iniBuilds

# Beluga XL
# MANUAL

Microsoft Flight Simulator

# Preface

FOR SIMULATION USE ONLY - DESIGNED FOR SINGLE-PILOT OPERATIONS

This guide is designed to help provide a straightforward set of instructions to aid in operating the Airbus A330 Beluga XL aircraft. It has been produced using multiple real-world Airbus A330 Beluga XL operator manuals from various dates and sources with modifications to various procedures to make them more manageable under single-pilot operations.

PHOTOSENSITIVE SEIZURE WARNING

A very small percentage of people may experience a seizure when exposed to certain visual images, including flashing lights or patterns that may appear in video games. Even people who have no history of seizures or epilepsy may have an undiagnosed condition that can cause these "photosensitive epileptic seizures" while playing video games.

Immediately stop playing and consult a doctor if you experience any symptoms.

These seizures may have a variety of symptoms, including light-headedness, altered vision, eye or face twitching, jerking, or shaking of arms or legs, disorientation, confusion, or momentary loss of awareness. Seizures may also cause loss of consciousness or convulsions that can lead to injury from falling down or striking nearby objects.

Parents should watch for or ask their children about the above symptoms. Children and teenagers are more likely than adults to experience these seizures.

You may reduce risk of photosensitive epileptic seizures by taking the following precautions:

- Play in a well-lit room.
- Do not play if you are drowsy or fatigued.

If you or any of your relatives have a history of seizures or epilepsy, consult a doctor before playing video games.

# Copyright



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# About the Airbus A330 Beluga XL

The BelugaXL is a specialized high-volume cargo aircraft developed by European aviation consortium Airbus. The distinctive, twin-engine BelugaXL is an integral logistical element in the manufacturing process at Airbus. It is used to transport key aircraft components, notably wing assemblies, fuselage sections, and tail units, between production facilities located throughout Europe. It is also used for non-Airbus global outsize freight service. The BelugaXL took its maiden flight on July 19, 2018 and it entered service on January 9, 2020. Airbus has manufactured a total of six BelugaXLs.

The BelugaXL was developed specifically to serve the unique logistical needs of the Airbus distributed manufacturing process. The company, founded in 1970 through the merger of several European aviation firms, produces aircraft components across several countries. This manufacturing arrangement requires the transnational transport of large substructures for final assembly, including wings built in the United Kingdom and tail units built in Spain. Airbus initially relied exclusively on surface logistics including barge, rail, road, and ship transport.

Increased demand in the years following their founding led Airbus to create a high-volume air transporter based on their A300-600 wide-body airliner, the BelugaST ("Super Transporter"). To build the BelugaST, the company dramatically enlarged the A300-600's fuselage to accommodate the transport of wings, tail sections, and fuselage components. Airbus also re-engineered the empennage to account for the aerodynamic changes engendered by the enlarged fuselage, among a host of other modifications. Formally designated the A300-600ST, the aircraft was named "Beluga" due to its resemblance to the beluga whale. It took its maiden flight on September 13, 1994, and was introduced in September 1995. Airbus built a fleet of five Beluga Super Transporters, and their integration has proven critical to the uninterrupted manufacturing flow of the company's large line of commercial aircraft.

In 2014, Airbus embarked on a program to replace the venerable BelugaST with an even larger, more efficient transporter, the BelugaXL. Formally designated the A330-743L, the BelugaXL ("Extra Large") is based on the company's A330 freighter. The BelugaXL is similar in appearance to the BelugaST, but is larger, including having 30 percent more cargo volume than its progenitor. While the original Beluga can carry one A350 XWB wing, the BelugaXL can carry two. Airbus has built a total of six BelugaXLs, each with its own distinct livery. Operationally, the new transporter series complements the capability of the original Beluga fleet and will eventually replace it.

The BelugaXL has a fuselage with a bulbous cross-section profile that has a volume of 78,000 cubic feet (compared to the BelugaST's 53,000 cubic feet). The fuselage comprises a nose door that opens upward and a drooped cockpit section, allowing the unimpeded loading of cargo. Like the BelugaST, the BelugaXT has an empennage tailored to the unique aerodynamic requirements of a large fuselage aircraft. It has an enlarged vertical stabilizer and two auxiliary vertical stabilizers at each end of its horizontal stabilizer to ensure yaw authority.

The BelugaXL measures 207 feet in length, stands 62 feet tall, and has a wingspan of 197 feet, 10 inches. It is powered by two wing-mounted Rolls-Royce Trent 700 high-bypass turbofan engines that each deliver up to 71,000 pounds of thrust. The BelugaXL has a range of 2,532 miles while loaded with its maximum payload of 111,333 pounds. It has a service ceiling of 35,000 feet above sea level and a top speed of 458 miles per hour.



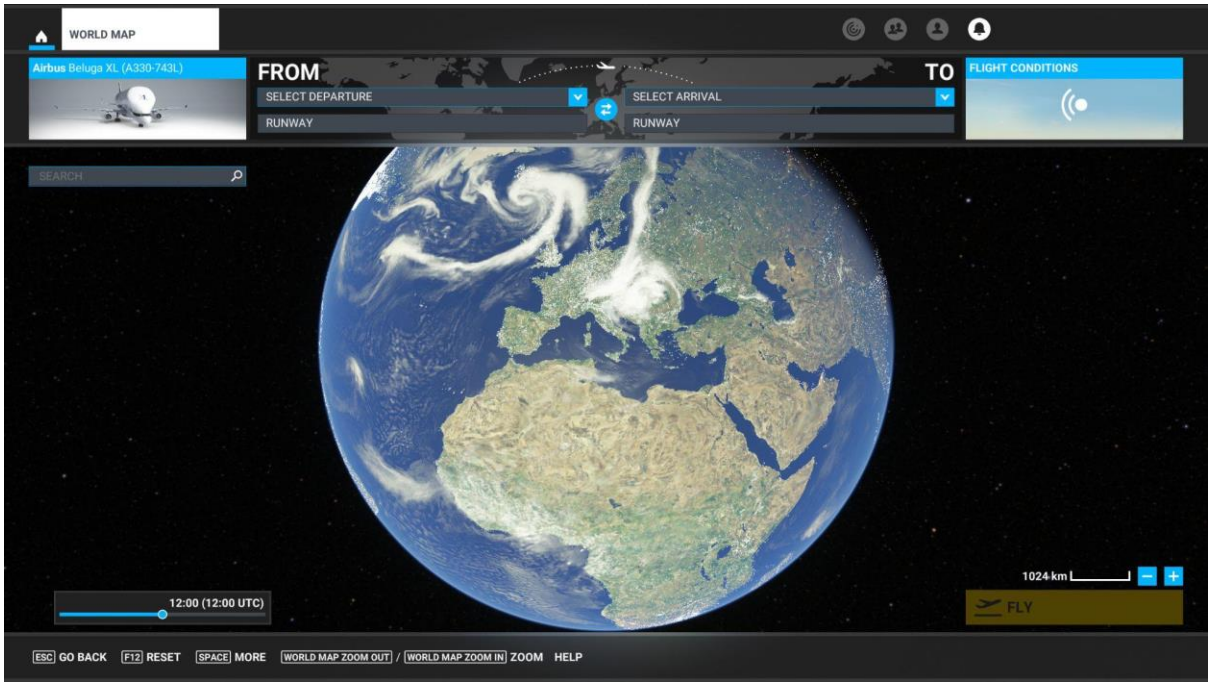
Operationally, the BelugaXL typically serves eleven Airbus manufacturing sites in its primary mission of intra-company manufacturing support. It also supports non-Airbus outsize cargo applications, including the intercontinental transport of satellites.

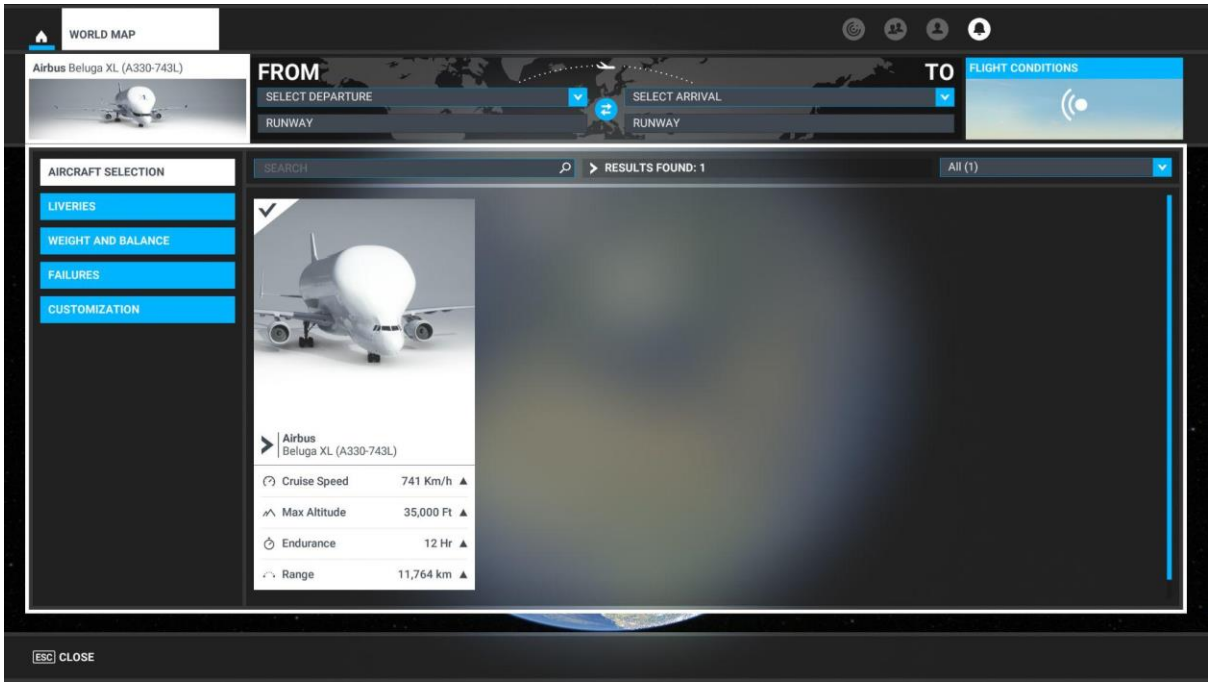
The BelugaXL is piloted by two and boasts an advanced cockpit with state-of-the-art avionics and flight systems adapted from other cutting-edge Airbus aircraft. These include fly-by-wire flight controls, large color multi-function displays, and systems for the optimization of pilot situational awareness of aircraft systems, environmental factors, and air traffic.

# Aircraft Selection and Liveries

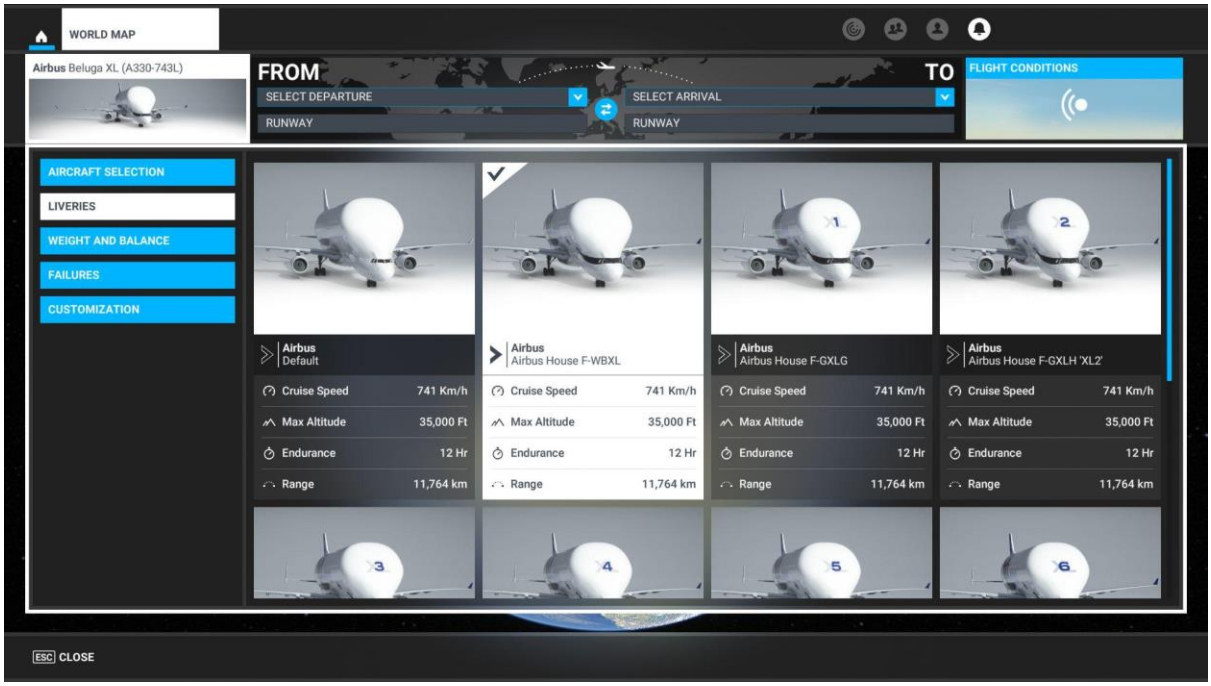
To fly the Airbus Beluga XL, you will need to select it from the Aircraft Selection menu.
Click on WORLD MAP in the Main Menu and click the AIRCRAFT SELECTION icon on the top left.

Scroll until you see the Airbus Beluga XL or type "Airbus Beluga XL" in the search bar, and select the aircraft.



Click on Liveries to select any of the various designs available for the Airbus A330 Beluga XL.



# Cockpit Interaction

Some knobs within the cockpit have interaction where you can push, pull, or scroll them for their functionality.

This functionality will vary depending on your simulator's specific settings under GENERAL OPTIONS > ACCESSIBILITY.

If a control is set to "Lock," left click (and hold the left mouse button) the knob and push the mouse for "push" interaction and pull the mouse for "pull" interaction. Some functions also may have a middle-mouse button "scroll" or "push" and right-mouse click "set" functions.

If it is set to "Legacy," you will see an icon appear to the left, right, above, or below, which you use the middle-mouse wheel to scroll as if a circular arrow, and left click to "set" as if an up or down arrow icon.

On the Xbox, press **A** to interact with the knob and use **A** to "push," **X** to "pull," Right Stick to "scroll," and **B** to finish the control input.


# Checklists

While this guide offers comprehensive operational instructions that are functionally complemented by the Quick Reference Card (QRC), iniBuilds has incorporated expedient procedural checklists within the simulator. These can be accessed via the top-of-screen drop-down menu by selecting the Checklist option.


Some items within the in-sim checklist have a drop down for sub-functions, simply click the blue up arrow to open them.

Clicking the blue eye icon to the right of the checklist item will switch your view to the requisite panel where the button/switch/dial/gauge is located. You can use the AUTO COMPLETE option to expediently tick off the item from the checklist.

# Limitations

## Weight Limits

### Airframe Limits

| Limitation | KG | Lbs |
|---|---|---|
| Maximum Takeoff Weight (MTOW) | 227,000 | 500,449 |
| Maximum Landing Weight | 187,000 | 412,260 |
| Maximum Zero Fuel Weight (MZFW) | 178,000 | 392,418 |
| Operating Empty Weight (OEW / DOW) | 127,500 | 281,089 |

Under exceptional conditions, an immediate landing is permitted at any weight below MTOW provided the overweight landing procedure is followed. NOTE: Autoland above MLW has not been demonstrated.

### Payload Limits

| Limitation | KG | Lbs |
|---|---|---|
| Maximum Fuel Quantity | 73,300 | 161,598 |
| Maximum Passenger Weight | 1,020 | 2,244 |
| Maximum Cargo Hold Weight | 50,500 | 111,333 |

## Speeds & Performance Limits

### Minimum Control Speeds

| | | |
|---|---|---|
| Minimum Control Speed on Ground (VMCG) | 108 KTS IAS | 121 KTS IAS |
| Minimum Control Speed in Air (VMCA) | 103 KTS IAS | 122 KTS IAS |

### Maximum Slats/Flaps Speeds (VFE)

Note: Max FL for slats and flaps FL200

| Flight Phase | CONF | Slats | Flaps | Ailerons | Max Speed (IAS) |
|---|---|---|---|---|---|
| Approach | 1 | 16 | 0 | 0 | 240 KTS |
| Takeoff and Approach | 1+F | 16 | 8 | 5 | 215 KTS |
| Takeoff and Approach | 2 | 20 | 14 | 10 | 196 KTS |
| Takeoff, Approach and Landing | 3 | 23 | 22 | 10 | 186 KTS |
| Landing | FULL | 23 | 32 | 10 | 180 KTS |

### Gear Operating Speeds

| | | |
|---|---|---|
| Maximum Gear Operation Speed extension & retraction VLO | 250 KT | M 0.55 |
| Maximum Gear Locked Down Speed VLE | 250 KT | M 0.55 |

### Miscellaneous Speeds

| | |
|---|---|
| Maximum Tire Ground Speed | 204 KTS |
| Maximum Windshield Wiper Operation Speed | 230 KTS |
| Maximum Open Cockpit Window Speed | 230 KTS |

### Flight Maneuvering g-Load Limits

| | | |
|---|---|---|
| Clean Configuration | +2.5 g | -1 g |
| Slats Extended Configuration | +2 g | 0g |

### Airport Operation Limitations

| | |
|---|---|
| Mean Runway Slope | ± 2 % |
| Maximum Runway Altitude Non-Autoland | 7 000 ft AMSL |

### Wind Speed Limitations

| | |
|---|---|
| Maximum Tailwind Component (Takeoff and Landing) | 10 KTS |
| Maximum Certified Crosswind for Take Off (Dry Runway) | 27 KTS |
| Computed Demonstrated Crosswind for Landing | 27 KTS |
| Maximum Wind for Cargo Door Operation | 40 KTS |

### Autoland Limitations

| | |
|---|---|
| Maximum Headwind Component | 35 KTS |
| Maximum Crosswind Component | 20 KTS |
| Maximum Tailwind Component | 10 KTS |
| Maximum Altitude | 7 000 FT |
| Glide Slope | -2.5 to -3.25 degrees |

# Aircraft Configuration Summary

For awareness and for the specified aircraft model, the following table provides the user with a list of optional aircraft systems and functions related to aircraft flight operations.
The "If Installed Table" provides a list of optional systems and functions of the aircraft. The table indicates if the optional systems or functions are installed, or not installed.

| A330 Generic | | |
|---|---|---|
| **Item** | **System** | **Installed** |
| **2 ADFs** | **NAV** | **Yes** |
| **ADS-B OUT** | **SURV** | **Yes** |
| Air Flow Selector AUTO Function | COND | No |
| ALTN N/W STRG | GEAR | No |
| AP/FD TCAS | AUTO FLT | No |
| **AP Automatic Disconnection at Minima** | **AUTO FLT** | **Yes** |
| ATSAW | SURV | No |
| **Weather Hazard Prediction Function** | **SURV** | **Yes** |
| **Automatic FD Bar Engagement at Go-Around** | **AUTO FLT** | **Yes** |
| **Avionics Compartment Access Ladder** | **DOOR** | **Yes** |
| **BARO/RADIO OPTION** | **NAV** | **Yes** |
| Battery Discharge Warning | ELEC | No |
| **Brake Fans** | **BRAKE** | **Yes** |
| **Bulk Cargo Door** | **DOOR** | **Yes** |
| BUSS | NAV | No |
| **Chemical Oxygen System** | **OXY** | **Yes** |
| CIDS-SDF | SMOKE | No |
| Cockpit Door Deadbolt | EQUIPMENT | No |
| Cockpit Fixed Oxygen System External Filling Port | OXY | No |
| **Cockpit Foot Warmer** | **EQUIPMENT** | **Yes** |
| Cockpit Power Outlet | EQUIPMENT | No |
| Cockpit Side Electrical Heater | EQUIPMENT | No |
| CVR Datalink Function | COM | No |
| CVR ERASE Function | COM | No |
| CPDLC | DATALINK | No |
| **DDRMI** | **NAV** | **Yes** |
| **Derated Climb** | **ENG** | **Yes** |
| Derated Takeoff | ENG | No |
| Descent Profile Optimization (DPO) | AUTO FLT | No |
| Delta ISA | EIS | No |
| Door Aural Warning Horn | DOOR | No |
| DOOR SW OVRD | DOOR | No |
| **Dual Ice Detection System** | **ICE** | **Yes** |
| EGPWS | SURV | No |
| **ELT switch** | **COM** | **Yes** |
| Extended FLEX Takeoff | ENG | No |
| **External Ice Detector Light** | **ICE** | **Yes** |
| **EVAC COMMAND** | **COM** | **Yes** |
| ATC MSG | FANS | No |
| FLS Function in the FMS | AUTO FLT | No |
| **Honeywell FMS 2 Release 1A** | **AUTO FLT** | **Yes** |
| **FMS2 (including RF leg capability)** | **AUTO FLT** | **Yes** |
| GLS | AUTO FLT | No |
| **GPS** | **NAV** | **Yes** |
| **GPS PRIMARY Function** | **NAV** | **Yes** |
| HF Datalink | COM | No |
| HUD | SURV | No |
| **IRS Alignment Based on GPS Position** | **NAV** | **Yes** |

| **ISIS** | **NAV** | **Yes** |
|---|---|---|
| Jettison | FUEL | No |
| Landscape Camera | MISC | No |
| Man-made Obstacle Function | SURV | No |
| **MMR** | **NAV** | **Yes** |
| **NAV Mode Automatically Engaged (Armed) at Go-Around** | **AUTO FLT** | **Yes** |
| OEB Reminder | EIS | No |
| On-board Mobile Telephony System | COM | No |
| Optional Applications: DCL, OCL, D-ATIS | FANS | No |
| PAX SATCOM | COM | No |
| **PWS** | **SURV** | **Yes** |
| QFE BARO Setting | NAV | No |
| RAAS | SURV | No |
| Rain Repellent System | RAIN | No |
| Rising Runway Symbol | EIS | No |
| RMP Load Function | COM | No |
| ROW/ROPS | SURV | No |
| RCPU | CAB PR | No |
| RNP AR | AUTO FLT | No |
| ROW/ROPS | SURV | No |
| SATCOM | COM | No |
| SDCU | SMOKE | No |
| Soft Go-Around Function | ENG | No |
| **T2CAS** | **SURV** | **Yes** |
| Tail Strike Pitch Limit Indicator | EIS | No |
| Taxiing Aid Camera | MISC | No |
| Thrust Bump | ENG | No |
| **TPIS** | **WHEEL** | **Yes** |
| **Trim Tank Pump** | **FUEL** | **Yes** |

| **A330-743L** | | |
|---|---|---|
| **Item** | **System** | **Installed** |
| **Avionics Ground Cooling** | **COND** | **Yes** |
| Bulk Cargo Heating | VENT | No |

# Airbus Beluga XL Specifications

| | |
|---|---|
| **Cruise Speed** | 398 KTAS |
| **Max Altitude** | 35,000 ft |
| **Max Weight** | 227,000 kg (500,449 lb) |
| **Range** | 2,300 NM |
| **Fuel Capacity** | 88,302 L (23,326 gal) |
| **Length** | 63.12 m (207 ft 1 in) |
| **Wingspan** | 60.3 m (197 ft 10 in) |

# Important Notes About the Airbus Beluga XL

The physical Airbus A330 Beluga XL is typically operated by two pilots, however, iniBuilds has written the procedures for our simulated version for a single pilot.

Airbus aircraft are operated using several core concepts and design philosophies, explained below.

## Airbus Golden Rules

1) Fly, navigate and communicate:
   In this order with appropriate tasking
2) Use the appropriate level of automation at all times
3) Understand the Flight Mode Annunciator (FMA) at all times
4) Take action if events do not evolve as expected

## The FMA (Flight Mode Annunciator)

The FMA is one of the most critically important systems on Airbus aircraft as it provides information to the air crew on automated aircraft actions in real time and indicates what actions aircraft systems will undertake in the near future.

Where is the FMA located?
The boxed red area shows the **FMA**.


What do the colors mean?
**Blue** indicates **armed** and **Green** indicates **engaged**. In the image we can see CLB (Climb) mode is armed along with NAV (Lateral Navigation) mode.

The FMA indicates a condition change by displaying a colored box. To indicate a reverted mode, the box will flash, or it will flash accompanied by a triple clicking sound to draw pilot attention. An example follows of a box displayed when NAV has changed to HDG.


Each column on the FMA shows what the Autopilot (AP) or Auto Thrust (A/THR) is undertaking.


| | |
|---|---|
| **Orange = Autothrust operation** | Indicates the aircraft's thrust setting |
| **Red = Vertical mode** | Indicates the vertical mode the Flight Director and Autopilot are following |

| | |
|---|---|
| **Grey = Lateral mode** | Indicates the lateral mode the Flight Director and Autopilot are following |
| **Purple = Approach capability** | Indicates the Autopilot's current maximum approach capability. CAT 3 DUAL for example, is the equivalent of a CAT III (zero visibility) approach |
| **Pink = Autopilot, flight director and A/THR state** | Indicates the status of the currently engaged Autopilot and Flight Directors, as well as Autothrust engagement condition |

## Lights out concept

When configuring the aircraft during the cockpit setup phase, **all white lights should be selected off.** The normal in-flight configuration has no white lights shown at all.


Cockpit light color guide:

| | |
|---|---|
| **Blue = Temporary selection** | Some examples include auto brake selection, engine and wing anti-ice, APU, and External power. These are not |

| | |
|---|---|
| | normally selected for the entire flight, they are “temporarily” selected. |
| **Amber = Caution**<br>**Red = Warning** | To alert the pilot to abnormal and emergency conditions, the relevant system push button light will be highlighted. |

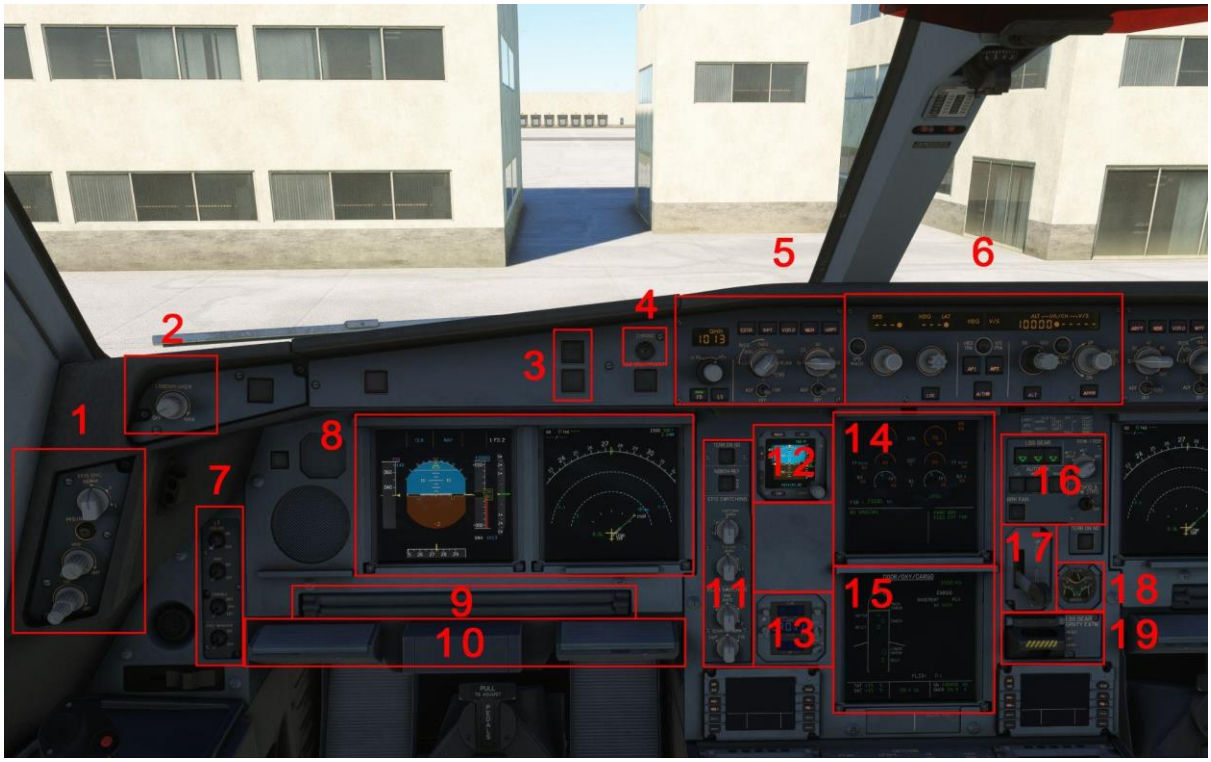
Note – on the ground, before engine start, some lights will indicate the **amber** abnormal status. This is normal.

## Fly by wire concept

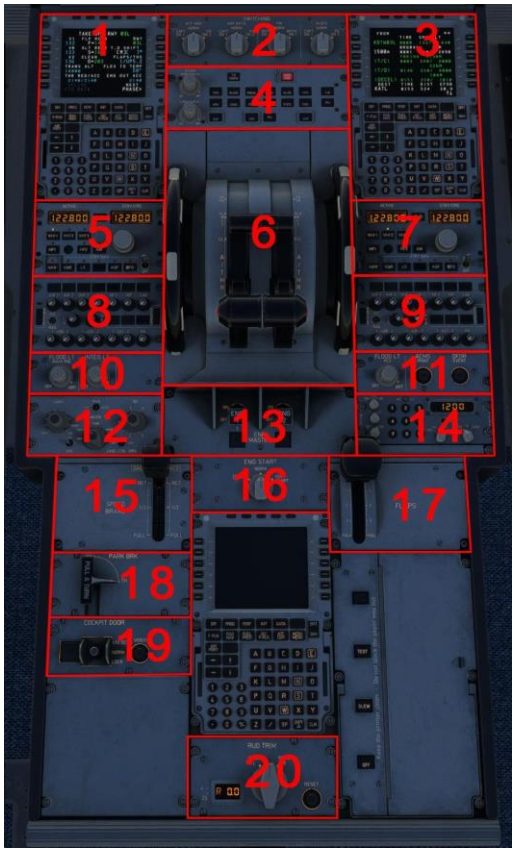
Modern Airbus aircraft are fitted with a sophisticated Fly-By-Wire (FBW) system.

The system is based on maintaining a specified G force (acceleration force). During normal, level flight, the FBW system will hold the force (1G – level, no bank turns, no acceleration) if the flight controls are released from manual actuation. Airbus FBW will not hold pitch or bank angles; it will hold the aircraft to a G force (regardless of pitch or bank) with auto trim and elevators.

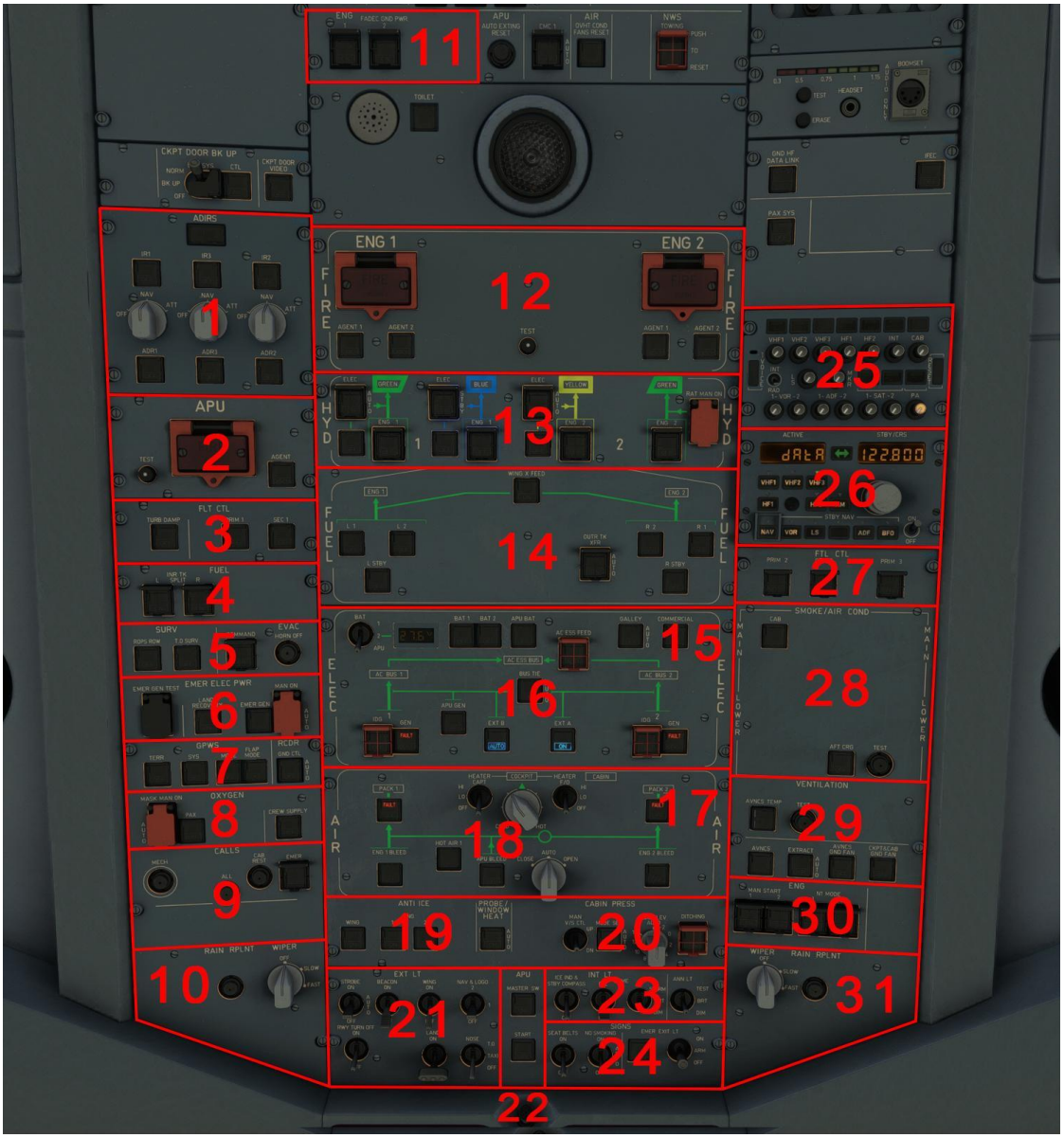
# Cockpit Layout




1. PFD & ND Brightness knobs
2. Loudspeaker knob
3. CPT Master Warning / Caution lights
4. Chronometer
5. CPT EFIS
6. Flight Control Unit (FCU)
7. CPT Lighting Panel
8. CPT Primary Flight Display (PFD) / Navigation Display (ND)
9. CPT Tray Table
10. CPT Footrest
11. CPT Terrain on ND & True reference selector
12. Integrated Standby Instrument System (ISIS)
13. Clock
14. Engine and Warning Display
15. System/Status Display
16. Gear Indicator / Auto Brake panel
17. Landing Gear Lever
18. Brakes and Accumulator pressure indicator
19. Landing gear gravity extension



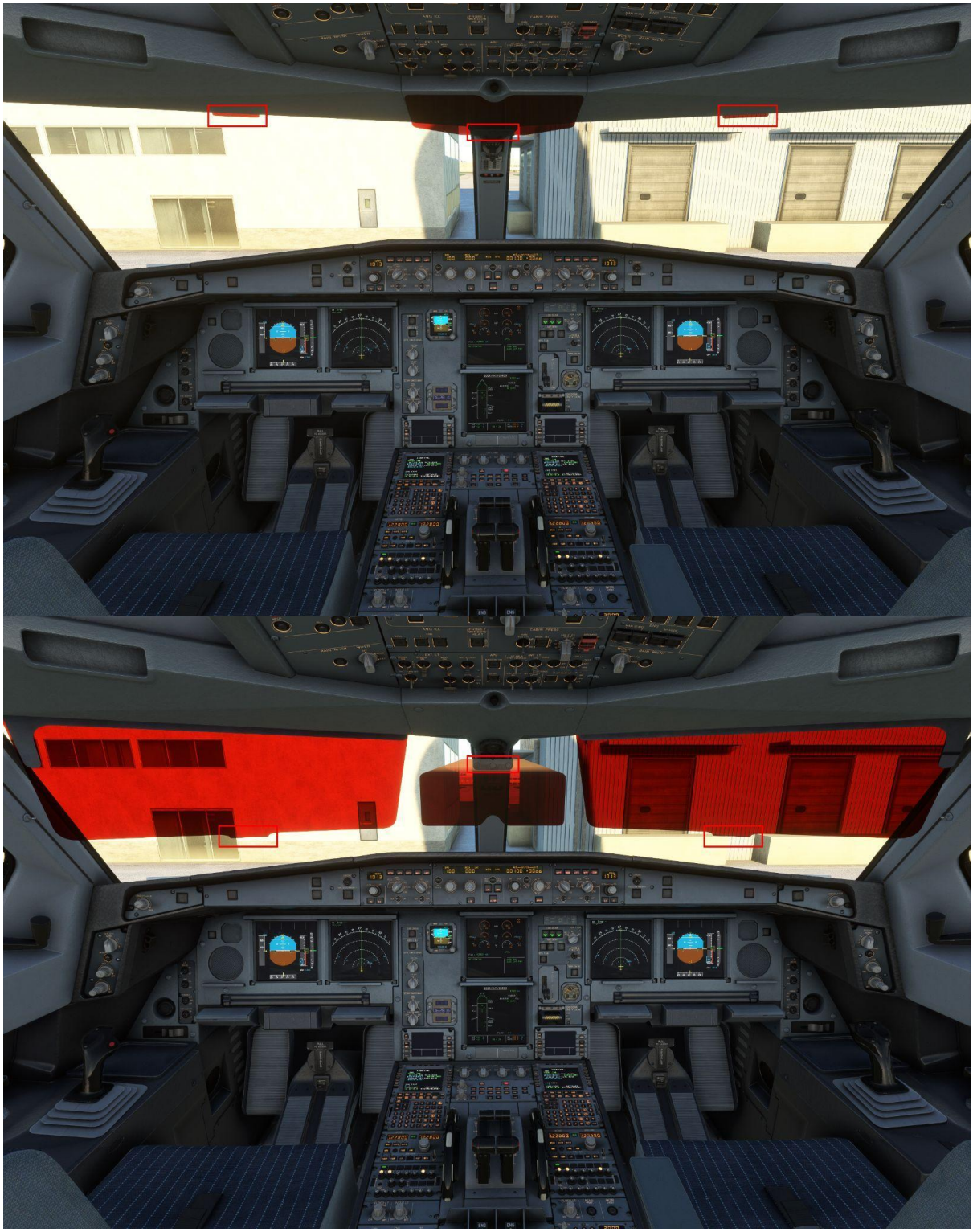

1. CPT MCDU
2. Switching Panel
3. FO FMCDU
4. ECAM Control Panel
5. CPT Radio Management Panel (RMP)
6. Thrust Levers / Pitch Trim Wheels
7. FO Radio Management Panel (RMP)
8. CPT Audio Control Panel (ACP)
9. FO Audio Control Panel (ACP)
10. Center Panel Flood and Integral Lighting
11. Pedestal Flood Lighting
12. Weather Radar Panel
13. Engine masters
14. Transponder
15. Speed Brake Lever
16. Engine Start Selector
17. Flaps Lever
18. Parking Brake
19. Cockpit Door Lock
20. Rudder Trim




1. ADIRS Switches
2. APU Fire Panel
3. Flight Control Panel
4. Fuel Inner Tank Split Buttons
5. Evacuation Panel
6. Emergency Electrical Power
7. Ground Proximity Warning System (GPWS) and Recorder Ground Control
8. Crew Oxygen Supply
9. Cabin Call System
10. CAPT Windscreen Wiper
11. FADEC Ground Control
12. Engine Fire Panel
13. Hydraulic Panel
14. Fuel Control Panel
15. Electrical Control Panel
16. External Power Push Buttons
17. Air Conditioning Panel
18. APU Bleed Push Button
19. Anti-ice Panel
20. Cabin Pressurization Panel
21. Exterior Lighting Panel
22. APU Master Switch and Start Push Buttons
23. Interior Lighting Panel
24. Passenger Signs Panel
25. Observer Audio Control Panel (ACP)
26. Observer Radio Management Panel (RMP)
27. Flight Control Panel
28. Smoke/Air Conditioning Panel
29. Ventilation Panel
31. Manual Engine Start Panel
32. FO Windscreen Wiper

# Other Controls

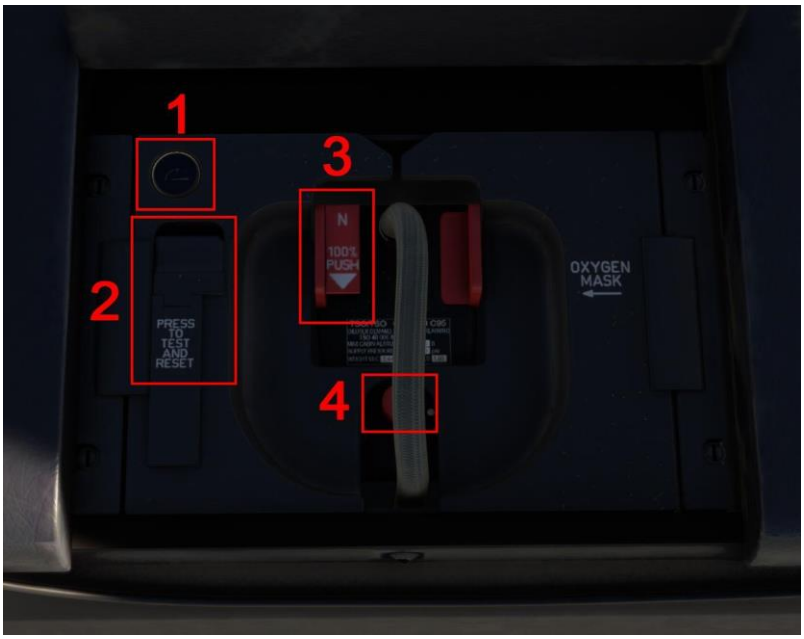
**Sun visor click spots**



**Captain left side**

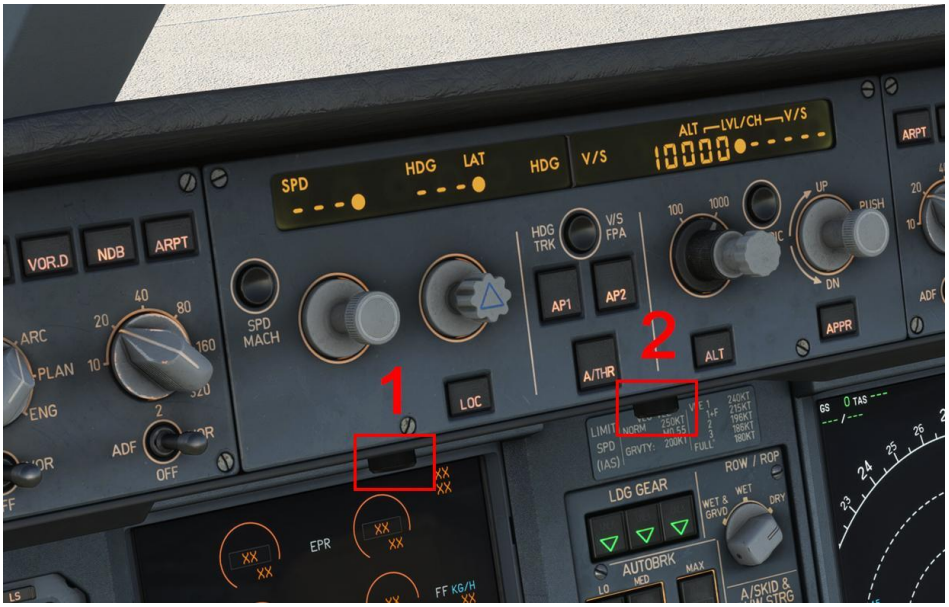

1. Oxygen Mask
2. Electronic Flight Bag (EFB)
3. Tiller and NWS Button
4. CPT Sidestick

**Oxygen Mask**




1. Blinker
2. Test button
3. Normal / 100% Oxygen selector
4. Overpressure selector

**Glareshield & FCU Lighting**




1. Glareshield Integral Lighting knob

2. FCU Display Brightness knob

# Electronic Flight Bag (EFB)

There is an Electronic Flight Bag (EFB) located on either side of the cockpit (Captain and First Officer) which is intrinsically linked to the aircraft Flight Management System (FMS). It is also linked to some core simulator functions like requesting the jetway, requesting ground power, setting default aircraft spawn states, etc. Simply click the Menu buttons on the left to navigate the pages.


Dashboard Page – Shows your current flight details as set in the FMS, along with METAR for your departure and arrival airports. There is also a METAR search functionality.


OFP Page – Request and show the Simbrief Operational Flight Plan (OFP).
Your Simbrief Pilot ID must be set within the Settings Page for this feature to work.


Ground Page – Controls doors on the aircraft along with requesting external Ground Power, chocks, covers and illumination of the cargo bay.


Cargo Page – Controls the loading and unloading of cargo. Note: some cargo has a specific weight, visible on the lower right. This value is automatically added when "Start Load" is pressed. Depending on the order of events, this could override the SimBrief payload or your previously entered ZFW. Once you have loaded your desired cargo please check the payload page to confirm the weights match what you planned for.


Payload Page – This page allows you to set the fuel and load on the aircraft and apply it to the FMS.


Panel State Page – This page allows you to select the state of the aircraft, shortcutting certain procedures.


Takeoff Page – This page allows you to set the conditions for takeoff to calculate your performance references.


When you click in the RWY box a new page will pop up showing you which runways are available at your departure airport.


Upon clicking any of the manual entry boxes, a pop-up keyboard will display. Commands entered into this keyboard will override any default key bindings that are set.
Close the keyboard by clicking the down arrow on the bottom right-hand corner of the page.
You may manually enter each parameter, or you can press the SYNC button, which will synchronize the selected runway in the MCDU, actual weather conditions, and the takeoff weight from the MCDU Init (initialization) B page.


Once all the information has been selected or entered, click the Calculate button to show your performance references and click the Send to FMGS button to send to the FMC.

NOTE:

- The EFB is unable to determine if the conditions are DRY or WET, you must select the correct option
- If you select calculate before the payload & fuel loading is complete you will receive the error: "Please complete loading before calculating takeoff performance". The EFB is unable to estimate the THS trim setting for takeoff during the loading phase. Once the loading is complete you will be able to obtain your takeoff performance

Options Page

The EFB can be turned off by pressing the power button to the left-hand side of the EFB. There are also brightness buttons here to increase or decrease the screen brightness.

# Aircraft Systems

The A330 **Beluga XL** has many advanced systems, many of which are tightly integrated in function with each other. The following section introduces the core systems required to successfully operate the aircraft in Microsoft Flight Simulator.

## Flight Management Guidance and Envelope System (FMGES)

The Flight Management Guidance and Envelope System (FMGES) comprises the following units:

- Two Flight Management Guidance and Envelope Computers (FMGEC)
- Three Multipurpose Control and Display Units (MCDU) (third MCDU is not modeled in this simulation)
- One Flight Control Unit (FCU)
- One Flight Management source selection device (not modeled in this simulation)

The Flight Management Guidance and Envelope System (FMGES) provides predictions of flight time, mileage, speed, economy profiles, and altitude. It reduces cockpit workload, improves efficiency, and eliminates many routine operations generally performed by the flight crew.

**Managed vs Selected Guidance**

The FMGES computes the aircraft position continuously, using stored aircraft performance data and navigation data. Therefore, it can steer the aircraft along a preplanned route and vertical and speed profiles. This type of guidance is known as “managed”.
If the flight crew wants to temporarily modify any flight parameter (SPD, V/S, HDG, etc.), they may do so by using the various Flight Control Unit (FCU) selectors. The FMGES then guides the aircraft to the target value of this parameter that they have selected. This type of guidance is known as “selected”.

### Flight Management Guidance and Envelope Computer (FMGEC)

Each FMGEC is divided into four main parts:
The Flight Management (FM) part controls the following functions:

- Navigation and management of navigation radios
- Management of flight planning
- Prediction and optimization of performance
- Display management.

The Flight Guidance (FG) part performs the following functions:

- Autopilot (AP) command
- Flight Director (FD) command
- Autothrust (A/THR) command.

The Flight Envelope (FE) part controls the following functions:

- Computation of data for the flight envelope and speed functions
- Monitoring of parameters used by FG and FE parts
- Windshear and aft Center of Gravity (CG) detection
- Computation of GW and CG information

The Fault Isolation and Detection System (FIDS) part performs the following functions:

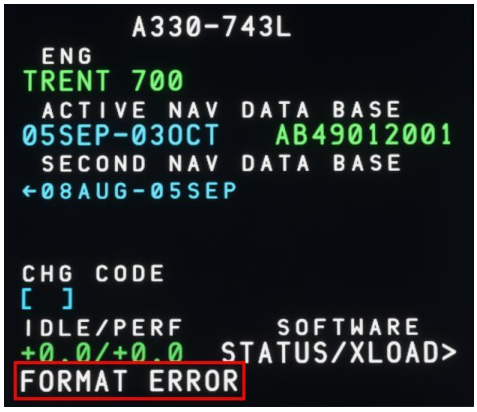


- Acquisition and concentration of maintenance data
- Interface with the Central Maintenance Computer (CMC)

## Multipurpose Control and Display Unit (MCDU)

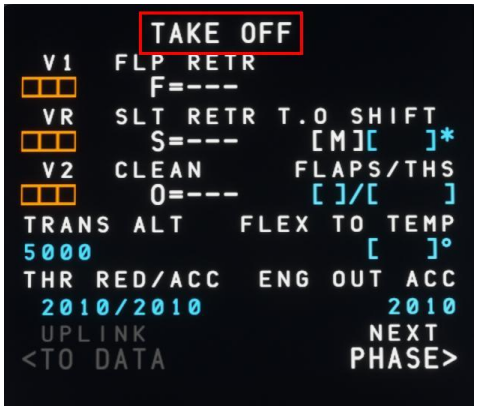

Two MCDUs are installed on the pedestal for flight crew loading and data display. The MCDU allows the flight crew to interface with the FMGEC by selection of a flight plan for lateral and vertical flight paths and speed profiles. The flight crew may also modify selected navigation or performance data and specific functions of Flight Management (revised flight plan, secondary flight plan, etc.).

Data that is entered into the MCDU that is illogical or beyond the aircraft's capabilities will either be disregarded or will generate an advisory message.

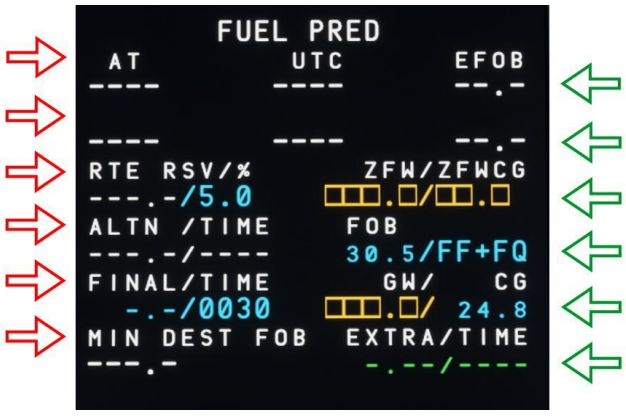



The MCDU includes a display that generates 14 lines of 24 characters each, including:

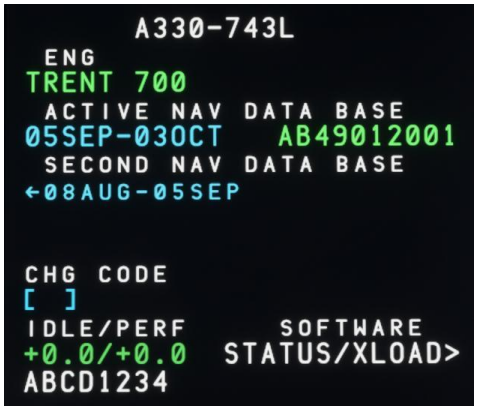
- A title line that gives the name of the current page in block letters.



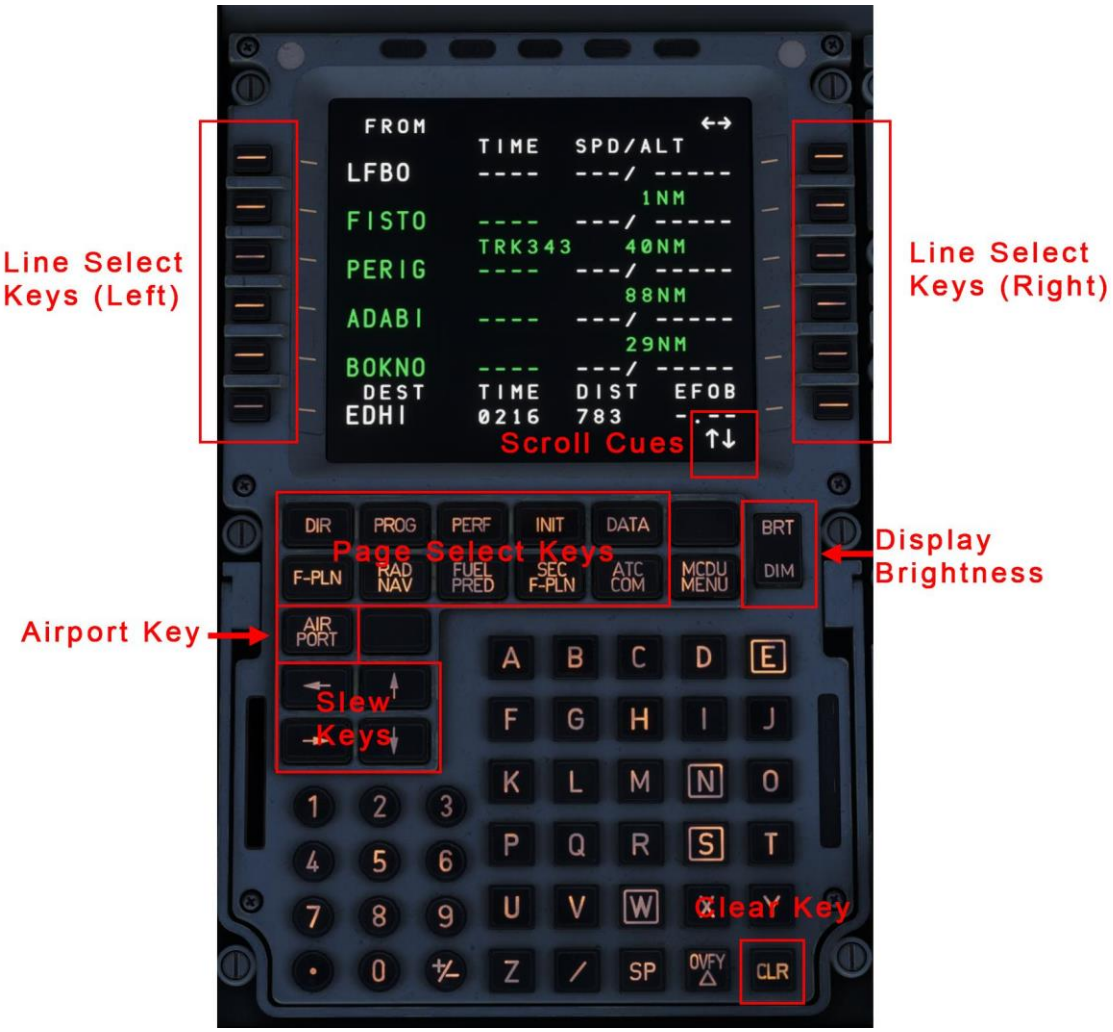

- Six label lines, each of which names the data displayed just below it (on the data field line).
- Six data field lines that display computed data or data inserted by the flight crew.




- The scratchpad line that displays:
  - Specific messages
  - Information the flight crew has entered by means of the number and letter keys and which can then be moved to one of the data fields.




MCDU Controls and indicators:




The keyboard includes:

- Function and Page keys
  Call up functions and pages the flight crew uses for flight management functions and computations.

- ↑↓ (or SLEW) keys
  Move a page up or down to display portions that are off the screen.

- ←→ (NEXT or PREVIOUS) page keys
  Moves to the next page of a multi-page element. An arrow in the top right corner indicates that another page is available.

- AIRPORT key
  Call up the flight plan page that contains the next airport along the current flight plan. Successive pushes on the key show the alternate airport, the origin airport (before takeoff), and the next airport again.

- Number and letter keys allow the flight crew to insert data in the scratchpad so that they can use a line select key to enter it in the main display.

- Two keys have special functions:
  CLR (clear) key Erases material (messages or inserted data) from the scratchpad or from certain areas of displayed pages.
  OVFY (overfly) key Allows the aircraft to overfly a selected waypoint.

Use and operation of the MCDU is covered in the quick start guide.

## Flight Control Unit (FCU or Autopilot)

**Basic Modes**

Selected vs. managed modes, how do we change mode and what do they do?

- Selected is when the knob is pulled out towards you, this means you have taken control away from the auto flight system
- Managed is done by pushing the knob so giving control back to the auto flight system

The AP is controlled by the FCU (Flight Control Unit) pictured below.

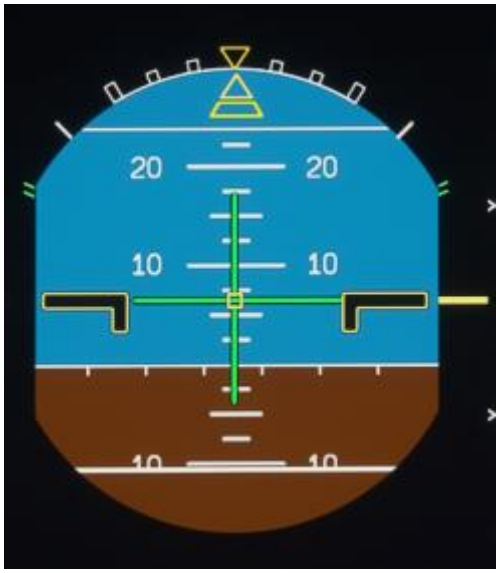

1) SPD/MACH push button:
Pushing this button changes the SPD target to the corresponding MACH target and vice versa.

2) SPD/MACH knob:
When pulled, this knob controls speed in IAS or MACH depending on altitude or if the SPD MACH button is pressed (upper left, 1).
When pushed, speed is 'managed' from the FMS.

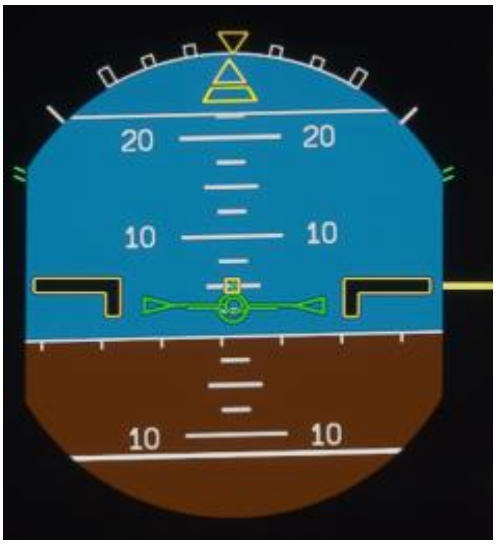
3) HDG (Heading) knob:
When pulled, this knob controls heading or track. You can swap between heading and track mode by pressing the HDG TRK button (5).
Pushing the knob arms managed NAV or within a set margin to the NAV track will automatically switch to NAV.

4) LOC (Localizer) push button:
Pushing this pushbutton Arms, engages, or disengages the ILS LOC mode.
This mode is normally used for localizer only approaches using managed lateral guidance with selected vertical guidance.

5) HDG V/S – TRK FPA push button:
The pilot uses this push button to select HDG (associated with V/S) or TRK (associated with FPA).
Pushing it displays the Flight Path Vector (FPV) on the Primary Flight Display (PFD) or deletes it.
On the PFD, it changes the FD crossbar display (with the aircraft attitude as its reference) to the aircraft Flight Path Director (with the flight path vector as its reference) and vice versa.




HDG/VS




TRK/FPA

The heading reference changes into track reference in the HDG/TRK window and vice versa.

The vertical speed reference target changes into a flight path angle reference target in the V/S-FPA window and vice versa.

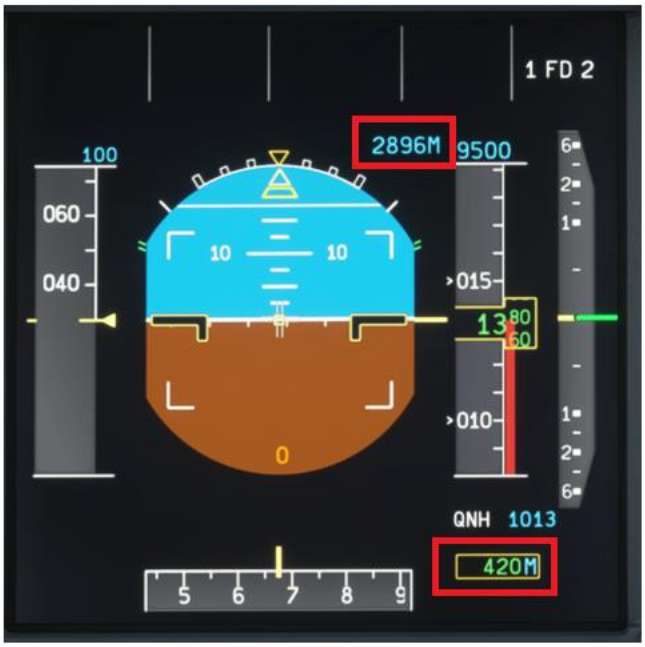

6) AP Engagement push buttons:
AP1 will engage Autopilot 1, normally associated with the Captain side.
AP2 will engage Autopilot 2, normally associated with the First Officer side.
Engaging both AP's will provide system redundancy requirements for low visibility (CAT 2 or above) approaches and autoland capabilities.
Disengaging the AP is usually done with the instinctive AP disconnect buttons on the side stick.

7) A/THR (Autothrust) push button:
The flight crew uses this push button to arm, activate or disconnect the autothrust.
Disengaging the A/THR is usually done with the instinctive A/THR disconnect buttons on the thrust levers.

8) Altitude knob:
When pulled sets OPEN CLIMB/OPEN DES or LVL change in other terms. If altitude is above you OPEN CLB if below you OPEN DES.
When pushed this sets CLB/DES or VNAV in other terms. This mode cannot always be engaged as the situation depends on the flight mode and phase of flight. The aircraft also needs to be in a managed lateral mode (NAV) to engage any VNAV mode.
The inner knob is a switch to select between 100 or 1000 feet increments.

9) ALT (Altitude) push button:
This pushbutton is used to command an immediate level off.

10) METRIC ALT push button:
Can toggle between displaying altitude in meters (metric) or feet (imperial) on the primary flight displays.




11) VS or FPA selector knob:
Pulling changes from vertical mode to VS/FPA mode and the aircraft will comply with what is set in the window. Please be aware that Airbus aircraft can be slow to follow large VS orders as the AP limits G forces imparted for passenger comfort.
Pushing the knob will set VS to 0 and command the aircraft to level off. This is used when you need to level off quickly.

## Other Flight Crew Interfaces

**Thrust Levers**

The thrust levers serve as the primary link between the Flight Management Guidance and Envelope Computer (FMGEC), the Full Authority Digital Engine Control System (FADEC), and the flight crew. Their functions include:

- Activating the autothrust during takeoff when FLX or TOGA is selected.
- Regulating the maximum thrust level when the autothrust is engaged.
- Deactivating the autothrust system when the flight crew moves the levers to the IDLE position.
- Enabling manual control of thrust when the autothrust is not in use.
- Initiating standard modes like takeoff or go-around when TOGA (or FLX for takeoff) is selected.

- Configure the autothrust to its armed mode when the levers are positioned between IDLE and the CL detent or between IDLE and MCT (one engine inoperative).


**Electronic Flight Instruments (EFIS)**

Two Primary Flight Displays (PFD) and Navigation Displays (ND) continuously supply the flight crew with guidance for flight, navigation details, and system advice throughout all phases of the flight.


There are EFIS control panels positioned at each end of the glareshield; these are responsible for managing both the Primary and Navigation Displays. These panels feature controls for selecting different modes on the PFD, including a selector to display the barometric altimeter setting. On the ND, pilots can choose from various distance ranges, and there are two switches available for displaying either the left or right VOR/ADF bearing pointers on the ND.

## Radio and Transponder Functions

## Radio Management Panel (RMP) & Audio Control Panel (ACP)

If using the in-sim ATC menu functions to change frequency, the radio will automatically update to changes, however you can manually tune the required frequency.


1) Active Frequency Display
   Displays the current radio frequency on the selected radio. For example, in the picture above: VHF1 is the selected radio, so the active frequency on VHF1 is currently 122.800.

2) Transfer Key
   Pressing this key moves the active frequency to the standby window and the standby frequency to the active window.
   This tunes the selected receiver to the new active frequency.

3) Standby Frequency/Course Display
   A display window shows a standby frequency that the pilot can activate by pressing the transfer key or change by rotating the tuning knobs.

4) Radio Communication Selection Keys
   When the pilot presses one of these keys:
   - The ACTIVE window displays the frequency set on that radio.

- The STBY/CRS window displays the selected standby frequency or course.
- The selected key displays a green monitor light.

5) Frequency Selector Knob
   The pilot uses these knobs to select the STBY frequency or CRS.
   The outer knob controls whole numbers; the inner knob controls decimal fractions.

6) Radio navigation Selection Keys
   The pilot presses one of these keys to select a navigation radio to control through this RMP. This is used for manual radio navigation tuning only. This turns on the key's green monitor light.

7) RMP ON/OFF Control
   Controls the RMP power supply.

8) Radio Transmission Keys and Reception Knobs
   When pressed, the associated channel is selected for transmission. The three green lines display. The pilot can deselect the channel by pressing the push button again, or by selecting another channel.
   Pressing and releasing the knob (knob out) selects the associated audio reception channel and the integral white light activates. Rotating the knob adjusts the volume.

9) Intercom / Radio Switch

10) Navigation Reception Knobs
    Pressing and releasing each knob (knob out) selects the associated audio reception channel and the integral white light activates. Rotating the knob adjusts the volume.

## Transponder Panel

If using the in-sim ATC menu functions to change the squawk code, the transponder will automatically adjust to this change, however you can manually tune the required code.


1) Mode Selector
   STBY: Both transponders are powered but do not activate.
   ON: Selected transponder activates.
   AUTO: In flight selected transponder activates.

2) Transponder Selector
   Switch between transponder 1 and 2.

3) Altitude Repeating Switch
   ON: The transponder sends barometric altitude data, equivalent to Mode C.
   OFF: No altitude data transmission. If the TCAS is installed, the upper ECAM displays "TCAS STBY" in green.

4) Keypad
   The flight crew uses the keypad to set the code assigned by ATC. To enter a new code the previous one has to be cleared first using the CLR key.

5) Code Display
   The window displays the selected code.

6) TCAS Traffic selector switch

7) TCAS Mode Selector switch
   TA/RA: Normal position.
   TA: The TCAS does not generate any vertical orders. This mode should be used, in case of degraded aircraft performance (engine failure, landing gear extended, or approach on parallel runways).
   STBY: The TCAS is on standby.

8) Transponder Ident button.

## Weather Radar (WXR)

TheAirbus A330 Beluga XL features a weather radar which is shown on the Navigation Display (ND) screen.


1) Gain knob
   This knob is used to adjust the sensitivity of the radar. CAL is the normal position,

2) Radar switch
   This switch turns either radar 1 or radar 2 on or both off when in the middle position.

3) Predictive windshear switch (not modeled in this aircraft)
   Activates or deactivates the predictive windshear function

4) Display mode selector (only WX mode is modeled in this aircraft)
   - WX: Weather mode: Colors indicate the intensity of the precipitation
   - WX+T: Weather and Turbulence mode: In addition to WX mode, turbulence areas will be displayed in magenta
   - TURB: Turbulence mode: Turbulence areas will be displayed in magenta
   - MAP: Map mode: radar operates in ground mapping mode

5) Tilt knob
   This knob adjusts the tilt of the radar. Zero indicates the horizon reference

6) Ground Clutter Suppression switch (not modeled in this aircraft)
   Not modeled in this aircraft

# Operations and Techniques

This section outlines the procedures and techniques required to operate the A330 **Beluga XL** safely and efficiently throughout all phases of flight.

The sections are divided as follows:

**Walk-through Guide:** A complete A to B flight from cold and dark to shutdown to get you up and running.

**Normal Checklist:** To be used to *Confirm* procedures have been completed correctly in prior flows. These are available as a separate document.

**Simplified Procedures:** Condensed description of flows for quick reference. Normally, actions are committed to memory, with this guide as a quick reference tool.



## Walk-through Guide

We are going to simulate a scheduled passenger service from Toulouse, France (LFBO) to Hamburg Finkenwerder, Germany (EDHI). We will use the built-in Simbrief functionality and assume the user is familiar with creating and exporting a Simbrief flight plan.

The procedures used here are not meant to replicate full real-world operations; this will, however, get the pilot airborne and flying in the minimum amount of time.

We are assuming we have selected the aircraft and loaded it at an available stand at LFBO cold and dark.

## Preliminary Cockpit Preparation

You can use the in-sim checklist to prepare the aircraft or simulate arriving at the aircraft prepared by an engineer with the ground power unit (GPU) or auxiliary power unit (APU) on. To do this, select Panel State (1) on the EFB and select 'On APU' or 'On GPU' as required. The simplified procedures checklist can also be used as a basic guide to supplement this walk-through.

*Note – if the EFB screen appears blank, press the on button or increase the brightness.*


Ensure your Simbrief Pilot ID (1) is entered in the EFB Options tab.
Note here that when entering text information, controls to the simulator are temporarily disabled. To exit this condition, press the remove keyboard function on the EFB (2).

Ensure that you are on the EFB Dashboard page (1) and press the download Simbrief icon (2).


Flight Number, Departure, Destination and Alternate Airfield data will be populated if the uplink is successful. The OFP page of the EFB will also be populated.

You can simulate opening the required doors for loading from the EFB Ground (1) page. As you should now be running the aircraft on APU, you can disconnect the GPU by pressing the Toggle GPU button (2).

To load cargo you will select the Cargo page (1) from the EFB shortcuts. Here you can choose between a few options. Once you click on “Start Load” (2), the loader will become visible outside and load your selected cargo. Note: the Front Cargo Door must be fully open for cargo to be loaded/unloaded.

In the Payload page (1) you can manually select the Zero Fuel Weight (ZFW) and Fuel load using the sliders or entering the values in the applicable boxes. Press (2) to automatically uplink the information from the Simbrief plan. If the EFB option to use ZFW is set to 'No' then the pilot can select the number of passengers and cargo weight manually instead. Once the desired values have been entered, pressing the Apply Load (3) button will add the payload.
Note: in the Cargo page you can see the weight of your chosen payload, which is added automatically to your aircraft. If you look in the screenshot below, the Live Gross Weight is 173,800 kg. This equates to the empty weight (127,500 kg) plus the weight of the 2x A320 Fuselages (6,300 kg). The weights will be overridden If you now change the ZFW or uplink the Simbrief plan information. Always confirm that your Live Gross Weight after applying your load matches your planned weights.


The aircraft should now have power applied and running on its own with a load in progress or complete.

The aircraft will automatically run through its power-up test as indicated by the screen displays.

Whilst the aircraft is running through its power-up test, you can start preparing flight details and passenger/cargo load.

In normal real-world operations, the aircraft Flight Management Guidance and Envelope System (FMGES) is initialized at this stage via the Multipurpose Control and Display Unit (MCDU) so that pre-flight planning data can be sent and received by the airline operations control room.

The MCDU will normally be on the Aircraft Status page after the power up test. Here you will check if the aircraft and engine type (1) are correct. You can also change the navigation database (2) if required by selecting L3.


If the MCDU has not initialized on this page, or you have inadvertently selected another page, press DATA, then select key L4 for A/C STATUS.

To initialize the flight, press the INIT page (1) key to bring up the INIT A page on the MCDU. If the Simbrief ID number is entered correctly, you should see an INIT REQUEST* prompt next to line select key R2. Press this to uplink the currently saved Simbrief flight. You can also manually enter the city pair (departure and destination airport ICAO) to load the active flight plan. For example, type LFBO/EDHI into the scratchpad and press line select key R1. Confirmation of the saved route (if available) will be displayed.

The MCDU has now been initialized.

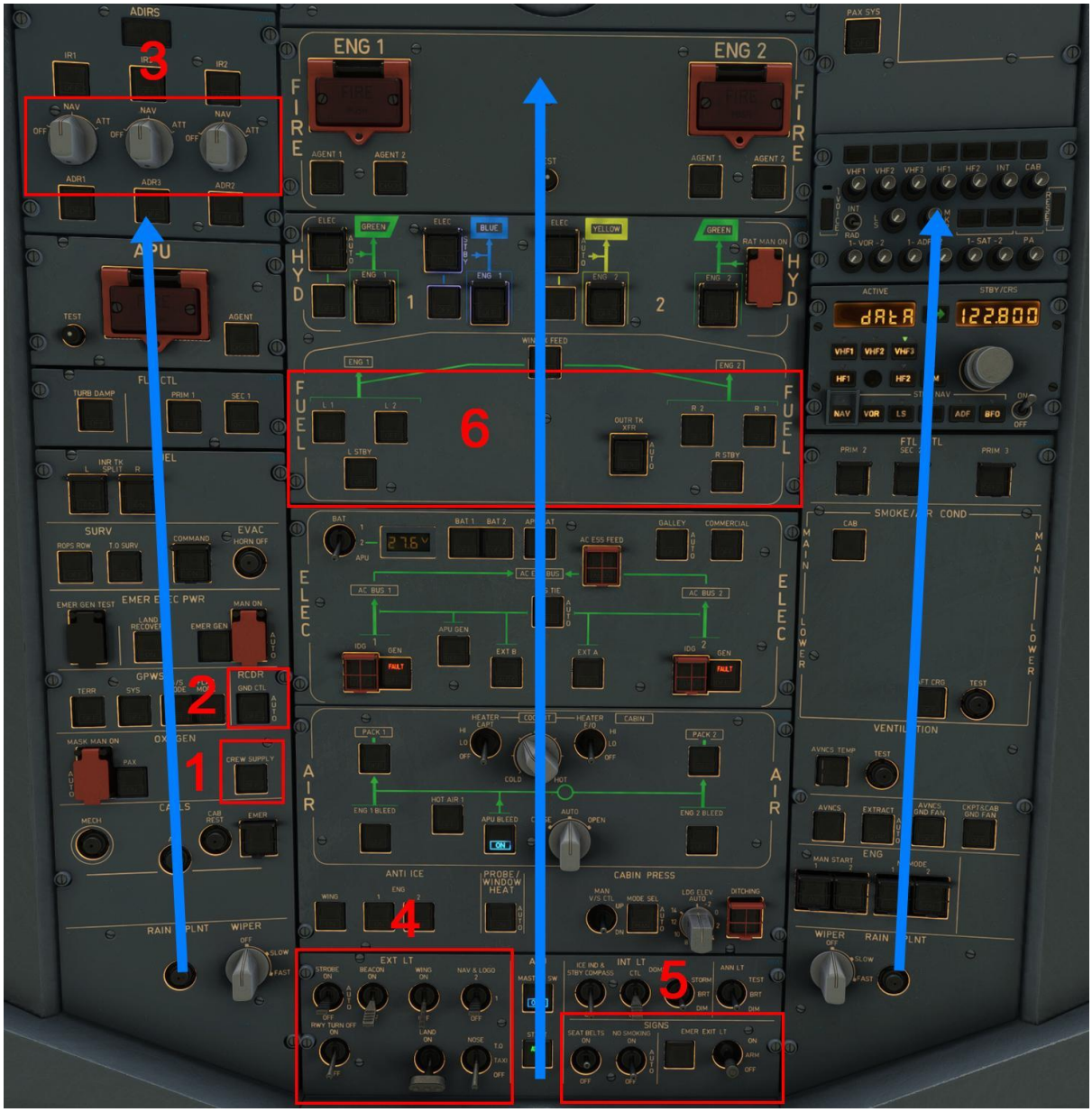
## Cockpit Preparation

To properly configure the aircraft, you will use a series of cockpit 'flows' and scans. You can also use the in-sim checklist for guidance.

The scans normally start on the overhead panel using a bottom-to-top, left-to-right flow. Pay close attention to the following items to ensure that the aircraft is properly configured for departure.

Any white lights (OFF) switch should be turned ON during this flow.

1) Crew Oxygen Supply ON (light out).
2) GND CTL AUTO (light out).
3) ADIRS selectors 1, 2 and 3 need to be in NAV.
4) Exterior lighting panel should be set as follows:
    a. STROBE switch – AUTO
    b. BEACON switch – OFF
    c. WING switch - OFF
    d. NAV & LOGO switch – 1 (either 1 or 2 can be used)
    e. RWY TURN OFF switch – OFF
    f. LAND switches – OFF
    g. NOSE switch – OFF
5) Passenger signs panel should be set as follows:
    a. SEAT BELTS switch – ON/AUTO (once refueling has been completed)
    b. NO SMOKING switch – AUTO
    c. EMER EXIT LT switch – ARM
6) Fuel pump push button switches all On.

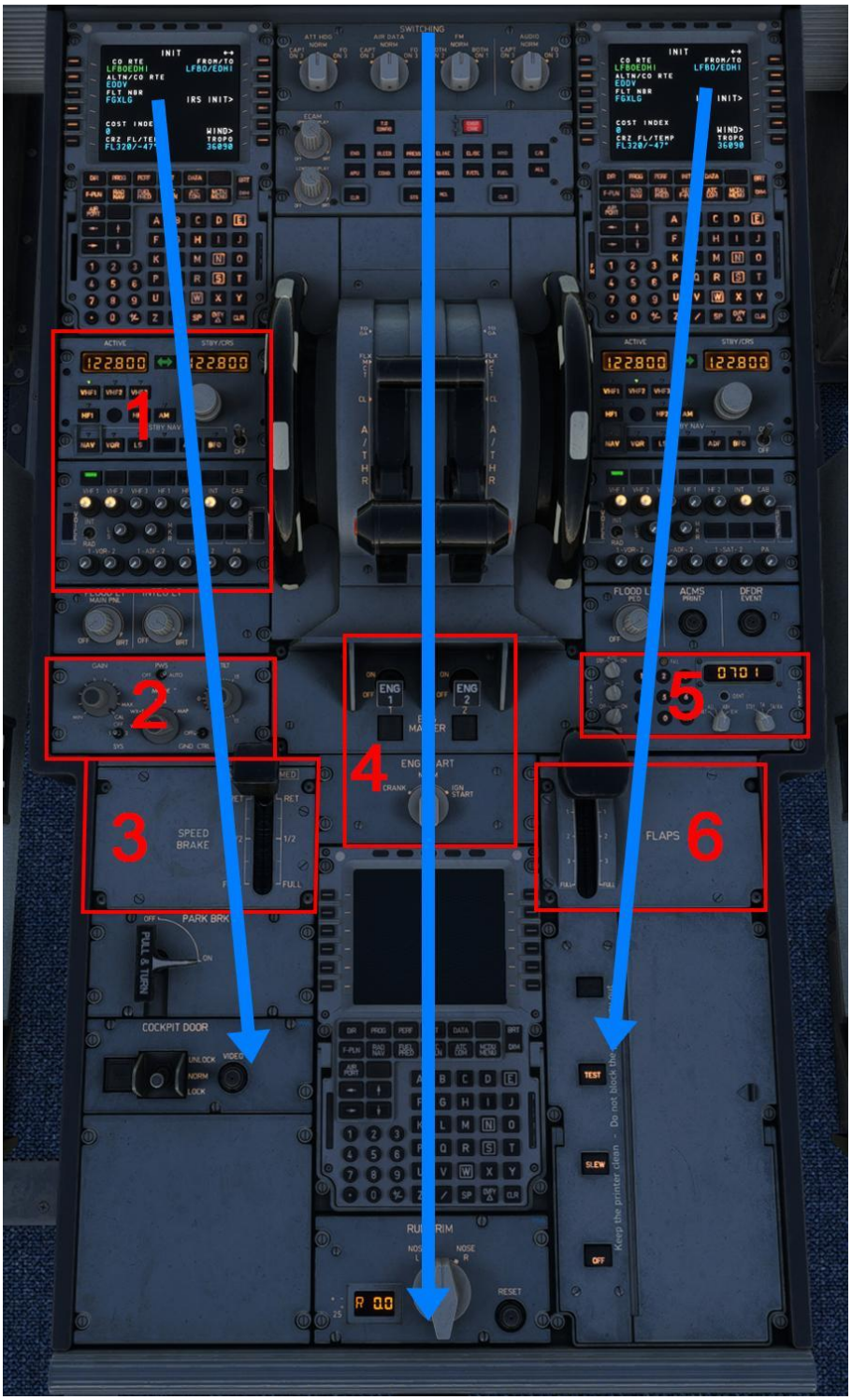

3
ADIRS
ENG 1
ENG 2
FIRE
APU
HYD
6
FUEL
ELEC
2
RCDR
1
CREW SUPPLY
4
ANTI ICE
AIR
CABIN PRESS
5
EXT LT
INT LT
SIGNS
WIPER
RAIN
PLNT
SURV
EVAC
EMER ELEC PWR
GPWS
OXYGEN
CALLS
PAX SYS
VENTILATION
ENG

Center Instrument Panel

1) ISIS is ON and aligned, set QNH
2) Clock is in GPS mode
3) Confirm landing gear lever DOWN
4) A/SKID & N/W STRG is ON

The Center Pedestal

1) Set radios to applicable frequencies and adjust volume knobs as required
2) Weather radar OFF, set the tilt and gain
3) Spoilers RET
4) Engine masters OFF and ENG START in NORM position
5) Transponder code set and OFF
6) Flap lever must match the flap position indicated in the E/WD



Now we will finish setting up the FMGES using the MCDU interface. Most of the information required will already be entered if using the Simbrief import function.

To enter the departure runway and Standard Instrument Departure (SID), press the F-PLN page (1) and press line select key L1 (2) to open the lateral revision (LAT REV) subpage.


Press line select key L1 again to enter the DEPARTURE runway and SID.

Using the up and down slew keys (1) you can scroll to see all applicable SIDs for the selected runway. Using the left line select keys (2) choose the SID. Some SIDs have various transitions, these can be selected with the right line select keys (3). If your transition is not visible you might need to use the up and down slew keys (1). Our SID today does not have multiple transitions, this is why this area is blank.


You can see above we have entered runway 32L and the FIST07B departure at LFBO (Toulouse). You can enter this directly to the flight plan by pressing the line select key R6 or review the input fully by pressing the F-PLN page key to return to the flight plan.

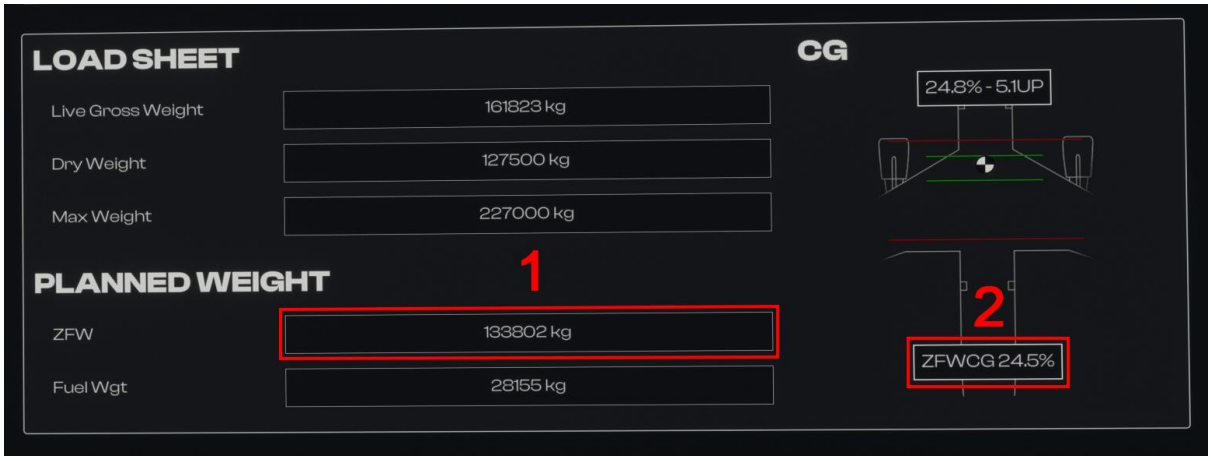
You can get a better view of the planned route on the ND by turning the EFIS control knob to PLAN and increasing the range. You should also select the CSTR (constraints) option to confirm the flight plan altitudes are entered correctly according to the appropriate chart.

*Note – the FMGES has no weight information at this point so will draw straight lines between waypoints.*


At this point you can also receive wind data from Simbrief and enter a secondary flight plan, usually used for an immediate return to the departure airfield, if required. Depending on the length of flight, the arrival can also be entered at this point, but for this demonstration you will leave as-is until you are in the cruise phase.

Most of the lateral and vertical navigation should now be set in the FMGS. The aircraft now needs to know the weight to calculate lateral and vertical performance. To do this, you will need to enter key values in the INIT B page.
Select the INIT page and slew right using the slew keys.
You can enter the ZFW, ZFWCG and BLOCK fuel figures manually or automatically.
To enter them automatically press right select line key 1 and 2. NOTE: loading and refueling must be complete for the figures to be accurately populated.

If you would like to manually insert the figures, start by inspecting the EFB.
The Zero Fuel Weight (1) and ZFWCG (2) to enter can be taken from the EFB Payload page.




The block fuel can also be taken from this page but is usually taken from the upper ECAM Fuel On Board (FOB) display.

You then need to calculate some safe takeoff performance criteria for the aircraft based on current airfield conditions and the aircraft payload. This can be done using the EFB Takeoff page (1).

Pressing the Sync (2) button will sync the airfield live weather data from the sim and the aircraft weight. You may need to adjust the takeoff runway and aircraft configuration in certain circumstances.

Once all the data is entered, you can press Calculate (3) to view the performance figures. If satisfied with the output these can be sent directly to the FMGS by pressing the Send to FMGS button (4).

Note on the MCDU PERF page that the takeoff speeds are now ready to be inserted (1). To confirm the takeoff data (2), press line select key R6. This will also populate the FLEX TO TEMP (3) and you FLAPS/THS (4).


You would normally cross check the data entered from the EFB.

This concludes the minimum MCDU configuration requirements. Configure the autopilot (FCU) as the final step of the MFGES and cockpit preflight preparation process.

Check that the altimeter pressure setting (1) is correctly set on the FCU (you can press the default key command 'B' to set the correct pressure).

The Flight Directors (FD) (2) are required to be 'On' for both Captain and FO sides. They should be turned 'On' by default during the initialization process.

Set your EFIS display options as you prefer (3).

The Speed (SPD) and Lateral Navigation (LAT) should both be automatically set in Managed Mode (4). If they are not, pushing the relevant control selector knob underneath the display will activate them.

The FCU should be in Heading and Vertical Speed (HDG V/S) mode (5).

Set your first assigned altitude using the altitude selector knob (6). This is normally indicated on the SID chart or given by ATC. For the purpose of this flight, we will set this to our cruise altitude. The aircraft will respect altitude constraints in the FMGS flight plan if entered correctly.

Armed and Active modes are cross checked on the Primary Flight Display (PFD).

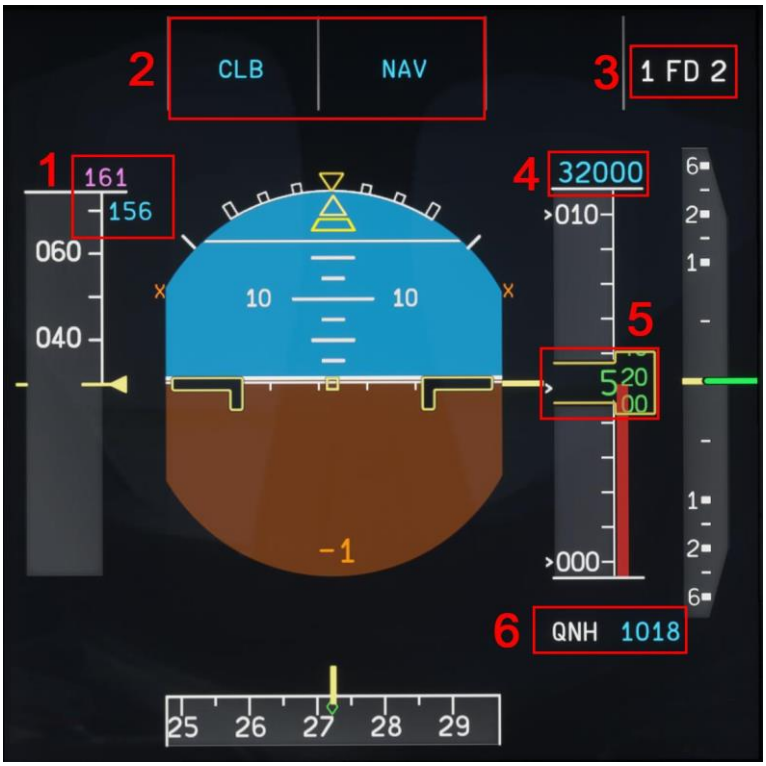
The Decision (V1) and Initial Climb Speed (V2) are displayed on the speed tape (1).

The vertical and lateral flight direct and autopilot modes are armed (blue) on the Flight Mode Annunciator (FMA) (2).

Both Flight Directors are 'On' (3).

The FCU altitude is set to our initial altitude (4).

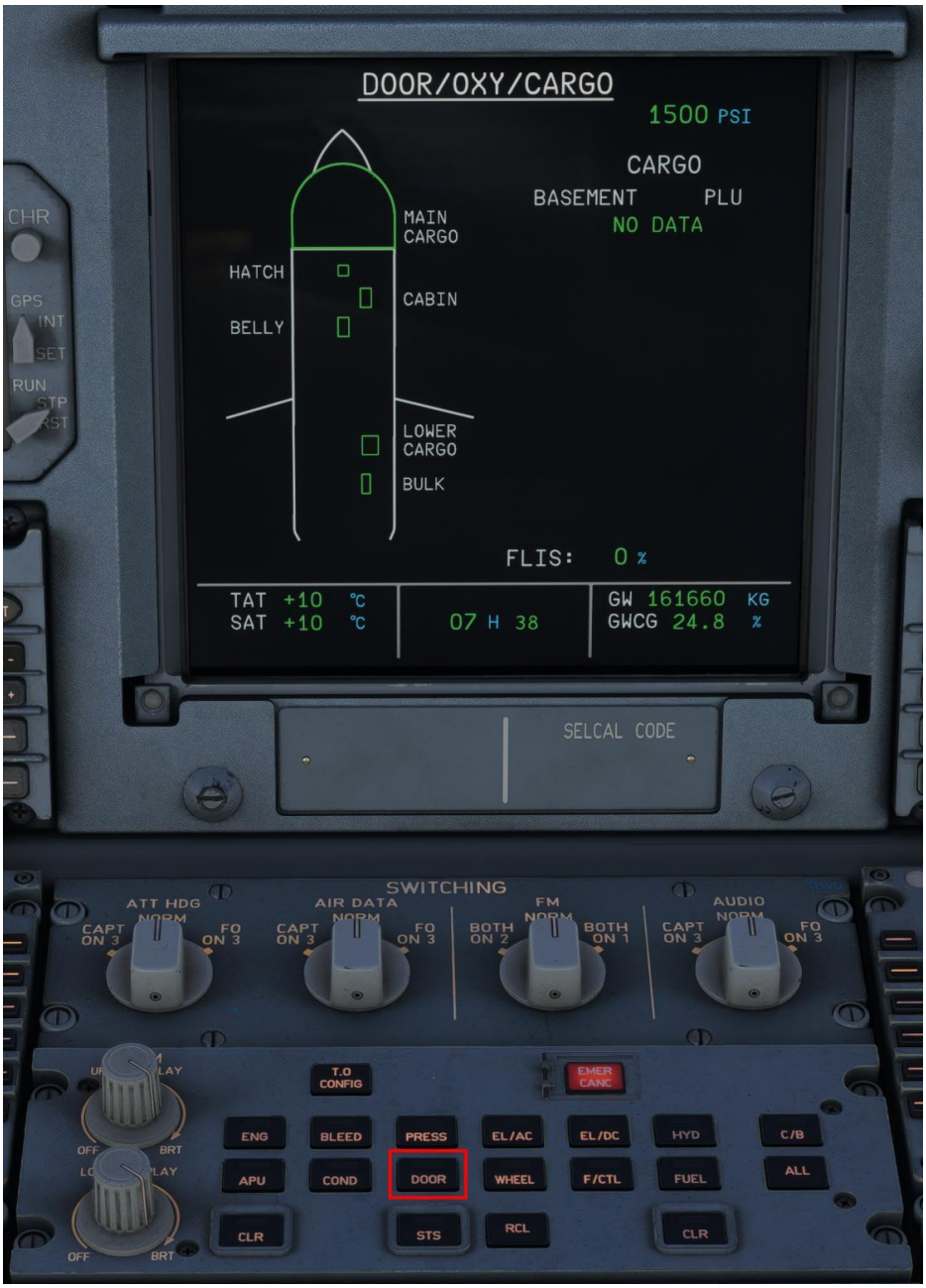
The aircraft's current altitude (5) is correct according to relevant data on the currently selected pressure setting (6).



## Before Engine Start

Prior to progressing to the next phase, ensure that loading is complete and the aircraft is ready for pushback and engine start.
Press the EFB Ground Page and select Close All. You should also remove the GPU and Chocks if not already completed.

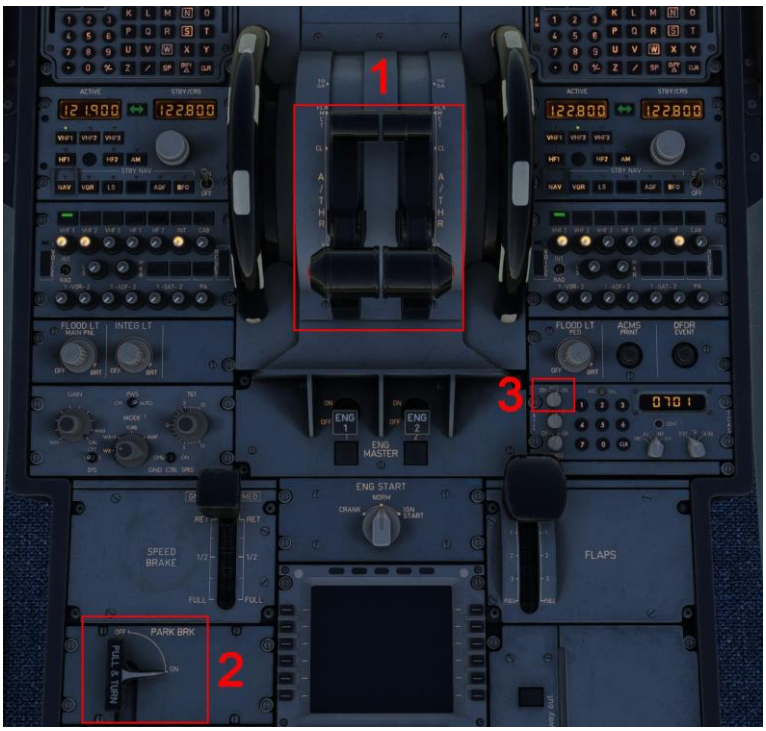
You can confirm the status of the doors from the cockpit by viewing the lower ECAM display. This should normally be on the DOOR/OXY page after initialization but can be selected by pressing the ECAM control DOOR button.




Once all exits and cargo compartments are closed, call ATC for pushback and start-up clearance.

Turn the BEACON light to ON.


1) The thrust levers are on idle
2) Parking brake is set to ON
3) Set the transponder to AUTO



## Pushback and Engine Start

The pushback can be initiated using the in-sim ATC menu.

You can start the engines while the pushback is underway. Ensure the APU is Available (AVAIL) (1) and the APU Bleed is ON (2).


The Airbus A330 Beluga XL procedurally starts Engine 1 first to power the (blue) hydraulic system, which in turn pressurizes the accumulator that feeds the brake system.

Turn the Engine Mode Selector to IGN/START (1) and then turn Engine Master Switch to ON (2).

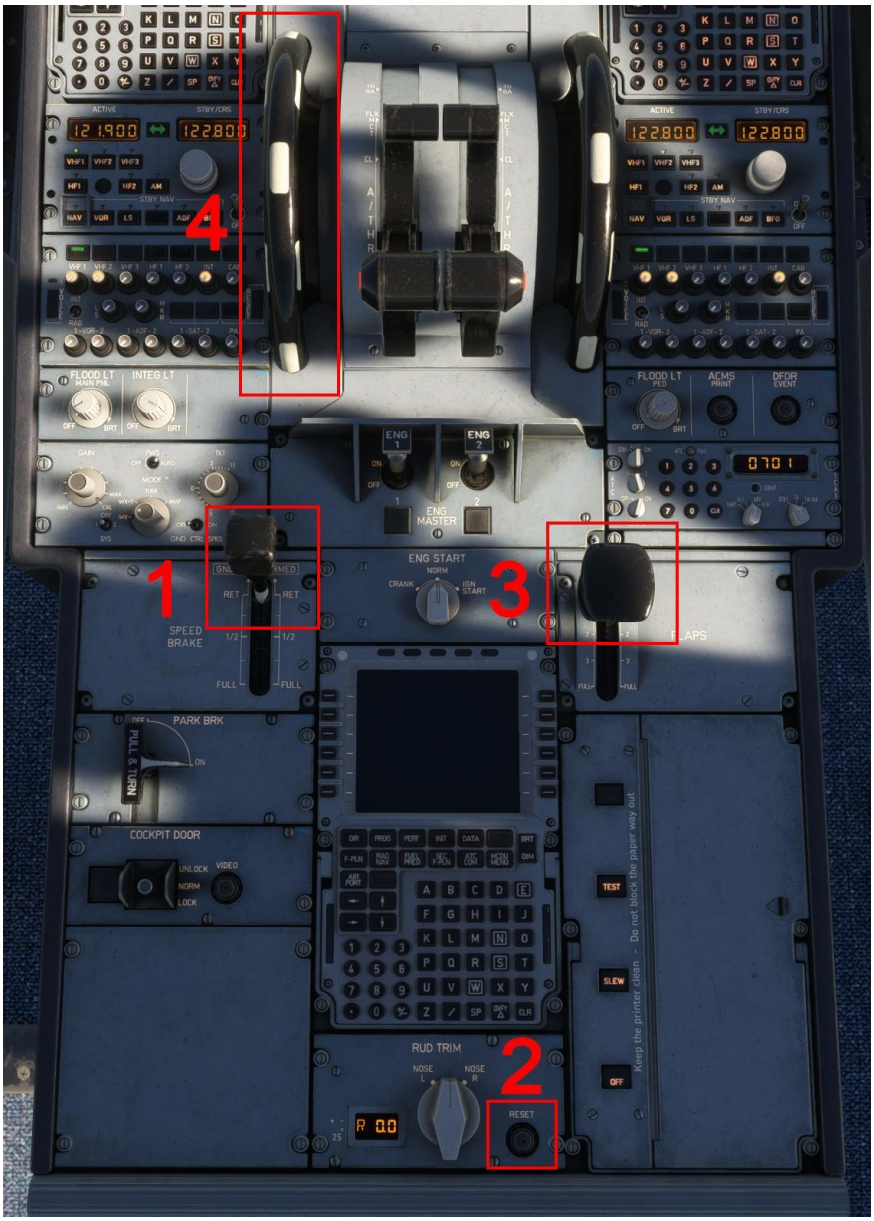
Once the startup is successfully completed by the FADEC, an AVAIL indication is shown temporarily on the ECAM Engine Warning Display (EWD).


The procedure for starting Engine 2 is identical to that of Engine 1.

## After Engine Start

After the start sequence is complete for both engines and the pushback tug has disconnected from the aircraft, conduct the next procedure flow.

1) Turn the Engine Mode selector to NORM.
2) Turn the APU Bleed OFF and then the APU Master switch OFF.
3) Arm the Ground Spoilers (1) by pulling the control upward.
4) Reset the rudder trim to zero (2).
5) Set the Flaps (3) to the required takeoff setting; in this scenario Flaps 1.
6) Confirm that the trim value has been correctly set to the value displayed in the MCDU PERF TO page (4). This setting is done automatically only once and can be adjusted by the pilot.

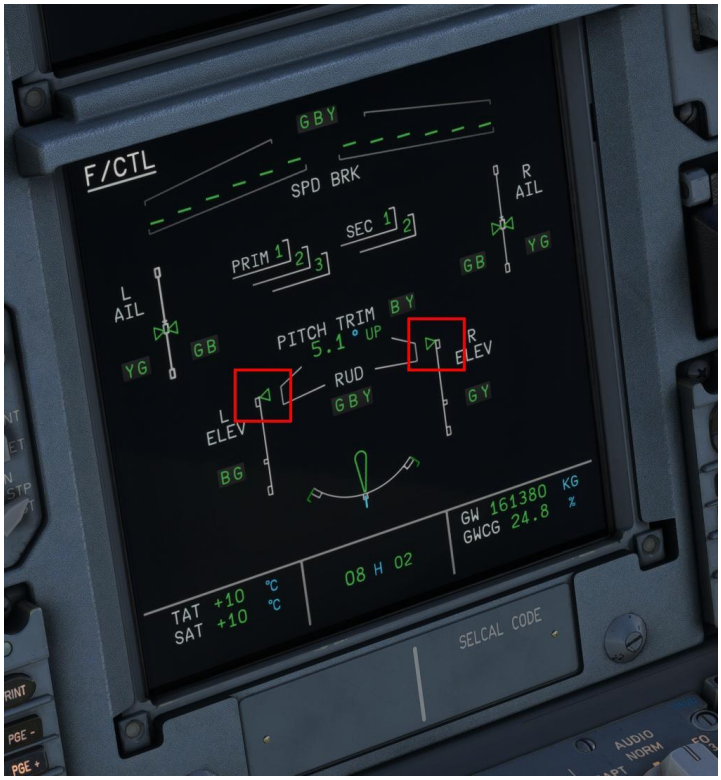



The aircraft is now ready to taxi under its own power.

## Taxi Out

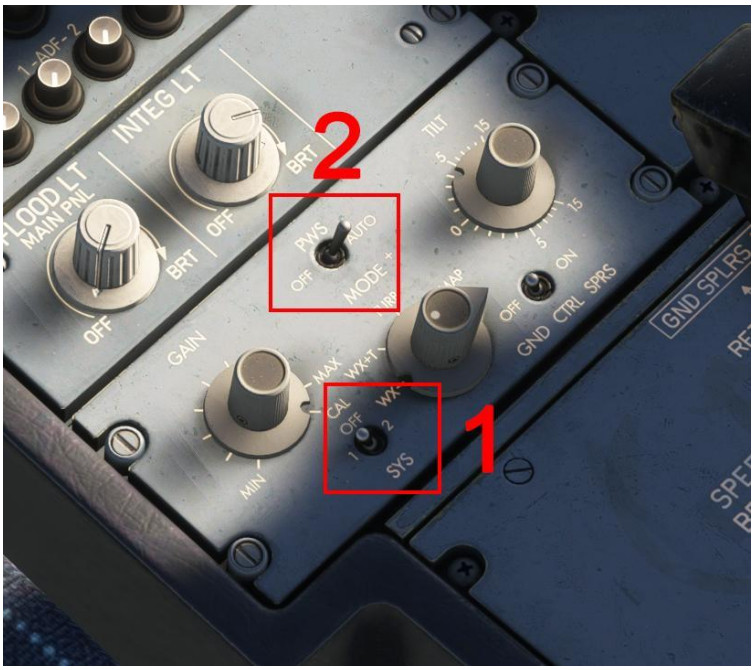
The following set of flows are typically completed during the taxi phase of operation, but should be conducted now. Once you become more accustomed to these procedures, you will be able to undertake them while the aircraft is in motion.

Begin by checking flight controls. Smoothly apply and hold full deflection of your joystick and identify corresponding inputs in the SD. Note that you do not need to select the F/CTL page; the F/CTL page will automatically display once you apply a joystick input. Full-up elevator input is shown below.

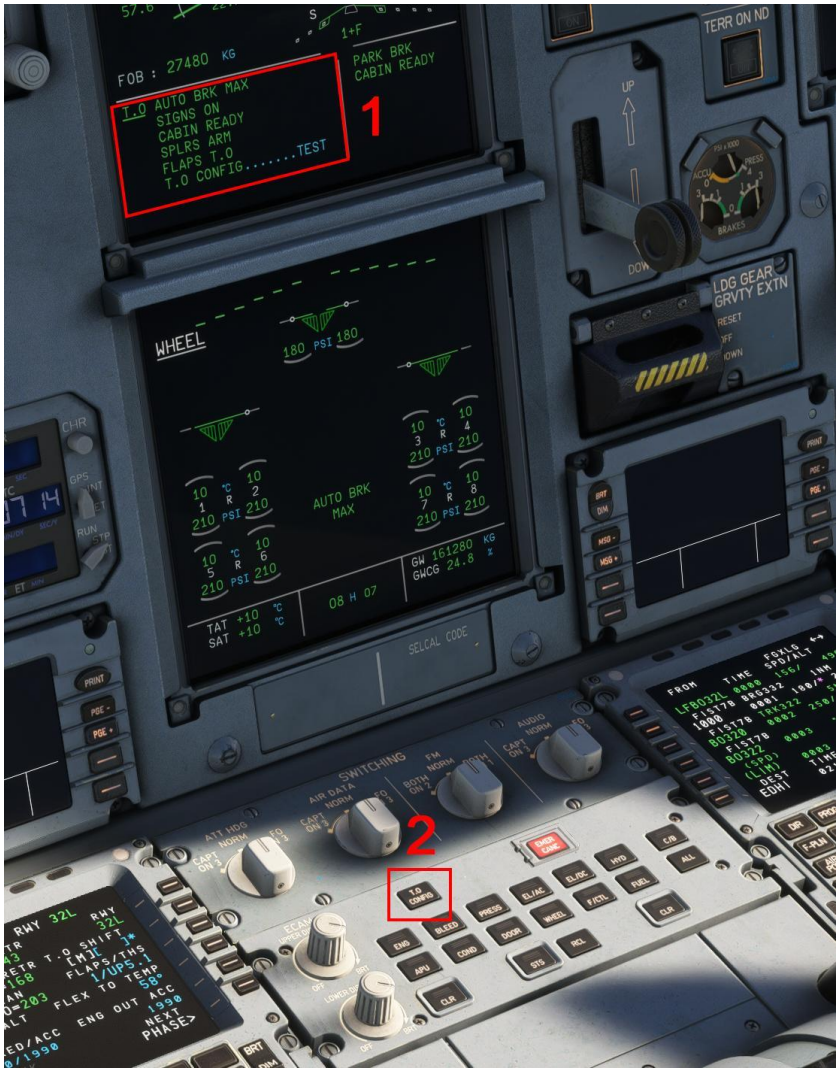



Set the Auto Brake to MAX when the control check is complete.

Turn the Weather Radar ON by selecting System 1 or 2 (1) and turn the Predictive Windshear System to AUTO (2)




Check that the T.O. Memo has no blue items (1). Cabin Ready may still be blue in some instances. You can force this to the 'Ready' requirement by pressing the FWD CALL on the overhead panel. Once all the criteria are fulfilled, you can press the TO CONFIG test (2) push button on the ECAM control panel to complete the test.




Set the Nose Light to TAXI and RWY TURN OFF to ON; this will indicate to aircraft and vehicles around you that the aircraft is about to move under its own power.


You can now begin the taxi to the runway for departure. This is normally done using the tiller located on the side console. For simulation purposes this is linked to the rudder pedals for easier use.
Releasing the parking brake and leaving the engines at idle is usually sufficient to get the aircraft rolling; at heavier weights, a slight increase in thrust may be required. This should be limited to a maximum of 40% N1.


Taxi to the active runway using the minimum thrust required whilst keeping your speed below 30 kts. This can be monitored with the Ground Speed (GS) indication on the top left of the Navigation Display (ND). The preferred method is to allow speed to build to 30 kts then apply one

smooth brake application to slow the aircraft to around 5 to 10 kts. This avoids applying constant brake pressure which will cause them to overheat prior to departure. Keep a speed of 10 kts on 90 degree turns.

Apply the parking brake when holding short of the departure runway.

## Before Takeoff

Once ATC has issued takeoff clearance, perform the following flow to ensure that the aircraft is prepared for departure. For ease, complete this while the aircraft is stationary.

1) Exterior lighting panel should be set as follows:
    a. STROBE switch – ON
    b. LAND switch – ON
    c. NOSE switch – TO


2) ATC Transponder and Traffic Collision Avoidance System (TCAS)
    a. ATC Mode – AUTO/ON
    b. TCAS Selector – TA/RA

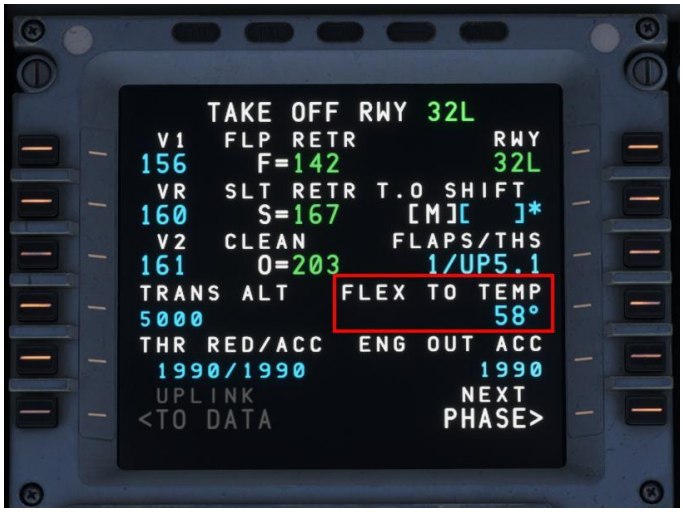

Depending on aircraft performance and external conditions, you would now normally confirm the status of the Air Conditioning PACKS and Engine Ignition mode. For this flight it is not required.

## Takeoff

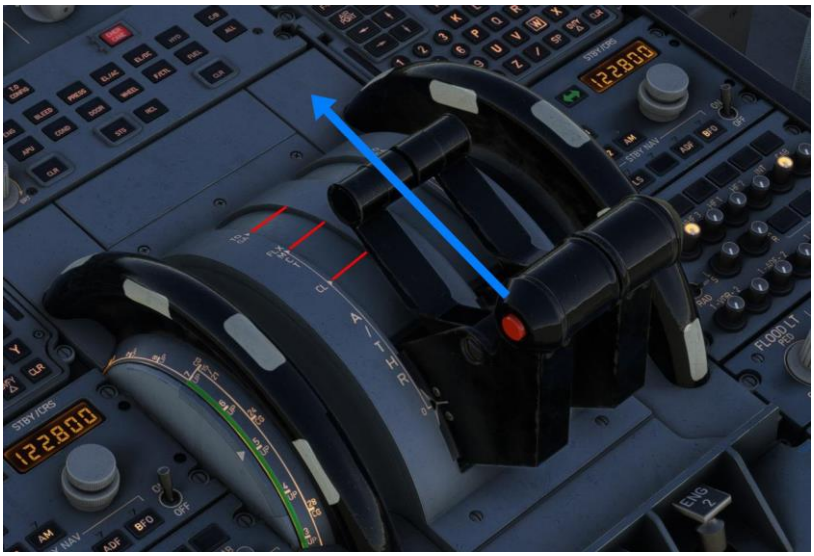
We suggest you read through these next steps a few times before attempting the takeoff, as with any aircraft the takeoff and initial climb phase progress in quick succession, and it is easy to 'get behind' the aircraft. Line up with the runway and apply the parking brake initially (you would not do this for normal operations).

The A330 **Beluga XL** thrust management is conducted by the FADEC and FMGES. There are two main settings for takeoff: Takeoff and Go Around (TOGA) or FLEX. TOGA will provide maximum available thrust to the engines whereas FLEX effectively derates the engines to provide less power but increase engine life.

*Note - To make use of the FLEX setting you must enter a FLEX temperature value in the MCDU Performance page.*



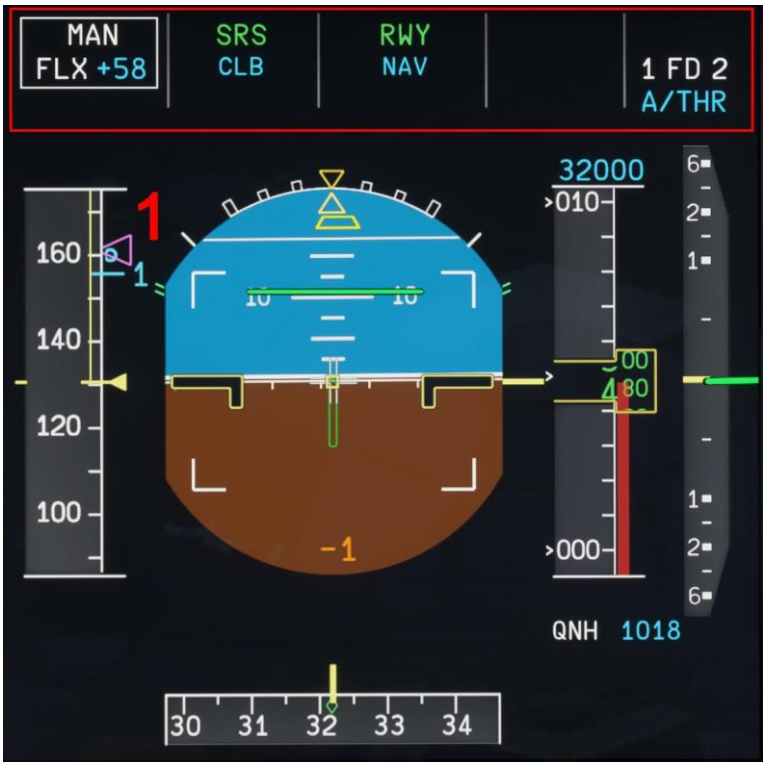

The throttles have detents and audible clicks for each phase. For FLEX takeoff you will move forward two detents/clicks, for TOGA you would move the throttles fully forward (or 3 detents/clicks).



Hold the side stick approximately half travel forward, this ensures the nosewheel remains in contact with the ground and nose wheel steering can be maintained during acceleration. Now release the parking brake. The aircraft will accelerate quickly! Maintain the runway centerline using the rudder pedals to steer. The fly-by-wire system will gradually blend nosewheel steering to the rudder only.

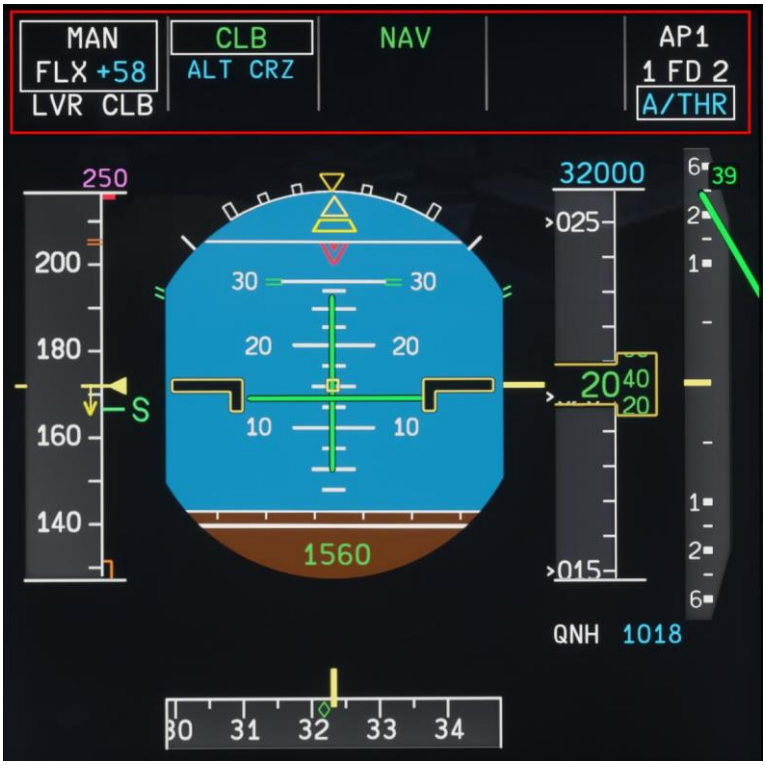
You will notice some annunciators appear on the PFD indicating that elements of the FMGS and AP are active or arming. Notably the thrust mode is in FLEX and the vertical guidance is in Speed Reference System (SRS) Mode. The lateral navigation mode Runway (RWY) is only present if the takeoff runway has an ILS associated with it. Finally the auto thrust (A/THR) is armed. Climb and Navigation modes are currently still armed, ready for the acceleration phase.

Whilst accelerating, gradually release the forward stick pressure to a neutral point by 100 kts. Shortly after you will reach V1 (first speed indicated in blue (1)), your decision speed. Barring any major technical issues, you will continue the takeoff. At VR (the blue circle on the speed tape (1)) we will gradually initiate the rotation by pulling back on the stick gently. We are aiming for an initial climb attitude of 15 degrees within about 5 seconds. The Flight Directors will guide you to the correct attitude. You can now engage Autopilot 1 (AP1).



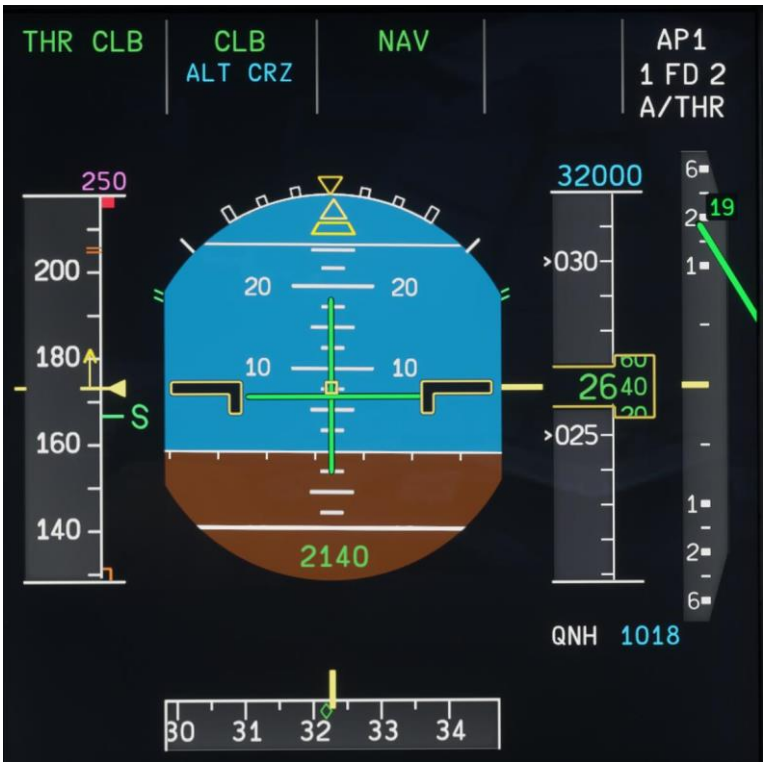
Once airborne with the aircraft positively climbing, raise the landing gear by selecting the Landing Gear Lever to the UP position. Confirmation the gear is moving will be indicated by the LDG GEAR position lights turning to the red UNLK position.


The next phase of the takeoff will accelerate the aircraft to its clean configuration and climb speed, normally 250 kts below 10,000 ft. The acceleration segment will normally happen between 1,000 and 1,500 ft above ground level. This can be set to automatically populate in the MCDU PERF page via the EFB. The Autopilot will automatically pitch down to achieve this acceleration. You will also note another change in the FMA ordering the thrust levers to be set to Climb power (LVR CLB) and flashing white. Vertical CLB and lateral NAV modes are now fully engaged (indicated in Green).




As the aircraft accelerates, an S or F (depending on takeoff flaps setting) will appear from the top of the speed tape on the PFD. Shortly thereafter, a red and black “barber’s pole” will indicate a maximum flight envelope speed, in this case our maximum Flaps speed in this configuration. The active speed mode will now be in Thrust Climb (THR CLB).

When accelerating above the S speed, raise the flaps by setting the Flap Lever to 0.



You can now complete the initial part of your climb check flow.

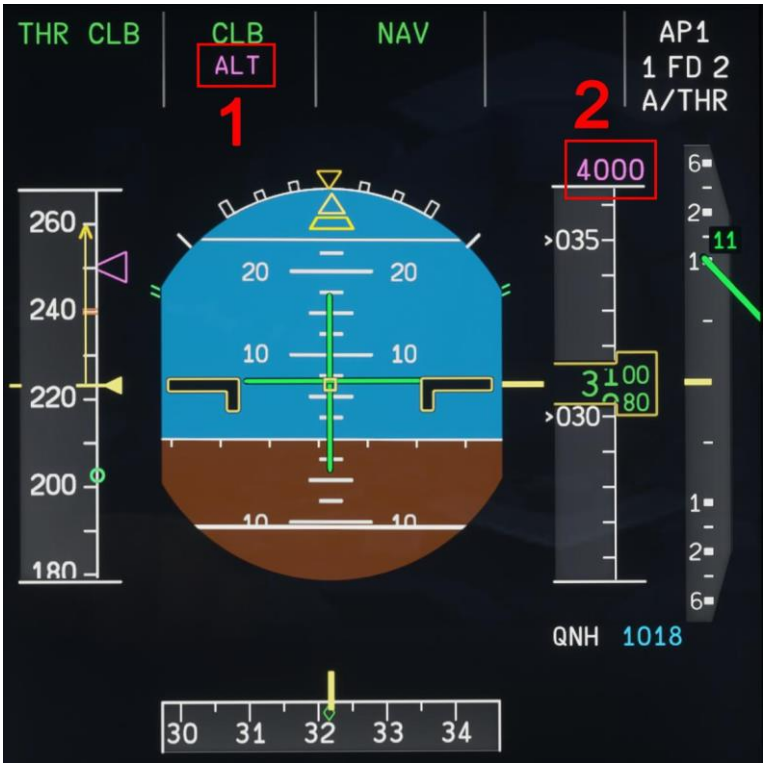
1) Disarm the speed brakes by pushing the lever in. Be careful not to deploy speed brakes, the aircraft will provide a warning if you do this.
2) Set the lights to the following:
    a. NOSE – OFF
    b. RWY TURN OFF – OFF

Now the aircraft is safely climbing to its cruise flight level.

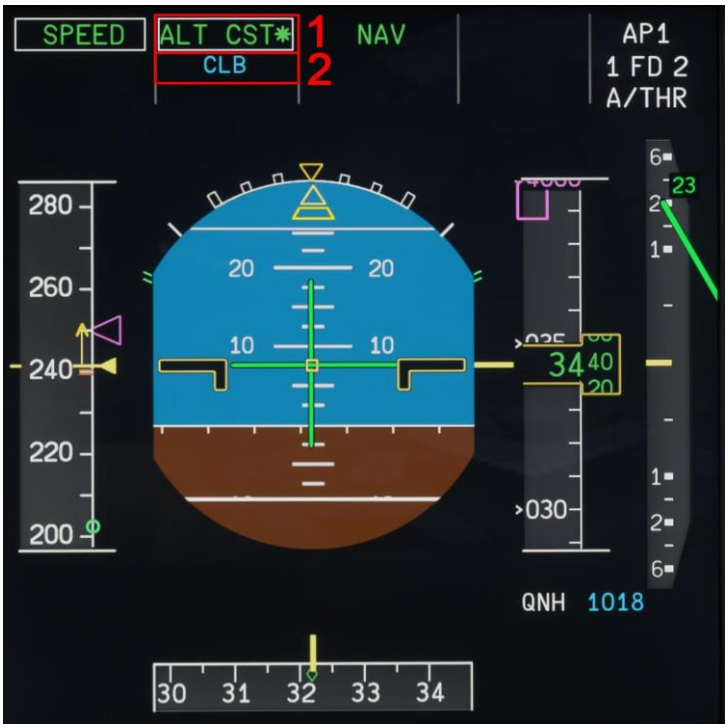
## Climb

You may sometimes be on a Standard Instrument Departure (SID) that has specific climb restrictions. The autopilot will temporarily stop the aircraft from climbing due to this restriction as long as you are in managed climb mode (CLB). This will be evident from a magenta altitude constraint on the PFD altitude tape and the FMA indicating Altitude Constraint (ALT CST) mode.

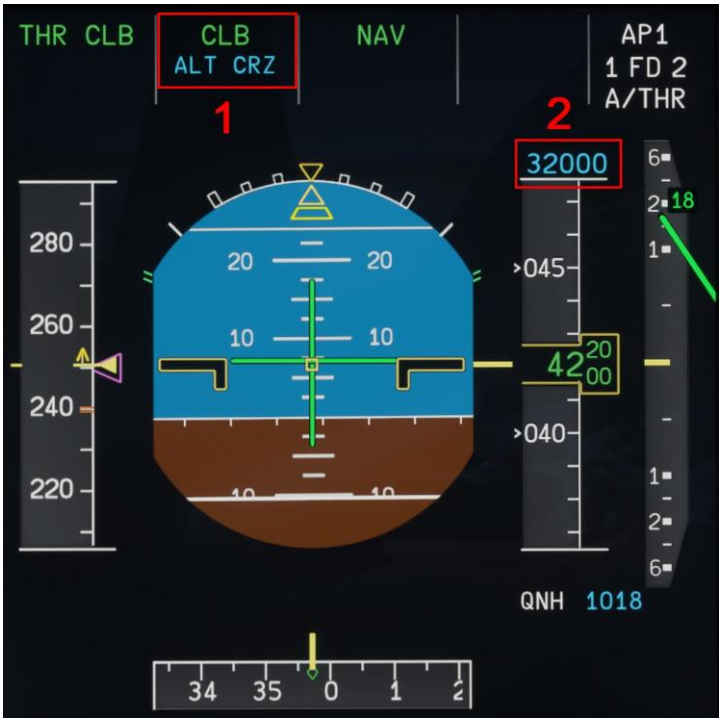
For demonstration purposes an altitude constraint of 4,000 ft has been entered at a waypoint. ALT has changed to magenta to indicate a level off will take place at a constraint (1). Even though the FCU altitude target is still set as 32,000 ft, the target value has changed to the constraint, 4,000 ft (2)



The aircraft is now leveling off, note that ALT CST* has engaged (1) and that CLB is armed (2) (blue color). This indicates that after the waypoint with the constraint is sequenced Climb will engage automatically and continue the climb without pilot intervention




The waypoint has now been sequenced, Climb mode has re-engaged and the altitude capture mode is back to our cruise level, ALT CRZ, matching the value set in the FCU (1).
Above the altitude tape the level off target altitude is back in blue (2)



Note: You can however override this automatic level off and continue a constant climb to your selected cruise altitude. To do this you would pull the altitude knob to 'take' control from the autopilot.


The aircraft will enter an Open Climb (OP CLB) as indicated by the FMA on the PFD. Once past the constraint you can 'give' back control to the autopilot by pushing the same selector.

The aircraft will now continue to the top of climb without any further interaction. You do, however, need to clean up the external lights and ensure the correct pressure setting is set.

Set Standard (STD) pressure (1013 hPa or 29.92 inHg) by pulling the baro selector knob when above the transition altitude.


Landing lights will be turned off above 10,000 ft and the passenger seat belt sign can also be set to Auto.

## Cruise

Few pilot actions need to be performed during the cruise phase of the flight other than monitoring the aircraft systems and tactically managing the guidance system. For demonstration / educational purposes, explore some of the functions:

You can use the MCDU to give the FMGES a waypoint to fly-to directly. These are effectively short cuts given by ATC to save time and fuel. The procedure is simple after some practice.

1) Select the Direct To (DIR) page on the MCDU (1).
2) Use the slew keys (2) up and down to find the desired waypoint. In our example this is BOKNO.
3) Press the line select key (3) next to BOKNO to enter it into the DIR TO.
4) Activate the DIR TO by pressing line select key L1 (4).

The aircraft will turn towards BOKNO automatically. You can confirm that the aircraft is navigating to the correct point by checking the TO waypoint on the ND.

## Approach Preparation

As with departure, you will need to prepare the FMGES for the arrival procedure into Detroit. This will provide the flight directors and autopilot with the information required to successfully guide the aircraft to the runway.
For this arrival you will follow a RNAV Initial Approach followed by a conventional Instrument Landing System (ILS) approach. You will execute a fully automatic landing using the autopilot. This is usually reserved for low visibility operations, and you can, of course, manually fly the landing if you desire.

To start preparing the FMGS press F-PLN page to ensure you are on the active route, and press line select key L6 next to LFBO.

Press line select key R1 to select the arrivals page.

And then press line select key L3 to select the ILS for Runway 05.

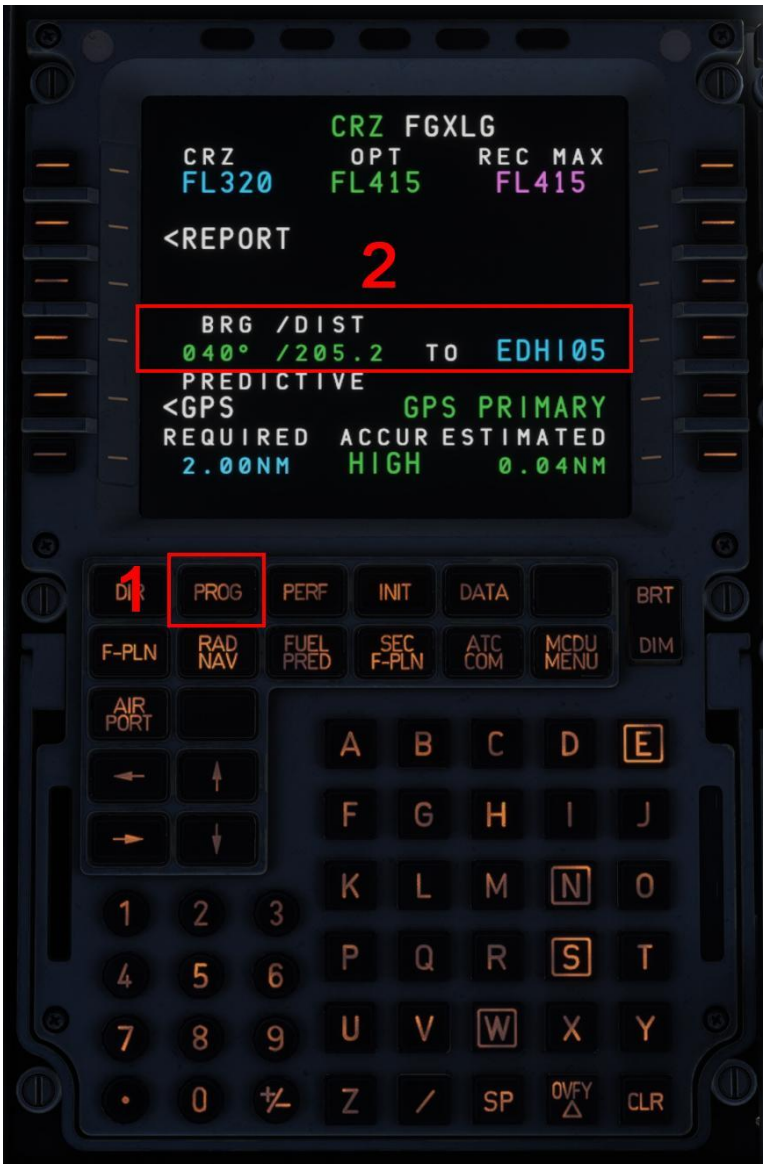
If the destination airport has any Standard Terminal Arrival Routes (STARs), they would be present in (1). EDHI does not have any STARs, this is why this area is blank. We will now press L2 to select the different waypoints that will link onto the ILS.


Using the scroll keys (1), look for RIBSO, then press L4 (2).


Press R6 to insert the approach.


You can check that the navigation data, in particular the ILS course and frequency, has been entered correctly by pressing the MCDU RAD NAV page button.
*Note – the ILS/FREQ and (ILS) CRS is only auto populated in the MCDU when the aircraft has less than 300 NM to go.*

To give us an idea of track mileage and direction to the airport we can enter a waypoint to give a constant bearing and distance. This is done by pressing the MCDU PROG (1) page button, entering the desired waypoint in the scratchpad, and then pressing line select key R4 (2).



Next, to help the FMGES vertical guidance path and estimations, you will insert the arrival airfield information in the MCDU PERF page (1). Cycle through the available Next Phase pages using line select key R6 until you reach the APPR (3) page.
Enter the information required at line select L1 to 3 by entering it into the MCDU scratchpad and then pressing the requisite line select key. This information can be found on the EFB Flight Details page. Pressing the Update Button will provide the most recent live weather.

Insert all the weather information as per the ATIS/METAR and the decision altitude in the BARO field. If you are doing a CAT II or CAT III approach you will be inserting a decision height in the RADIO field.

With all the PERF data entered, your page should look similar to the following:


You should also consider the length of runway available and how you are going to stop the aircraft after touching down. The aircraft uses a combination of deceleration devices including spoilers, thrust reversers, and wheel brakes to decelerate. The runway in Finkenwerder is long enough so you can safely use a low autobrake setting. Press the Auto Brake LO button.

You should be approaching the top of descent at this point, indicated by the small white arrow along the flight plan lateral path.

## Descent

You can initiate a descent once the aircraft is within a few nautical miles of the descent arrow. The FMGS requires two parameters to commence the descent:

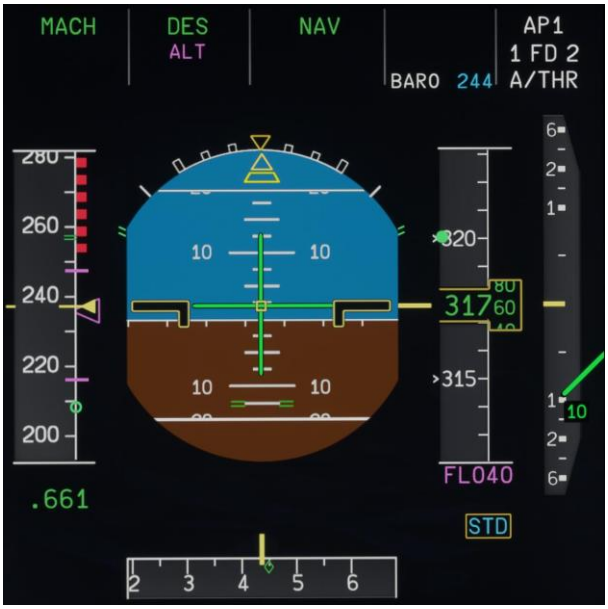
1) An altitude target
2) Descent profile

Normally, ATC dictates descents as a series of 'step downs', but for the purpose of this guide, you will set your final approach fix altitude. For the ILS05, this is 3,000 ft.

Set the FCU altitude to 3,000 ft.


To begin the aircraft's descent, push the knob to enter managed descent mode.

The PFD will display the following:




Waypoint HI255 in the Initial Approach has a minimum altitude, it has to be passed above 4,000 ft. ALT is magenta and the target altitude is FL040 (4,000 ft, shown as a Flight Level now because our altimeter reference is Standard), this indicates that the aircraft will level off at 4,000 ft to satisfy the altitude constraint.

A constraint with a + indicates that you must remain above the level, a constraint with a – indicates that you must remain below the level, and a constraint with just a level indicates you should pass that waypoint at that level exactly.

When descending through 10,000 feet, set the landing switches to ON and the seat belt signs to ON. The autopilot should automatically reduce speed to 250 kts. Select the Landing System (LS) push buttons to ON to provide pilot and autopilot guidance.


If you find the aircraft is too high above the desired descent trajectory, indicated by a small green dot gradually moving below the current altitude, you can apply speed brakes. Set them to half initially to see if this reduces the error.

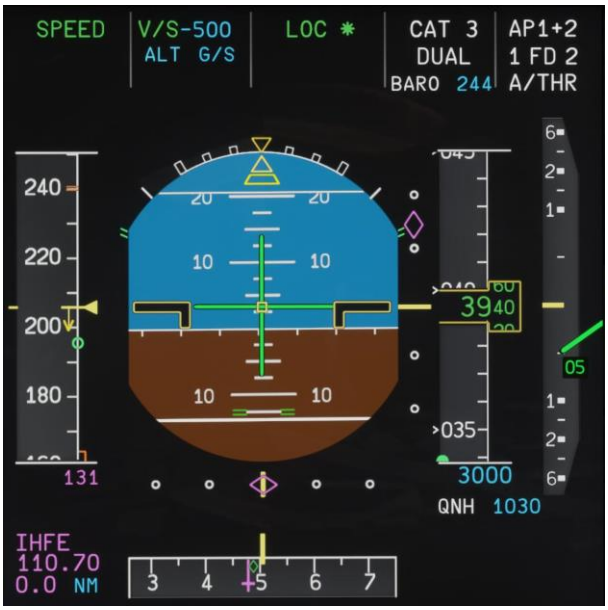
Set QNH by pressing the baro selector knob when below the transition level.


## Approach

We will arm the approach by first pressing the APPR button (1) when we are on an intercept heading for the ILS. After pressing APPR select the other autopilot as well (2).

You should also activate the approach phase by pressing line select key L6. The FMGS will automatically initiate this phase when flying over the approach deceleration point indicated by a magenta D on the flight plan.

The FMA will display several items of information. During the approach, focus primarily on lateral and vertical modes having armed and captured the ILS.
Also note that the aircraft has indicated that it has a Category (CAT) 3 Dual approach capability, meaning that it can fully Autoland.
The ILS identifier, frequency, and distance to go (DME) is indicated on the lower-left of the PFD.
The localizer and glide slope deviation bars indicate vertical and lateral track referenced against the ILS ground signal.
Currently, the Localizer is being captured (LOC* green) and the Glide Slope is armed (G/S blue).



Prior to intercepting the final approach slope, begin decelerating the aircraft to its final approach speed. You need to consider two speeds as the aircraft decelerates through the approach phases. The VFE Next, indicated by orange stripes, and the current minimum speed, based on the aircraft's configuration. The aircraft's speed must be below VFE Next to avoid an overspeed situation.


1) Vfe next (=) will change as we extend the flaps

2) The minimum speed will depend on the configuration
    a) (o) Green dot: minimum speed clean
    b) (S) S-Speed: minimum speed CONF1
    c) (F) F-Speed: minimum speed CONF2 & 3

After Flaps 2, select the gear down, which will contribute to the aircraft's deceleration while descending along the glide path. Arm the spoilers by pulling on the speed brake lever.

Once below 2,000 ft and in landing configuration, the landing memo will be displayed to confirm that the aircraft is ready for landing.


The aircraft will now complete an automatic landing and rollout, bringing the aircraft to a complete stop. You will be prompted at approximately 20 ft to 'Retard' the throttles; move the throttle controls to the idle position or press F1 on your keyboard. Once the main wheels have contacted the runway you can select reverse thrust by pressing F2, or if calibrated via the EFB, the reverse thrust range on your throttles. Cancel reverse thrust at approximately 60-70 kts by pressing F1 again or returning your throttles to idle. The aircraft will automatically complete the process and bring you to a complete stop on the runway.

If you want to intervene before reaching a complete stop, disconnect the autopilot by pressing the button on the side stick (1) or in your joystick. You will also need to press the brakes to manually take control of braking again.

Congratulations! You have completed the flight. You may now taxi the aircraft to an available parking stand and follow the in-sim checklist to shut down and secure the aircraft, or use the following simplified procedural checklist:

## Simplified Procedures

| Preliminary Cockpit Preparation | |
|---|---|
| Engine Master 1&2 | OFF |
| Engine Start Selector | NORM |
| | |
| **WEATHER RADAR** | |
| Radar (SYS) | OFF |
| Predictive Windshear (PWS) | OFF |
| Gain Knob | AS REQD |
| Mode Selector | AS REQD |
| | |
| Landing Gear Lever | DOWN |
| Wiper Selectors | BOTH OFF |
| Battery 1, 2 & APU | CHECK VOLTAGE |
| External Power A & B | ON & AUTO |
| APU Fire | CHECK |
| APU Agent Light | OFF |
| APU Fire Test | PRESS AND HOLD |
| | |
| **APU START** | |
| APU Master Switch | ON |
| APU Start | PRESS |
| Monitor APU Start | WAIT |
| External Power A & B | AS REQD |
| | |
| **AIR CONDITIONING PANEL** | |
| APU Bleed | ON |
| All White Lights | OFF |

| | |
|---|---|
| X-BLEED | AUTO |
| Cockpit and Cabin Temperatures | AS REQD |
| | |
| **CARGO AIR CONDITIONING PANEL** | |
| Temperature | AS REQD |
| All Cargo White Lights | OFF |
| | |
| Cockpit Lights | AS REQD |
| EFB | ON |
| | |
| **FMGS PRE-INITIALIZATION** | |
| Engine and Aircraft Type | CHECK |
| Database Validity | CHECK |
| Flight Number | INSERT |
| FROM/TO | INSERT OR REQUEST (SIMBRIEF) |
| | |
| **PRELIMINARY PERFORMANCE** | |
| Airfield Data | OBTAIN |
| Weight and Balance Data | INSERT |
| Preliminary Takeoff Performance | COMPUTE ON EFB |
| | |
| **ECAM PAGES** | |
| DOOR SD Page | CHECK |
| HYD SD Page | CHECK |
| ENG SD Page | CHECK |
| | |
| Flaps | CHECK |
| Speed Brake Lever | CHECK |
| ACCU Pressure Indicator | CHECK |

| | |
|---|---|
| Park Brake Handle | CHECK |
| Brakes Pressure Indicator | CHECK |
| | |
| **ALTERNATE BRAKING SYSTEM** | |
| Chocks | CHECK |
| Park Brake Handle | OFF |
| Brake Pedals | PRESS |
| Brake And Accumulator Pressure Indicator | CHECK |
| Brake Pedals | RELEASE |
| Park Brake Handle | ON |
| | |
| Emergency Equipment | CHECK |
| Landing Gear Pins and Covers | CHECK |

| | |
|---|---|
| **Cockpit Preparation** | |
| All White Lights OFF | CHECK |
| RCDR GND CTL | ON |
| Evac CPT and PURS/CPT Switch | AS REQD |
| ADIRS All IR Mode | NAV |
| | |
| **EXTERIOR LIGHTS** | |
| Strobe | AUTO |
| Beacon | OFF |
| Wing | OFF |
| NAV & Logo | LT1 |
| RWY Turn Off | OFF |
| Landing light | OFF |
| Nose | OFF |

| | |
|---|---|
| | |
| Seat Belts | ON |
| No Smoking | AUTO |
| Emer Exit Light | ARM |
| Probe/Window Heat | AUTO |
| Landing Elevation | AUTO |
| Manual Valve Set | BOTH |
| Pack Flow | AS REQD |
| | |
| **BATTERY CHARGE CYCLE** | |
| ELEC SD Page | PRESS |
| Battery 1, 2 & APU Battery | OFF THEN ON |
| ELEC SD Page | CHECK |
| | |
| Trim Tank Mode | AUTO |
| Trim Tank Feed | AUTO |
| Fuel Pumps | ON |
| | |
| Engine 1&2 Fire | CHECK |
| Agent 1&2 Lights | OFF |
| ENG Test | PRESS AND HOLD |
| Maintenance Panel | CHECK |
| Vent Panel | CHECK |
| COM 3 | RECEPT |
| | |
| **ISIS CHECK** | |
| Brightness | ADJUST |
| IAS, ALT Readings | CHECK |
| Attitude | CHECK |

| | |
|---|---|
| | |
| North Ref | OFF |
| DMC Selector | AUTO |
| ECAM ND Selector | NORM |
| Clock | SET |
| LDG Gear Gravity Extn Selector | OFF |
| A/Skid & N/W Steering Switch | ON |
| | |
| **CPT & FO RADIO MGMT PANEL (RMP)** | |
| CPT RMP | ON |
| CPT Green Nav Light | OFF |
| CPT SEL Light | OFF |
| CPT Comm Frequencies | TUNE |
| FO RMP | ON |
| FO Green Nav Light | OFF |
| FO SEL Light | OFF |
| FO Comm Frequencies | TUNE |
| | |
| **CPT & FO AUDIO CONTROL PANEL (ACP)** | |
| CPT INT Knob | CHECK |
| CPT VHF Knob | CHECK |
| FO INT Knob | CHECK |
| FO VHF Knob | CHECK |
| | |
| ACCU PRESS Indicator | CHECK |
| Park Brake Handle | ON |
| Brake PRESS Indicator | CHECK |
| Cockpit Door | CHECK |

| | |
|---|---|
| Switching Panel | NORM |
| Thrust Lever | IDLE |
| Thrust Reverser Lever | STOWED |
| Engine Master Switch | OFF |
| Engine Start Selector | NORM |
| ATC Mode Selector | STBY |
| ALT RPTG | ON |
| XPDR Selector | SYS 1 |
| NAV Charts | PREPARE |
| | |
| **FMGS PREPARATION** | |
| INIT Key | PRESS |
| FROM/TO | CHECK OR REQUEST |
| ALTN | CHECK OR MODIFY |
| Flight Number | CHECK OR ENTER |
| Cost Index | ENTER |
| CRZ FL | ENTER |
| CRZ FL Temp | CHECK |
| | |
| **FLIGHT PLAN (PAGE:A)** | |
| Departure Airfield | PRESS |
| Departure Information | SELECT |
| INSERT | PRESS |
| Route as Required | CHECK OR ENTER |
| INSERT | PRESS |
| Arrival Airfield | PRESS |
| Arrival Information | SELECT |
| INSERT | PRESS |
| Winds | AS REQD |

| | |
|---|---|
| | |
| Secondary Flight Plan | AS REQD |
| Radio NAV | CHECK / SET |
| Calculate Weight / Perf | ON EFB |
| | |
| **GROSS WEIGHT INSERTION (PAGE: INIT B)** | |
| ZFW/ZFWCG | INSERT |
| Block Fuel | INSERT |
| | |
| **TAKEOFF DATA INSERTION (PAGE: PERF)** | |
| T.O. SHIFT | AS REQD |
| V1, VR, V2 | INSERT |
| FLEX TO Temp | INSERT |
| THR RED/ACC Altitude | CHECK / SET |
| ENG Out ACC Altitude | CHECK / SET |
| Flaps/THS | INSERT |
| Next Phase | PRESS |
| Preset Speeds (PERF Pages) | As REQD |
| | |
| Loudspeaker | SET |
| Barometric Pressure | SET ALL |
| FD 1/2 | ON |
| LS 1/2 | AS REQD |
| ND Mode Range | AS REQD |
| ADF/VOR Selector | AS REQD |
| SPD Mach Window | CHECK |
| HDG-VS / TRK-FPA Push Button | CHECK |
| ALT Window | SET |
| | |

| | |
|---|---|
| **REGUL LO PR IND (CHECK NOT DISPLAYED)** | |
| DOOR/OXY SD Page | CHECK |
| | |
| EFIS DMC Selector | NORM |
| PFD/ND Brightness | CHECK |
| PFD | CHECK |
| ND | CHECK |
| | |
| **SD PAGE PUSH BUTTON (PRESS)** | |
| PRESS SD Page | CHECK |
| | |
| **STS PAGE PUSH BUTTON (PRESS)** | |
| INOP SYS Display | CHECK |
| | |
| IRS Align | CHECK |
| Takeoff Briefing | PERFORM |

| Before Pushback or Start | |
|---|---|
| Final Loadsheet | CHECK |
| ZFW/ZFWCG | CHECK/REVISE |
| Loadsheet CG and ECAM CG | CHECK |
| Fuel On Board (FOB) | CHECK |
| Final Takeoff Perf Data | RECOMPUTE |
| FMS Takeoff Data | REVISE |
| Seating Position | ADJUST |
| FMS Perf TO Page | SELECT CAPT SIDE |
| FMS F-PLN Page | SELECT FO SIDE |
| EXT PWR | CHECK |
| EXT PWR Disconnection | REQUEST |
| *Complete BEFORE ENGINES START CHECKLIST TO THE LINE.* | |

| Before Engine Start Checklist (To The Line) | |
|---|---|
| Cockpit Prep | COMPLETED |
| ACARS INIT | COMPLETED |
| Gear Pins and Covers | REMOVED |
| Signs | ON/AUTO |
| ADIRS | NAV |
| Fuel Quantity | CHECK |
| TO Data | SET |
| Baro Ref | SET |

| Before Engine Start | |
|---|---|
| Pushback/Start-Up Clearance | OBTAIN |
| ATC | SET |
| | |
| **WINDOWS AND DOORS** | |
| CPT Window | CLOSED |
| FO Window | CLOSED |
| Doors | CLOSED |
| Flight Deck Door | CLOSED |
| | |
| Slides | ARMED |
| Beacon Switch | ON |
| Thrust Levers | IDLE |
| Accu Press Indicator | CHECK |
| Park Brake Handle | ON |
| NW STRG DISC Memo | DISPLAYED |
| *Complete BEFORE ENGINES START CHECKLIST BELOW THE LINE* | |

| Before Engine Start (Below The Line) | |
|---|---|
| Flight Deck Door | CLOSED |
| Windows/Doors | CLOSED |
| Beacon | ON |
| Thrust Levers | IDLE |
| Parking Brake | AS REQD |
| Transponder | AS REQD |

| Engine Start | |
|---|---|
| Engine Start Selector | IGN START |
| Engine 1 Start | ANNOUNCE |
| Engine 1 Master | ON |
| Engine Idle Parameters | CHECK |
| Engine 2 Start | ANNOUNCE |
| Engine 2 Master | ON |
| Engine Idle Parameters | CHECK |

| After Engines Start | |
|---|---|
| Engine Start Selector | NORM |
| APU Bleed | OFF |
| ENG Anti-Ice | AS REQD |
| Wing Anti-Ice | AS REQD |
| APU Master Switch | OFF |
| NWS Towing Fault Light | OFF |
| Ground Spoilers | ARM |
| | |
| **RUDDER TRIM POSITION (CHECK)** | |
| RESET Push Button | PRESS |
| | |
| Flaps Lever | SET |
| Flaps | CHECK |
| Pitch Trim | CHECK |
| | |
| **ECAM (CHECK)** | |
| STS Push Button | PRESS AND REVIEW |

| | |
|---|---|
| Nose Wheel Steering Disc Memo | CHECK |
| Ground Crew Cleared to Disconnect | ANNOUNCE |
| *Complete AFTER START CHECKLIST.* | |

| **After Start Checklist** | |
|---|---|
| Anti-Ice | AS REQD |
| ECAM Status | CHECKED |
| Pitch Trim | CHECKED |
| Rudder Trim | ZERO |
| Ground Equipment | CLEAR |

| **Taxi-Out** | |
|---|---|
| Taxi Clearance | OBTAIN |
| Nose Light | TAXI |
| RWY Turn off | AS REQD |
| Parking Brake | OFF |
| Brakes Pressure | ZERO |
| Thrust Levers | AS REQD |
| Brake Pedals | PRESS |
| Brakes | CHECK |
| Brakes Pressure | ZERO |
| Tiller or Rudder Pedals | AS REQD |
| Flight Controls | CHECK |
| ATC Clearance | CONFIRM |
| | |
| **FMS DATA (CONFIRM)** | |

| | |
|---|---|
| F-PLN (SID, TRANS) | REVISE OR CHECK |
| Initial Climb Speed and Speed Limit | REVISE OR CHECK |
| Cleared Altitude on FCU | SET |
| Heading on FCU | AS REQD |
| | |
| Both FD | ON |
| PFD/ND | CHECK |
| Takeoff Briefing | CONFIRM |
| Radar | ON |
| Predictive Windshear System (PWS) | AUTO |
| ATC (Transponder) Code/Mode | CONFIRM SET |
| TERR on ND | AS REQD |
| Auto Brake MAX | ON |
| T.O. CONFIG | TEST |
| T.O. MEMO | CHECK |
| Cabin Report | RECEIVED |
| *Complete BEFORE TAKEOFF CHECKLIST TO THE LINE.* | |

| **Before Take Off Checklist (To The Line)** | |
|---|---|
| Flight Controls | CHECKED |
| Flight Instruments | CHECKED |
| Briefing | CONFIRMED |
| Flaps Setting | CONFIRM |
| V1, Vr, V2/Flex Temp | ANNOUNCE |
| ATC (Transponder) | SET |
| | |
| **ECAM MEMO (TO NO BLUE)** | |

| | |
|---|---|
| Signs | ON |
| SPLRS | ARMED |
| Flaps | T.O. |
| Auto BRK | MAX |
| T.O. CONFIG | NORM |

| **Runway Line-Up** | |
|---|---|
| **BRAKE FANS (CHECK)** | |
| Brake Temperature | CHECK |
| | |
| Line-up or Takeoff Clearance | Obtain |
| Strobe | ON |
| TCAS | TA/RA |
| Approach Path | CLEAR |
| Cabin Crew | ADVISE |
| Engine Start | AS REQD |
| Sliding Tables | STOW |
| Takeoff Runway | CONFIRM |
| PACK1 and PACK2 | AS REQD |
| *Complete BEFORE TAKEOFF CHECKLIST BELOW THE LINE.* | |

| Before Take Off Checklist (Below The Line) | |
|---|---|
| Take Off Runway | CONFIRMED |
| Cabin Crew | ADVISED |
| TCAS | SET |
| Engine Start Selector | AS REQD |
| PACKS | AS REQD |

| Takeoff | |
|---|---|
| Takeoff Clearance | OBTAIN |
| Nose Light | T.O. |
| RWY Turn Off Lights | ON |
| Landing Lights | ON |
| “Takeoff” | ANNOUNCE |
| Thrust Levers | SET |
| | |
| **SIDESTICK (CHECK)** | |
| If Crosswind is below 20 KTS and no tailwind | APPLY HALF FORWARD SIDE STICK UNTIL 80 KTS MOVE TO NEUTRAL BY 100 KTS |
| If Crosswind is greater than 20 KTS or tailwind | APPLY FULL FORWARD SIDESTICK UNTIL 80 KTS MOVE TO NEUTRAL BY 100 KTS |
| | |
| Brakes | RELEASE |
| Thrust Levers | FLX OR TOGA |
| Directional Control | AS REQD |
| Chrono | START |
| PFD/ND | MONITOR |
| FMA | ANNOUNCE |
| Takeoff EPR/N1 | CHECK |

| | |
|---|---|
| “Thrust Set” | ANNOUNCE |
| PFD And ENG Indications | MONITOR |
| “One Hundred Knots” | ANNOUNCE |
| V1 | MONITOR OR ANNOUNCE |
| At VR Rotation | ORDER |
| Rotation | PERFORM |
| “Positive Climb” | ANNOUNCE |
| “Landing Gear Up” | ORDER |
| Landing Gear | UP |
| Autopilot | AS REQD |
| | |
| **THRUST REDUCTION** | |
| Thrust Levers | CL (CLIMB) |
| PACK1 and PACK2 (If Applicable) | ON |
| | |
| **AT ACCELERATION ALTITUDE (CHECK)** | |
| At F Speed Flaps 1 | ORDER |
| Flaps 1 | SELECT |
| At S Speed Flaps 0 | ORDER |
| Flaps 0 | SELECT |
| Ground Spoilers | DISARM |
| Nose Light | OFF |
| RWY TURN OFF Lights | OFF |
| Other Exterior Lights | AS REQD |

| After Takeoff | |
|---|---|
| APU Bleed | OFF |
| APU Master | OFF |
| TCAS | TA/RA |
| Engine Anti-Ice | AS REQD |
| Wing Anti-Ice | AS REQD |
| *Complete CLIMB CHECKLIST TO THE LINE* | |

| Climb Checklist (To The Line) | |
|---|---|
| Landing Gear | UP |
| Flaps | RETRACTED |
| Packs | ON |

| Climb | |
|---|---|
| PF MCDU | PERF CLB |
| PM MCDU | F-PLN |
| Barometric Reference | SET |
| CRZ FL | AS REQD |
| ENG Anti-Ice | AS REQD |
| *Complete CLIMB CHECKLIST BELOW THE LINE* | |

| Climb Checklist Below The Line | |
|---|---|
| Baro Ref | SET |

| **Above FL100/10,000 FT** | |
|---|---|
| Landing Lights | OFF |
| Seat Belts | AS REQD |
| EFIS Option | AS REQD |
| ECAM Memo | REVIEW |
| NAVAIDS | CLEAR |
| SEC F-PLN | AS REQD |
| OPT/MAX ALT | CHECK |

| Top Of Climb / Cruise | |
|---|---|
| ECAM Memo | REVIEW |
| | |
| **ECAM SD PAGES (REVIEW)** | |
| ENG | REVIEW |
| BLEED | REVIEW |
| ELEC | REVIEW |
| HYD | REVIEW |
| COND | REVIEW |
| DOOR | REVIEW |
| F/CTL | REVIEW |
| FUEL | REVIEW |
| | |
| Flight Progress | CHECK |
| Step Flight Level | AS REQD |
| NAV Accuracy | MONITOR |
| Radar Tilt | ADJUST |

| Descent Preparation | |
|---|---|
| Weather and Landing Information | OBTAIN |
| NAV Charts | PREPARE |
| | |
| **ARRIVAL PAGE (CHECK)** | |
| Lateral Revision (LSK By The Arrival Airport) | SELECT |
| APPR, STAR, TRANS and APPR VIA | ENTER |
| | |
| F-PLN A Page | CHECK |
| DES Wind Page | CHECK / ENTER |
| PERF CRUISE Page | CHECK |
| PERF DES Page | CHECK |
| | |
| **PERF APPR PAGE (CHECK)** | |
| QNH, Temperature and Wind at Destination | ENTER |
| Minimum | INSERT |
| Landing Config (Flaps) | AS REQD |
| Transition Altitude | AS REQD |
| | |
| **PERF GO-AROUND PAGE (CHECK)** | |
| THR RED ALT and ACC ALT | AS REQD |
| | |
| **RADIO NAV PAGE (CHECK)** | |
| Set NAVAIDS | AS REQD |
| | |
| SEC F-PLN Page | AS REQD |
| FMS Preparation | CHECK |
| LDG ELEV | CHECK |

| | |
|---|---|
| | |
| **AUTO BRK (CHECK)** | |
| On Short or Contaminated Runways | MED |
| On Long Runways | LOW |
| | |
| Approach Briefing | CONFIRM |
| TERR ON IND | AS REQD |
| Radar | ADJUST |
| Engine Anti-Ice | AS REQD |
| Wing Anti-Ice | AS REQD |
| Descent Clearance | OBTAIN |
| Cleared Altitude on FCU | SET |

## Descent

| | |
|---|---|
| **DESCENT (INITIATE)** | |
| Push ALT on FCU | MANAGED DESCENT |
| Pull ALT on FCU | OPEN DESCENT |
| | |
| PF MCDU | PROG/PERF PAGE |
| PM MCDU | F-PLN |
| Descent | MONITOR |
| Barometric Reference | SET |
| ECAM Status | CHECK |

| Below FL100/10,000 FT | |
|---|---|
| Land Lights | ON |
| Seat Belts | ON |
| EFIS Option | CSTR |
| LS | AS REQD |
| RAD NAVAIDS | SELECT |
| Engine Start Selector | AS REQD |
| NAV Accuracy | CHECK |
| *Complete APPROACH CHECKLIST* | |

| Approach Checklist | |
|---|---|
| Briefing | CONFIRMED |
| ECAM Status | CHECKED |
| Seat Belts | ON |
| Baro Ref | SET |
| Minimum | SET |
| Engine Start Selector | AS REQD |

| Initial Approach | |
|---|---|
| F-PLN Sequencing | ADJUST |
| | |
| **APPROACH PHASE (CHECK)** | |
| If Aircraft Flies Over DECEL Pseudo Waypoint | CHECK |
| | |
| **MANAGED SPEED (CHECK)** | |
| If ATC Requires Specific | CHECK |

| | |
|---|---|
| Flight Path | MONITOR |
| Speed Brakes | AS REQD |
| Radar | ADJUST |
| NAV Accuracy | MONITOR |

| **Intermediate / Final Approach** | |
|---|---|
| TCAS Mode Selector | TA/RA |
| Flaps 1 | ORDER |
| Flaps 1 | SELECT |
| Flaps 2 | ORDER |
| Flaps 2 | SELECT |
| Landing Gear Down | ORDER |
| Landing Gear Lever | SELECT |
| Auto Brake | CONFIRM |
| Ground Spoilers | ARM |
| Nose Light | T.O. |
| RWY Turn Off Lights | ON |
| Flaps 3 | ORDER |
| Flaps 3 | SELECT |
| ECAM WHEEL SD Page | CHECK |
| Flaps Full | ORDER |
| Flaps Full | SELECT |
| A/THR | CHECK |
| Wing Anti-Ice | OFF |
| Sliding Table | STOW |
| Cabin Crew | ADVISE |
| Cabin Report | RECEIVE |

| | |
|---|---|
| LDG Memo | CHECK |

| **ILS Approach (LOC/GS)** | |
|---|---|
| Approach Minimum | DETERMINE |
| APPR Push Button on FCU | PRESS |
| Both Autopilots | ENGAGE |
| LOC (Blue) | ARMED |
| G/S (Blue) | ARMED |
| LOC Capture | MONITOR |
| G/S Capture | MONITOR |
| Go-Around Altitude | SET |
| Land Mode | ENGAGED/ANNOUNCE |
| One Hundred Above | MONITOR OR ANNOUNCE |
| Minimum | MONITOR OR ANNOUNCE |
| | |
| **IF VISUAL REFS ARE SUFFICIENT (CHECK)** | |
| Continue | ANNOUNCE |
| Autopilot | AS REQD |
| | |
| **IF VISUAL REFS NOT SUFFICIENT (CHECK)** | |
| Go-Around | PERFORM |

| RNAV Approach | |
|---|---|
| For RNAV (GNSS) Approaches | CHECK |
| | |
| **PROG PAGE (CHECK)** | |
| Reference RWY in BRG/DIST Field | INSERT |
| | |
| APPR Push Button on FCU | AS REQD |
| APP NAV (Blue or Green) | ARMED/ENGAGED |
| | |
| **FINAL (BLUE)** | |
| PFD | CHECK |
| Blue Arrow on ND | CHECK |
| | |
| Final APP | ENGAGED |
| Go-Around Altitude | SET |
| One Hundred Above | MONITOR OR ANNOUNCE |
| Minimum | MONITOR OR ANNOUNCE |
| | |
| **IF VISUAL REFS ARE SUFFICIENT (CHECK)** | |
| Continue | ANNOUNCE |
| Autopilot | OFF |
| Flight Director | OFF |
| TRK FPA | SELECT |
| Runway Track | SET |
| | |
| **IF VISUAL REFS NOT SUFFICIENT (CHECK)** | |
| Go-Around | PERFORM AS REQD |

| Non-Precision Approach (TRK/FPA) | |
|---|---|
| **LATERAL GUIDANCE MODE (CHECK)** | |
| Use NAV | AS REQD |
| Use LOC | AS REQD |
| LOC Push Button | AS REQD |
| LOC / LOC B/C | ARMED |
| | |
| Lateral Path | INTERCEPT |
| TRK-FPA Push Button (BIRD) | SELECT |
| FPA for Final Approach | SET |
| FPA Selector | PULL |
| FPA Mode | ENGAGED |
| Go-Around Altitude | SET |
| One Hundred Above | MONITOR OR ANNOUNCE |
| Minimum | MONITOR OR ANNOUNCE |
| | |
| **IF VISUAL REFS ARE SUFFICIENT (CHECK)** | |
| Continue | ANNOUNCE |
| Autopilot | OFF |
| Flight Director | OFF |
| TRK FPA | SELECT |
| Runway Track | SET |
| | |
| **IF VISUAL REFS NOT SUFFICIENT (CHECK)** | |
| Go-Around | PERFORM AS REQD |

| Landing Checklist | |
|---|---|
| Cabin Crew | ADVISED |
| Auto Thrust | AS REQUIRED |
| Autobrake | AS REQUIRED |
| Missed Approach Altitude | SET |
| ECAM Memo | CHECK |

| Go-Around | |
|---|---|
| Thrust Levers | TOGA |
| Rotation | PERFORM |
| Go-Around | ANNOUNCE |
| Flaps Lever | RETRACT ONE STAGE |
| FMA | ANNOUNCE |
| Positive Climb | ANNOUNCE |
| Landing Gear Up | ORDER |
| Landing Gear | SELECT |
| NAV or HDG Mode | AS REQD |
| Autopilot | AS REQD |
| Thrust Levers | CL |
| At F Speed Flaps 1 | ORDER |
| Flaps 1 | SELECT |
| At S Speed Flaps 0 | ORDER |
| Flaps 0 | SELECT |
| Ground Spoilers | DISARM |
| Nose Light | OFF |
| RWY TURN OFF Lights | OFF |
| *Follow missed approach procedure* | |

| |
|---|
| *Complete CLIMB CHECKLIST TO THE LINE* |

| **After Landing** | |
|---|---|
| Ground Spoilers | DISARM |
| Landing Lights Switch | OFF |
| Strobe Lights | AUTO |
| Nose Light | TAXI |
| Other Exterior Lights | AS REQD |
| Radar | OFF |
| Predictive Windshear System (PWS) | OFF |
| ENG Start Selector | NORM |
| Flaps | Retract |
| TCAS | STBY |
| ATC | AS REQD |
| APU | START |
| Anti-Ice | AS REQD |
| Brake Temperature | CHECK |
| Brake Fans | AS REQD |
| *Complete AFTER LANDING CHECKLIST* | |

| After Landing Checklist | |
|---|---|
| Flaps | RETRACTED |
| Spoilers | DISARMED |
| APU | START |
| Radar | OFF |
| Predictive Windshear System | OFF |

| Parking | |
|---|---|
| ACCU PRESS Indicator | CHECK |
| Park Brake Handle | ON |
| Brakes PRESS Indicator | CHECK |
| Anti-Ice | OFF |
| APU Bleed Push Button | ON |
| All Engine Masters | OFF |
| Slide Disarmed | CHECK |
| Seat Belt Switch | OFF |
| Beacon Lights | OFF |
| Other Exterior Lights | AS REQD |
| Fuel Pumps | OFF |
| ATC | STBY |
| *Complete PARKING CHECKLIST.* | |

| Parking Checklist | |
|---|---|
| APU Bleed | ON |
| Engines | OFF |
| Seat Belts | OFF |
| Exterior Lights | AS REQUIRED |
| Fuel Pumps | OFF |
| Park Brake and Chocks | AS REQUIRED |
| Transponder | AS REQUIRED |

| Securing Aircraft | |
|---|---|
| Park Brake | ON |
| Oxygen Crew Supply Push Button | OFF |
| ALL IR Mode Selectors | OFF |
| Exterior Lights | OFF |
| APU Bleed Push Button | OFF |
| EXT PWR Push Button | OFF |
| APU Master Switch | OFF |
| Emergency Exit Light Switch | OFF |
| Signs Switches | OFF |
| BATT 1, 2 & APU | OFF |
| *Complete SECURING AIRCRAFT CHECKLIST.* | |

| Securing Aircraft Checklist | |
|---|---|
| ADIRS | OFF |
| Oxygen | OFF |

| | |
|---|---|
| APU Bleed | OFF |
| Emergency Exit Lights | OFF |
| Signs | OFF |
| APU and Batteries | OFF |