)	COMPLETED
FLIGHT DECK ACCESS SYSTEM SWITCH (C)	OFF
FUEL XFER MAIN 1 AND 4 (C)	OFF

-TUTORIAL END-