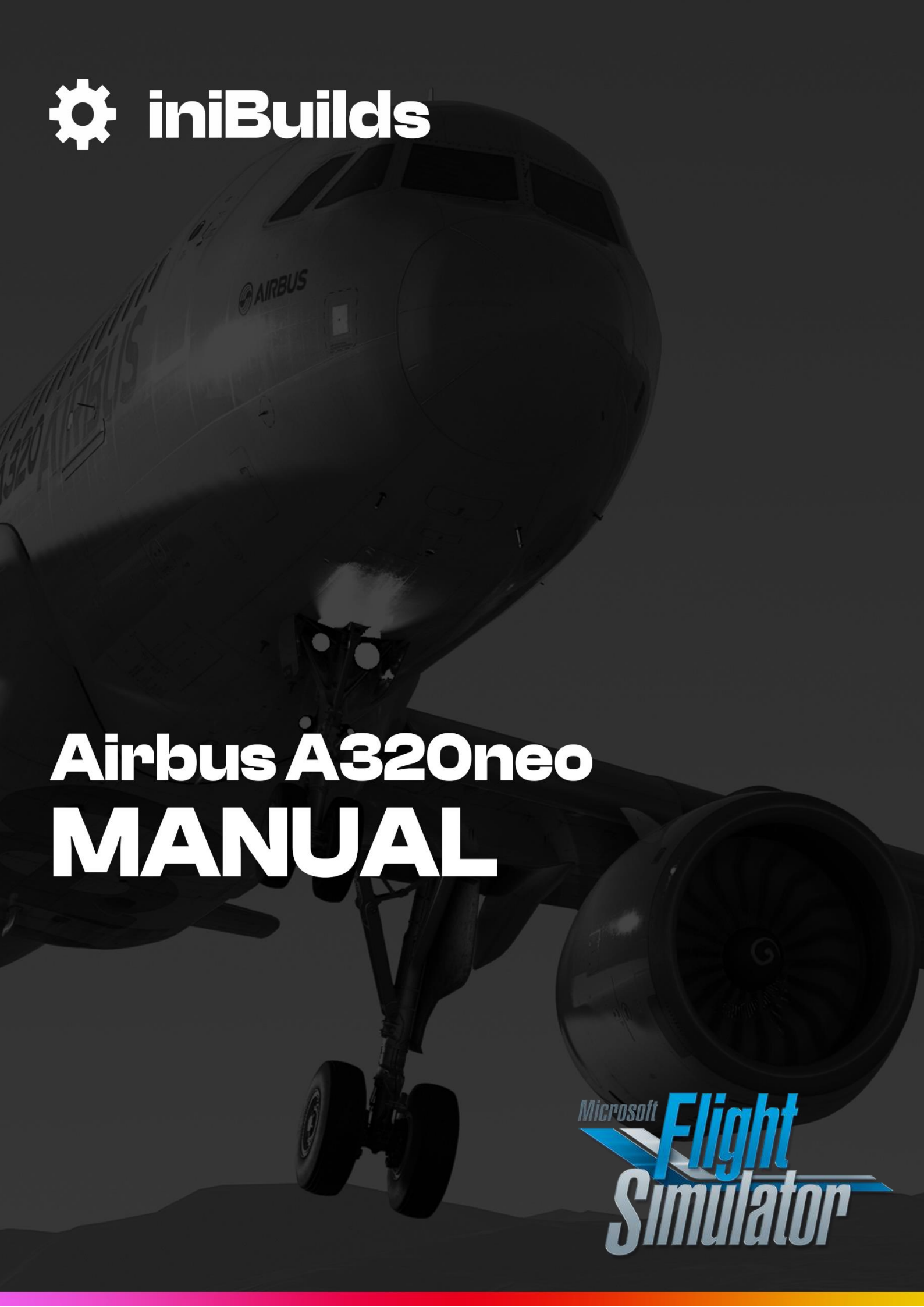
iniBuilds



Airbus A320neo
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 A320neo aircraft. It has been produced using multiple real-world Airbus A320neo operator manuals from various dates and sources with modifications to various procedures to make them more manageable under single-pilot operations.

PHOTOSENTIVE 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

Version 1.0.4 - December 5th, 2023

Contents

About the Airbus A320neo

The A320neo is a twin-engine, narrow-body, short-to-medium-range commercial airliner developed and manufactured by European aviation consortium Airbus. The A320neo is a high-efficiency, evolutionary iteration of the company's A320, one of the most successful commercial airliners ever created. The "neo" designation is an acronym for "new engine option," a reference to next-generation, optimized-efficiency, high-bypass turbofan engines that power the aircraft.

The A320neo is the flagship model of the A320neo single-aisle line of jets that includes the A319neo and the A321neo variants. The original A320 first took to the sky on February 22, 1987 and was introduced just over a year later on April 18, 1988. The A320neo took its maiden flight on September 25, 2014 and it entered service on January 25, 2016. Piloted by two, the A320neo can carry up to 195 passengers, although it typically accommodates up to 165 in standard seating arrangements.

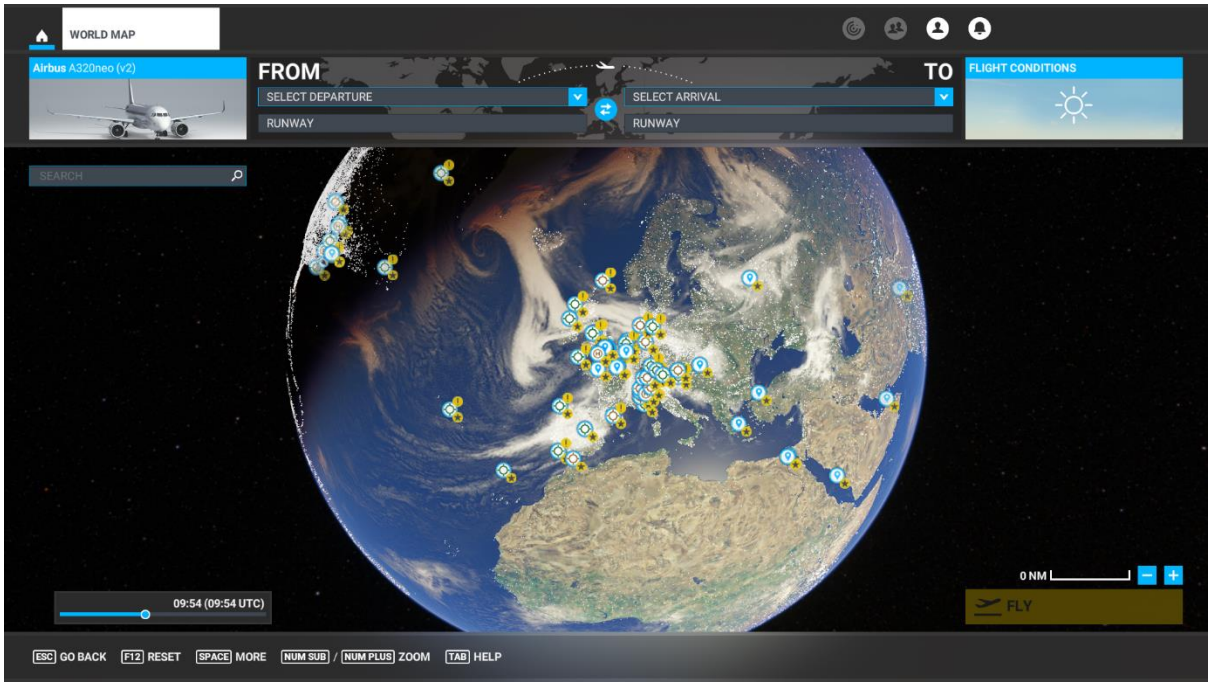
The A320neo variant of the A320 traces its roots to a 2006 Airbus initiative to enhance the efficiency of the A320 family of aircraft. This program focused on a series of aerodynamic improvements, including anti-vortex winglets. Trademarked as "Sharklets" by Airbus, these increase operational efficiency by reducing drag-inducing wingtip vortices. This efficiency optimizing outlook then included introducing updated powerplants. These new engines burn less fuel per mile and are more operationally robust from a maintenance standpoint. Overall, the combination of improved aerodynamic features and next-generation engines deliver a fuel savings of 20% over the original A320.

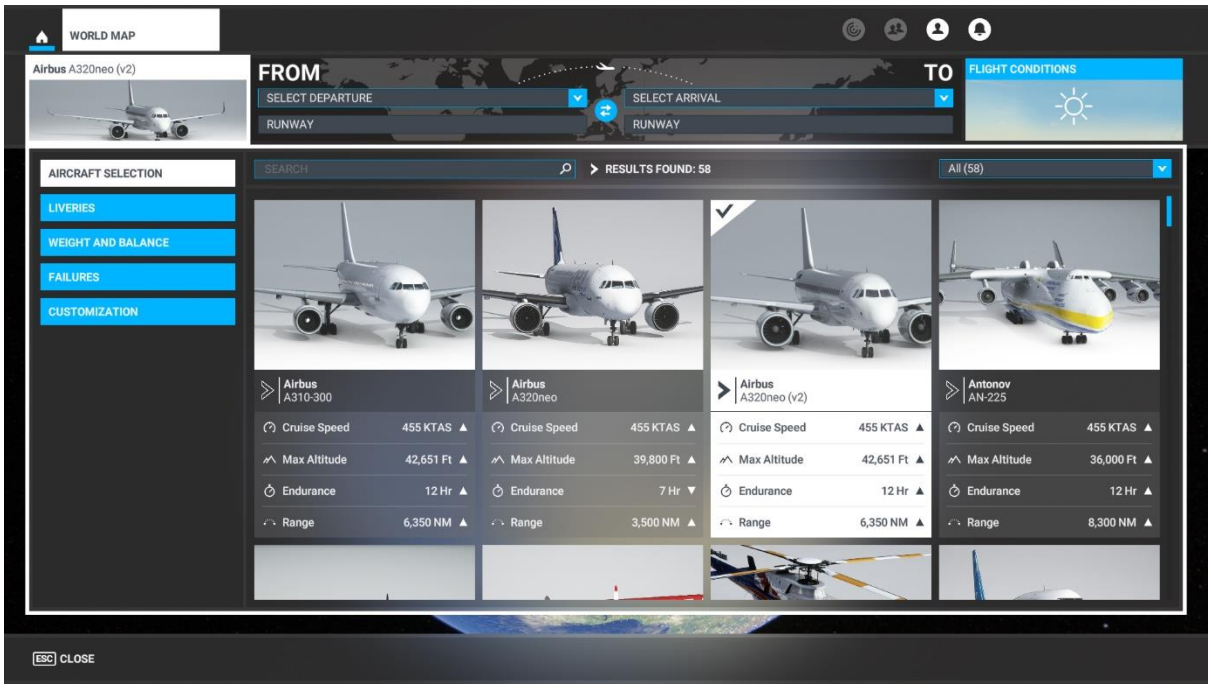
The A320neo features digital fly-by-wire control surface actuation, side-stick cockpit flight input, and state-of-the-art avionics. The aircraft measures 123 feet, 3 inches in length, stands 38 feet, 7 inches tall, and has a wingspan of 117 feet, 5 inches. It is powered by two wing-mounted CFM International LEAP (Leading Edge Aviation Propulsion) 1A26 high-bypass turbofan engines that each generate up to 27,120 pounds of thrust. The airliner has a range of 4,000 miles, a service ceiling of 39,800 feet above sea level, and a takeoff run of 6,400 feet. It cruises at 518 miles per hour and has a top speed of 544 mph.

Aircraft Selection and Liveries

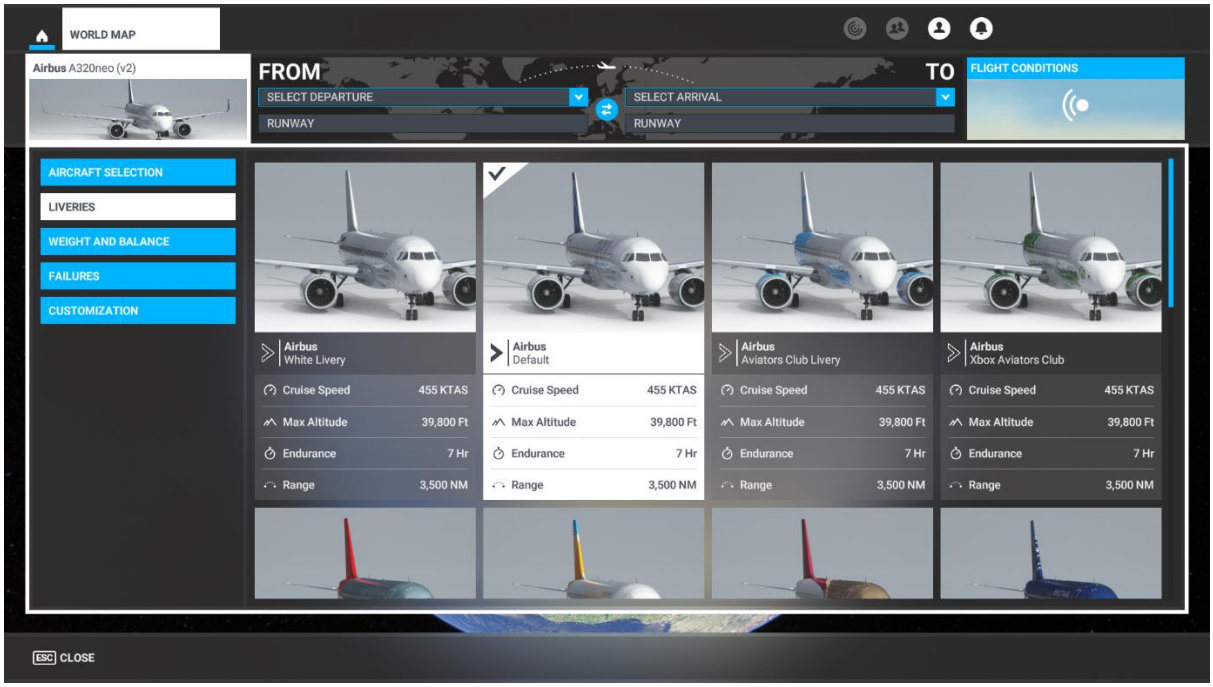
To fly the Airbus A320neo, you will need to select it from the Aircraft Selection menu.
Click on WORLD MAP in the Main Menu and click the AIRCRAFT SELECTION icon on the top left.

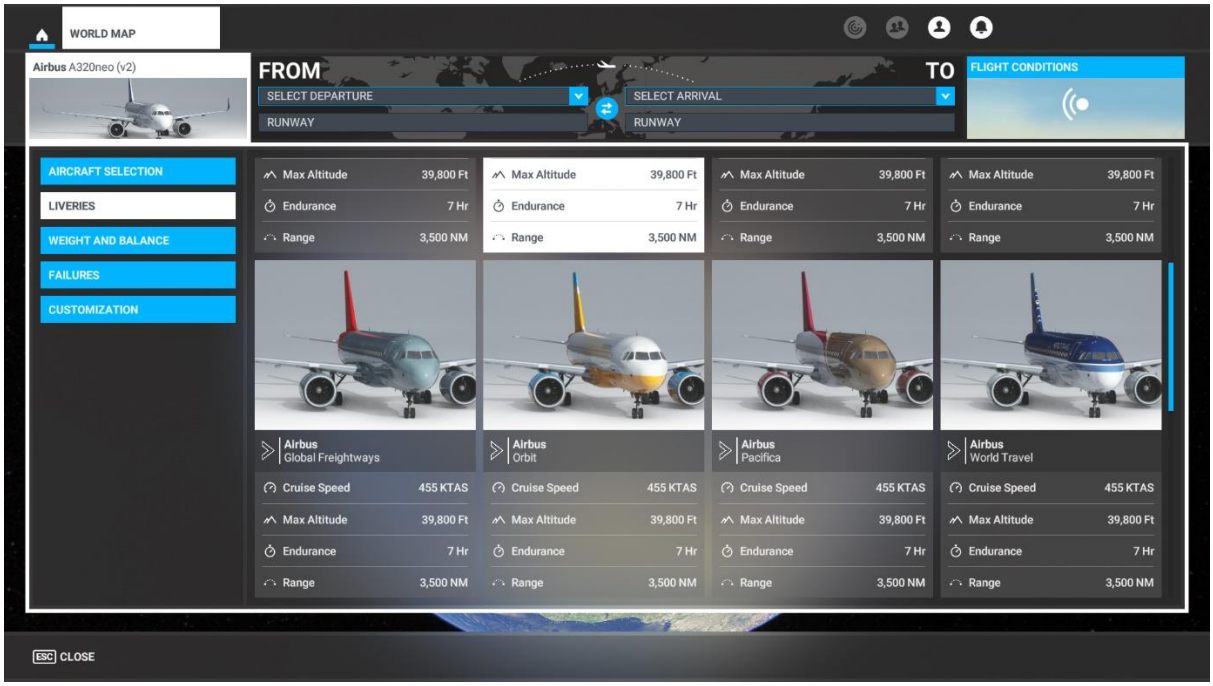
Scroll until you see the Airbus A320neo (v2) or type "Airbus A320neo" in the search bar, and select the (v2) aircraft.





Click on Liveries to select any of the various designs available for the Airbus A320neo.


WORLD MAP
Airbus A320neo (v2)
FROM
SELECT DEPARTURE
RUNWAY
TO
SELECT ARRIVAL
RUNWAY
FLIGHT CONDITIONS
AIRCRAFT SELECTION
LIVERIES
WEIGHT AND BALANCE
FAILURES
CUSTOMIZATION
Airbus White Livery
Airbus Default
Airbus Aviators Club Livery
Airbus Xbox Aviators Club
Cruise Speed 455 KTAS
Max Altitude 39,800 Ft
Endurance 7 Hr
Range 3,500 NM
ESC CLOSE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SELECT DEPARTURE
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FLIGHT CONDITIONS
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LIVERIES
WEIGHT AND BALANCE
FAILURES
CUSTOMIZATION
Airbus Global Freightways
Airbus Orbit
Airbus Pacifica
Airbus World Travel
Cruise Speed 455 KTAS
Max Altitude 39,800 Ft
Endurance 7 Hr
Range 3,500 NM
ESC CLOSE

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 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)	79 000	175 197
Maximum Landing Weight	66 300	146 068
Maximum Zero Fuel Weight (MZFW)	62 800	138 470
Operating Empty Weight (OEW / DOW)	42 500	93 697

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

Payload Limits

Limitation	KG	Lbs
Maximum Fuel Quantity	19 050	42 000
Maximum Passenger Weight (186 pax)	14 880	32 804
Maximum Cargo Hold Weight	9 435	20 800

Speeds & Performance Limits

Minimum Control Speeds

Minimum Control Speed on Ground (VMCG)	116 KTS IAS
Minimum Control Speed in Air (VMCA)	114 KTS IAS

Maximum Slats/Flaps Speeds (VFE)

Note: Max FL for slats and flaps FL200

Suitable Flight Phase	CONF	Slats	Flaps	Max Speed (IAS)
Approach	1	18	0	230 KTS
Takeoff and Approach	1+F	18	10	215 KTS
Takeoff and Approach	2	22	15	200 KTS
Takeoff, Approach and Landing	3	22	20	185 KTS
Landing	FULL	27	40	177 KTS

Gear Operating Speeds

Maximum Gear Operation Speed extension. VLO	250 KT	M 0.60
Maximum Gear Operation Speed retraction. VLO	220 KT	M 0.54
Maximum Gear Locked Down Speed VLE	280 KT	M 0.67

Miscellaneous Speeds

Maximum Tire Ground Speed	195 KTS (225 MPH)
Maximum Windshield Wiper Operation Speed	230 KTS
Maximum Open Cockpit Window Speed	200 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	9 200 ft AMSL

Wind Speed Limitations

Maximum Tailwind Component (Takeoff and Landing)	15 KTS
Maximum Demonstrated Crosswind (Dry Runway)	38 KTS
Computed Crosswind Capability Takeoff (Dry and Wet Runways)	35 KTS
Maximum Wind for Passenger and Cargo Door Operation	60 KTS

Autoland Limitations

Maximum Headwind Component	30 KTS
Maximum Crosswind Component With Rollout	15 KTS
Maximum Tailwind Component	10 KTS
Maximum Altitude	5750 FT
Glide Slope	-2.5 to -3.25 degrees

Aircraft Configuration Summary

For awareness and for the specified aircraft modelled, 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.

Item	System	Installed
2 ADFs	**NAV**	**Yes**
ADS-B OUT	**SURV**	**Yes**
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**
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**
Cockpit Door Deadbolt	**EQUIPMENT**	**Yes**
Cockpit Foot Warmer	EQUIPMENT	No
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	No
Continuous Descent Profile Optimization (CDA)	AUTO FLT	No
Delta ISA	**EIS**	**Yes**
Door Aural Warning Horn	DOOR	No
DOOR SW OVRD	DOOR	No
Dual Ice Detection System	**ICE**	**Yes**
EGPWS	SURV	No
ELT switch	**COM**	**Yes**
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**
Man-made Obstacle Function	SURV	No
MMR	**NAV**	**Yes**

NAV Mode Automatically Engaged (Armed) at Go-Around	**AUTO FLT**	**Yes**
Optional Applications: DCL, OCL, D-ATIS	FANS	No
PWS	**SURV**	**Yes**
QFE BARO Setting	NAV	No
RAAS	SURV	No
Rain Repellent System	**RAIN**	**Yes**
Rising Runway Symbol	EIS	No
RMP Load Function	COM	No
ROW/ROPS	SURV	No
RNP AR	AUTO FLT	No
ROW/ROPS	SURV	No
SATCOM	COM	No
Soft Go-Around Function	ENG	No
T2CAS	**SURV**	**Yes**
Tail Strike Pitch Limit Indicator	EIS	No
TPIS	WHEEL	No

Airbus A320neo Specifications

Cruise Speed: 455 KTAS
Max Altitude: 39,800 FT
Max Weight: 175,197Lbs
Range: 3,500 NM
Fuel Capacity: 6,268 Gal
Length: 123.20 Ft
Wingspan: 117.50 Ft

Important Notes About the Airbus A320

The aircraft is normally operated by two pilots, however, the following procedures have been written for single simulator pilot operation.

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 task sharing.
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 important systems to understand on any Airbus family aircraft as it is the mechanism that the aircraft uses to communicate to the flight crew exactly what actions it is undertaking at any given moment and what actions it will undertake in the immediate 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.

When a condition changes, the FMA will indicate the change with a box. Sometimes the box will flash, or you will hear a triple click and a flashing box. This is when a mode has reverted without the pilot making an input and the aircraft wants to draw your attention to it. Below is an example of the box shown 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
This indicates the aircraft's thrust setting.
Red = Vertical mode
This indicates the vertical mode the Flight Director and Autopilot are following.
Grey = Lateral mode
This indicates the lateral mode the Flight Director and Autopilot are following.
Purple = Approach capability

This indicates the Autopilots current maximum approach capability. CAT 3 DUAL for example, is the equivalent of a CATIII (zero visibility) approach.

Pink = Autopilot, flight director and A/THR state

This indicates the status of the currently engaged Autopilot and Flight Directors, as well as Autothrust engagement condition.

Lights out concept

What is the lights-out concept?

When configuring the aircraft prior to flight operations, **all white lights should be selected off.** The normal in-flight configuration has no lights shown at all.

Other colors of lights used in the cockpit.

Blue = Temporary selection

Some examples include auto brakes, APU, and External power. These are not normally selected for the entire flight, so are "Temporarily" selected.

Amber = Caution

Red = Warning

To alert the pilot to abnormal and emergency conditions, the relevant system 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

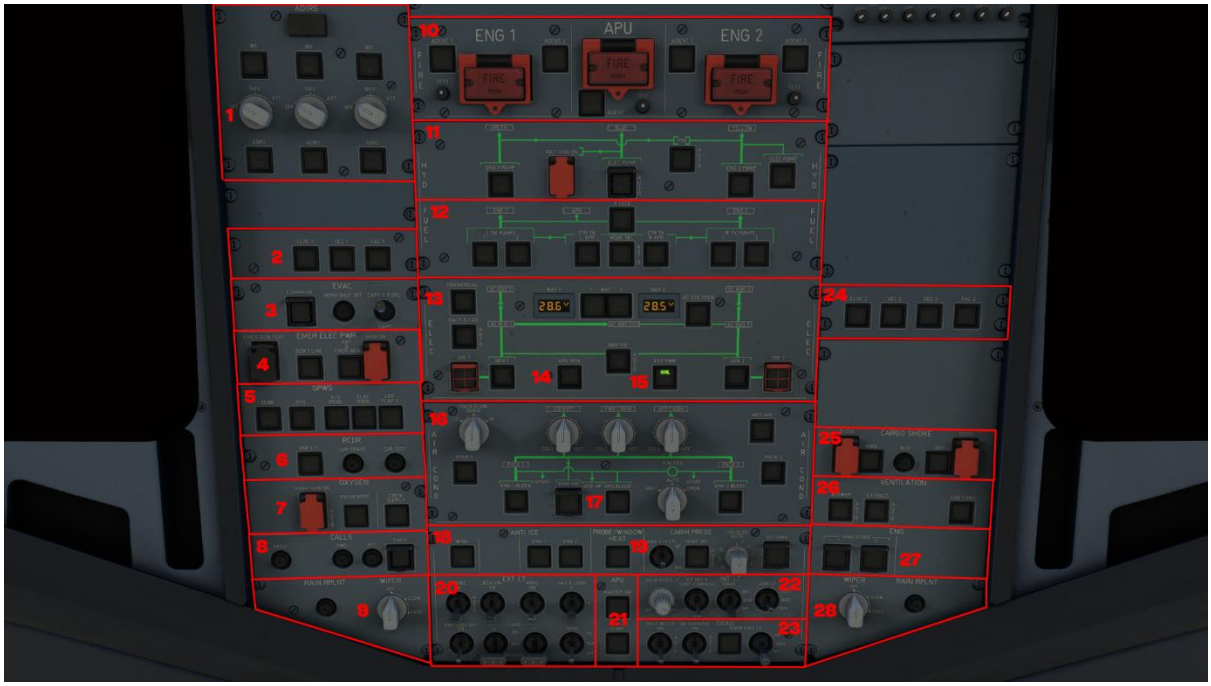
Modern Airbus aircraft are fitted with a sophisticated Fly-By-Wire (FBW) system.

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. CPT Master Warning / Caution 2. CPT EFIS 3. Flight Control Unit (FCU) 4. FO EFIS 5. FO Master Warning / Caution 6. CPT Lighting Panel 7. CPT Primary Flight Display (PFD) / Navigation Display (ND) 8. Integrated Standby Instrument System (ISIS) 9. Engine and Warning Display 10. Gear Indicator / Brake Select Mode	11. Clock 12. Landing Gear Lever 13. Brake Pressure Gauge 14. FO Primary Flight Display (PFD) / Navigation Display (ND) 15. FO Lighting Panel 16. CPT Tray Table 17. FO Tray Table 18. CPT Footrest 19. FO Footrest 20. System Display Page

1. CPT MCDU	11. Pedestal Flood Lighting
2. ECAM Switching Panel	12. Weather Radar Panel
3. FO FMCDU	13. Engine Start Panel
4. ECAM Control Panel	14. Transponder
5. CPT Radio Panel	15. Speed Brake / Spoilers
6. Thrust Levers / Trim Wheels	16. Rudder Trim
7. FO Radio Panel	17. Flaps Lever
8. CPT Radio Volume Panel	18. Cockpit Door Lock
9. FO Radio Volume Panel	19. Parking Brake
10. Main Flood and Integral Lighting	20. Gravity Gear Release



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

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

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 username must be set within the Settings Page for this feature to work.

Ground Page – Controls doors on the aircraft along with requesting external Ground Services Equipment, Jetway, Pushback and manual steering of the aircraft during pushback.

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

When clicking in any manual entry box, a pop-up keyboard will show, which overrides any default key bindings you have set.
To close the keyboard, click the down arrow in the bottom right-hand corner.

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.

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 A320neo 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 and Guidance System (FMGS)

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

- Two Flight Management Guidance Computers (FMGC)
- Two Multipurpose Control and Display Units (MCDU) (third MCDU is optional in some aircraft but not modelled in this simulation)
- One Flight Control Unit (FCU)
- Two Flight Augmentation Computers (FAC).

The Flight Management and Guidance System (FMGS) 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 FMGS 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 FMGS 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 and Guidance Computer (FMGC)

Each FMGC is divided into two 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.

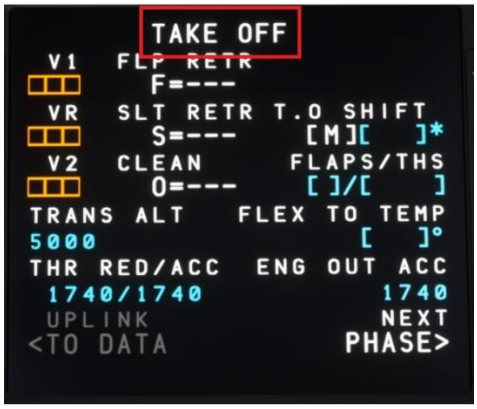
Multipurpose Control and Display Unit (MCDU)

Two MCDUs are installed on the pedestal for flight crew loading and data display. The MCDU allows the flight crew to interface with the FMGC 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.).

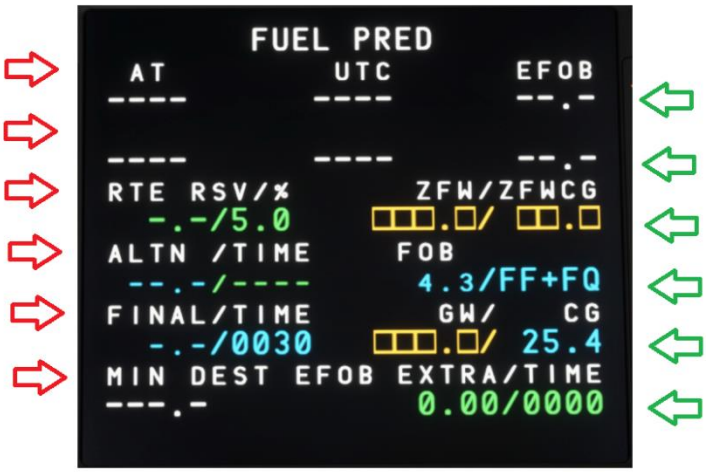
Data that is entered into the MCDU that is illogical or beyond the aircraft's capabilities will either be disregarded or will generate an advisory message.

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

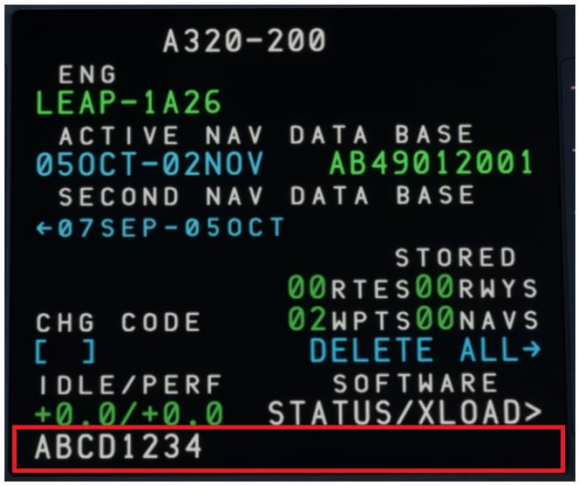
- A title line that gives the name of the current page in block letters.



- 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 PAGE key
  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

Calls 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 so 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.

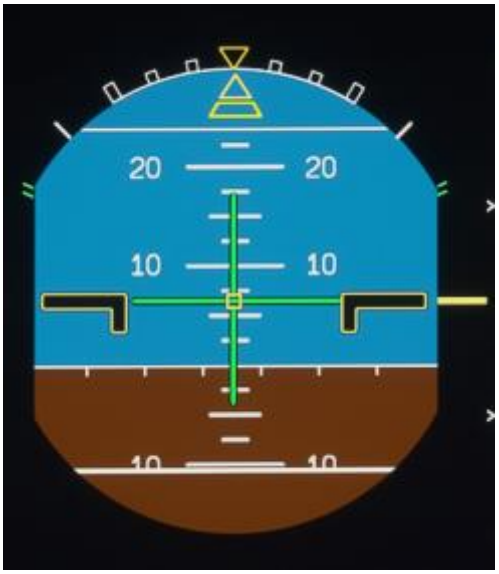
2) SPD/MACH knob:
   When pulled, this knob controls speed in IAS or MACH depending on altitude or if SPD MACH button pressed (upper left).
   When pushed, speed is 'managed' from the FMS.

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).

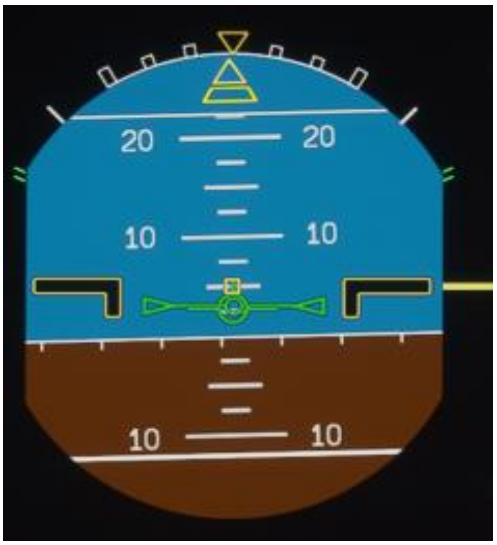
Pushing the knob arms managed NAV or within a set margin to the NAV track will automatically switch to NAV.

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 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.

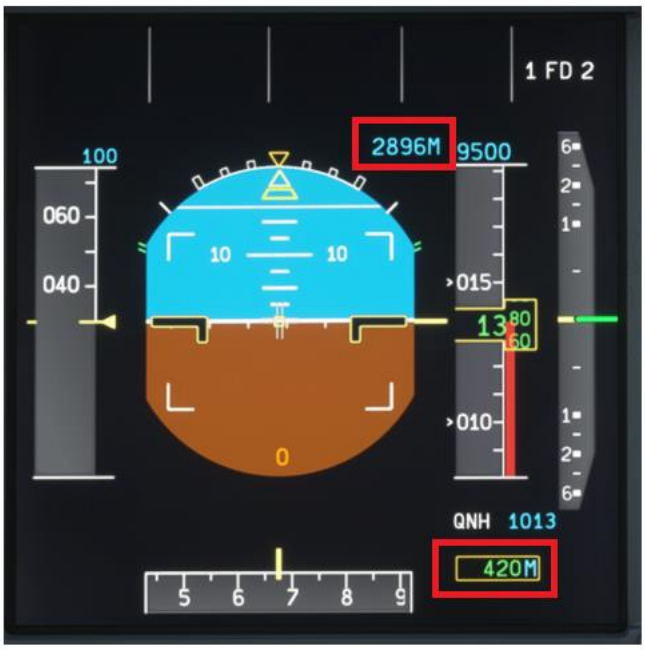
7) A/THR (Autothrust) push button:
The flight crew uses this push button to arm, activate or disconnect the autothrust.
Disengaging the A/THR is usually done with the instinctive A/THR disconnect buttons on the thrust levers.

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) EXPED (Expedite) push button:
This pushbutton is used to engage the expedite mode.
Engaging this mode will increase the vertical speed by selecting Green Dot in a climb or M0.80/340kts in a descent.

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 to what 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 Computer (FMGC), 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.
- Configuring the autothrust to its active mode when the levers are positioned between IDLE and the CL detent or MCT.

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)

If using the in-sim ATC menu functions to change frequency, the radio will automatically change, 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 pushbutton 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.

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.

Weather Radar (WXR)

The Airbus A320neo features a weather radar which is shown on the Navigation Display (ND) screen.

1) CAPT Weather Display Selector
   This must be in a setting other than 'Off' to display weather on the Navigation Display (ND).

2) Weather Radar and Predictive Windshear Switch
   When selected 1 or 2 weather will be displayed on the ND.

3) FO Weather Display Selector
   This must be in a setting other than 'Off' to display weather on the Navigation Display (ND).

Operations and Techniques

This section outlines the procedures and techniques required to operate the A320neo 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 Manchester, UK (EGCC) to Palma De Mallorca, Spain (LEPA). 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 EGCC 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.

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 and Guidance Systems (FMGS) are 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 L2 or L3.

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

To enable synchronization with Simbrief, the MCDU will also need to be connected to this service. You can do this by pressing the MCDU MENU (1) page, then selecting key L2 for ATSU (2).

Type your Simbrief username into the scratchpad and enter it into the username field by pressing select key R1.

To initialize the flight, press the INIT page (1) key to bring up the INIT A page on the MCDU. If the Simbrief username is entered correctly, you should see an INIT REQUEST* message next to line select key R2. Press this to pull 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 EGCC/LEPA into the scratchpad and press line select key R1. Confirmation of the saved route (if available) will be displayed.

You will need to manually enter the Flight Number (1) and Cost Index (2) using the scratchpad to type the data and then the line select key to enter it.

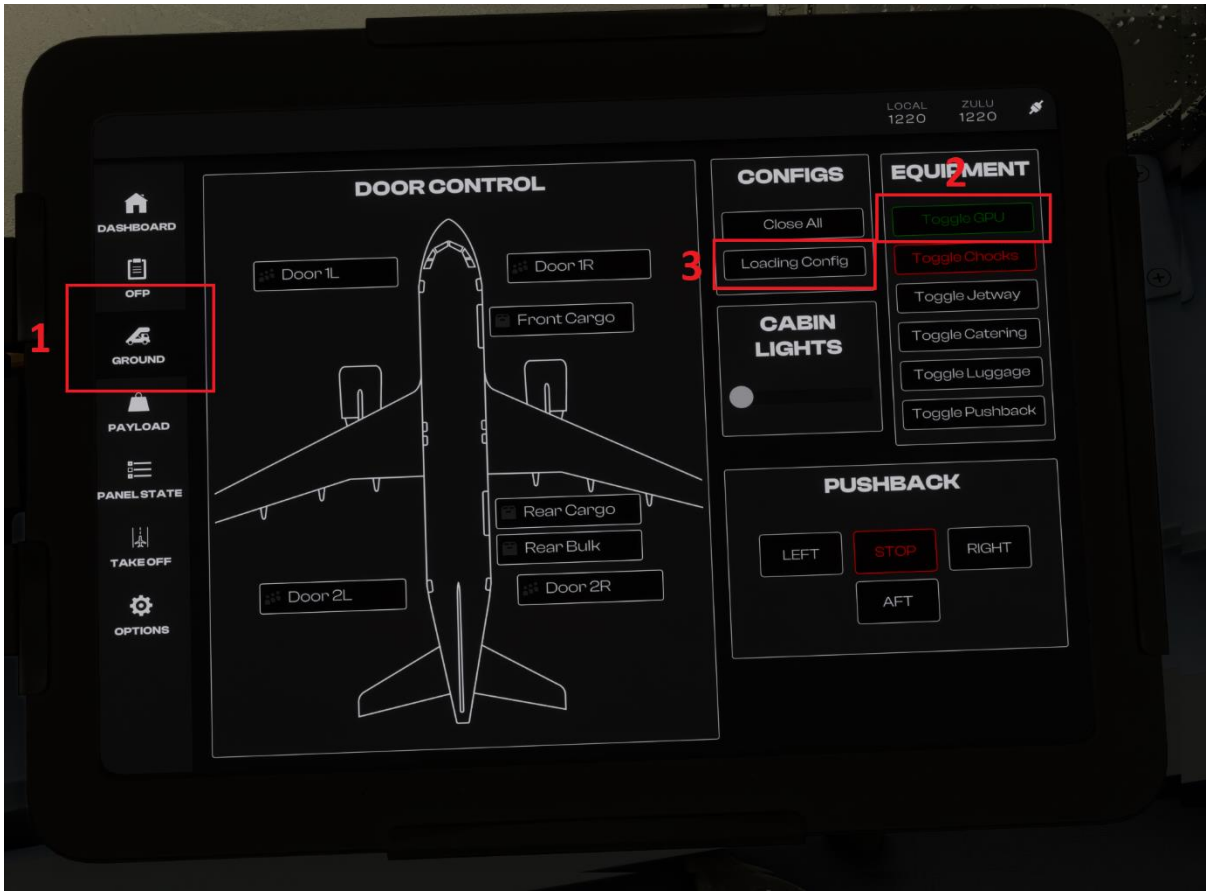
The MCDU has now been initialized.

Ensure your Simbrief username (2) is entered in the EFB Options tab (1).
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 (3).

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

You will notice when the import has been successful as the Flight Number, Departure, Destination and Alternate Airfield data will be populated. 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 and pressing the Loading Config button (3). As You should now be running the aircraft on APU, you can disconnect the GPU by pressing the Toggle GPU button (2).



To load passengers and cargo you will select the Ground page (1) from the EFB shortcuts. You can manually select the Zero Fuel Weight (ZFW) and Fuel load manually using the sliders. If the EFB option to use ZFW is set to 'No' then the pilot can select number of passengers and cargo weight manually instead. Once the desired values have been entered, pressing the Apply Load (3) button will start to add the payload.

You are given the option to set the loading speed of the aircraft at this point using 3 options.

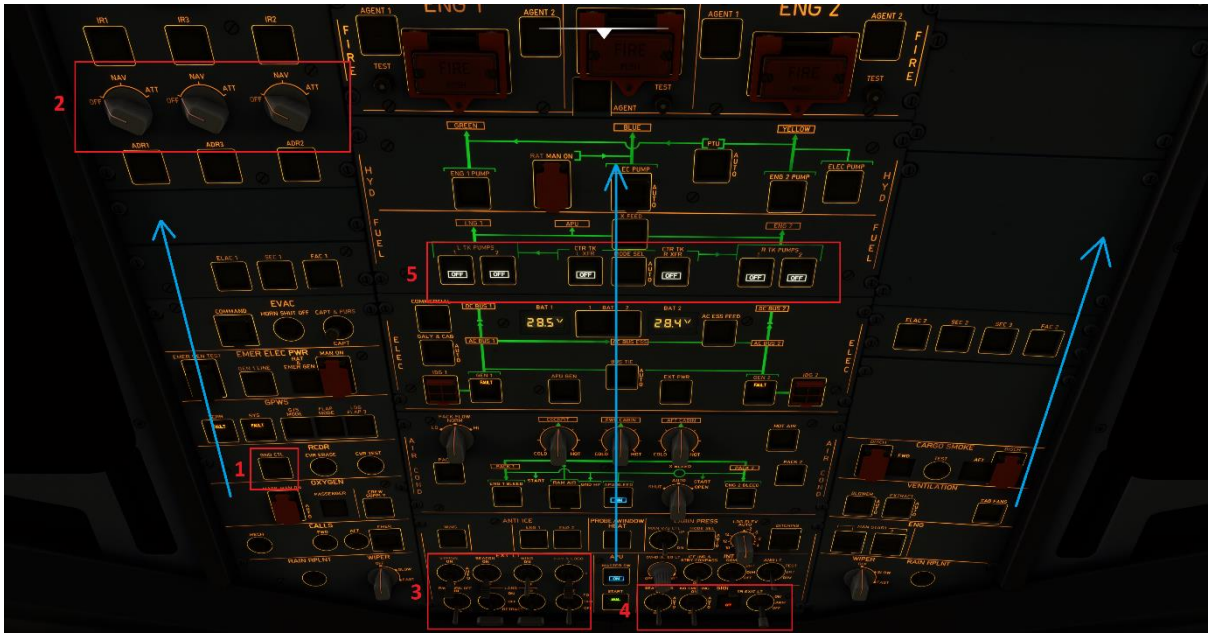
The aircraft should now have power applied and running on its own with a load in progress or complete.

Cockpit Preparation

The pilot's next responsibility is configuring the aircraft Flight Management and Guidance Systems (FMGS). This can be broken down into navigation, weight, and performance envelopes. To set up the aircraft correctly, you will use a number of cockpit 'flows' and scans. You can also use the in-sim checklist for guidance.

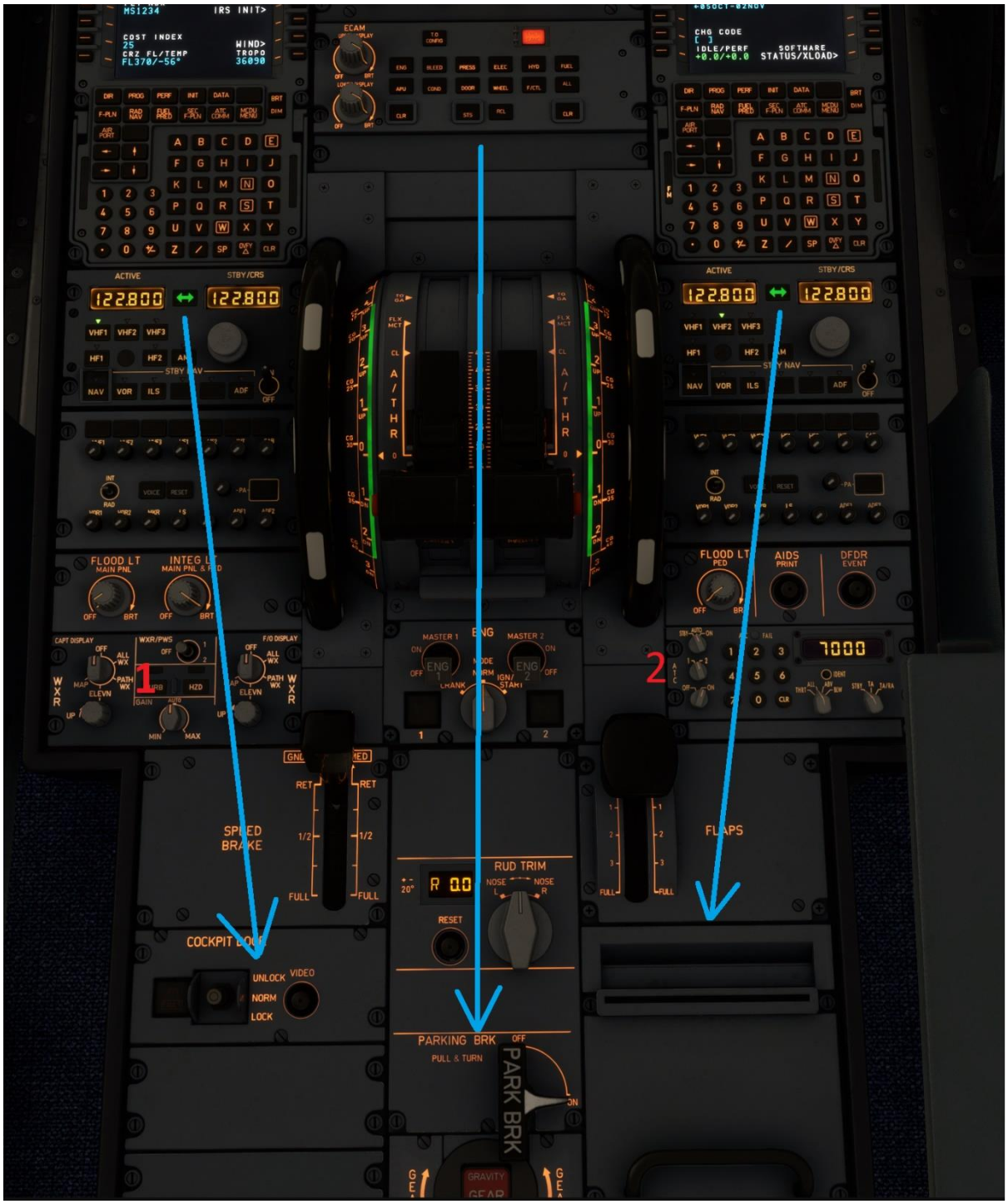
The scans normally start on the overhead panel using a flow of bottom-to-top, left-to-right. Pay particular attention to the following items to ensure the aircraft is set up correctly for departure.

1) The GND CTL push button should be selected 'On'.
2) ADIRS selectors 1, 2 and 3 need to be in NAV.
3) 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 – Both RETRACT
    g. NOSE switch – OFF
4) 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
5) Fuel pump push button switches all On. Any white light (Off) switch should be turned On during this flow.



The next flow is around the Center Instrument Panel, checking the ISIS (1) is on and aligned, Landing Gear Lever (2) is DOWN, the GPS clock (3) is set, and the A/SKID & N/W STRG (4) is On.

The Center Pedestal is the next flow focus. Here we will check that the WXR (1) is configured for departure (but not yet turned On), and the ATC transponder (2) is set with your squawk code if received from ATC.



Now you can also finish setting up the FMGS 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 left line select keys (1) to select and enter the required runway and the up and down slew keys (2) as required for additional runway options where applicable.
Repeat the process to enter the desired SID.

You can see above we have entered runway 23R and the SANBA1R departure at EGCC (Manchester). 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.

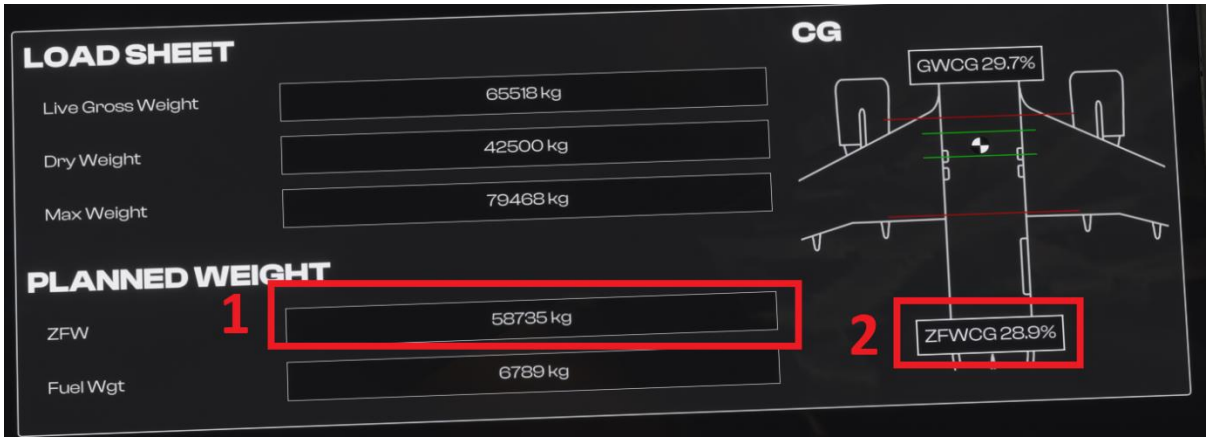
You can get a better view of the planned route on the ND by turning the EFIS control knob to PLAN and increasing the range. You should also select the CSTR (constraints) option to confirm the flight plan altitudes are entered correctly according to the appropriate chart.

Note – the FMGS 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.

The Zero Fuel Weight (1) and ZFWCG (2) to enter can be taken from the EFB Payload page.

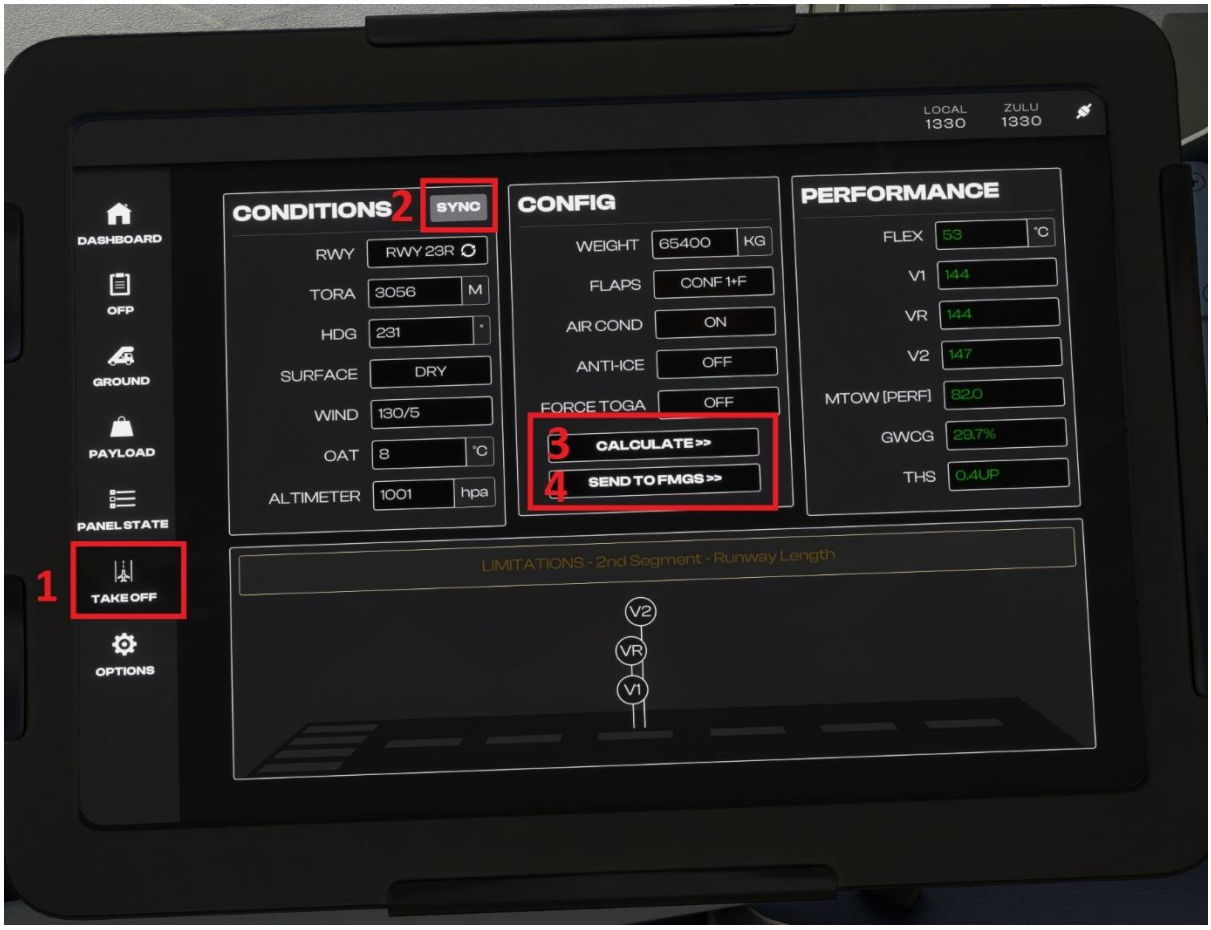


The block fuel can also be taken from this page but is usually taken from the upper ECAM Fuel On Board (FOB) display.

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 'armed' (1). To confirm the takeoff data (2), press line select key R6. This should also populate the Flex to Temp (3).

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

The only item that is not entered, but required for aircraft configuration is the Flap and Trimmable Horizontal Stabilizer (THS) setting (1).

This should be entered in the MCDU scratchpad using the format 1/0.4UP and entered into the performance page using line select key R3.

This concludes the minimum MCDU configuration requirements. The final element of the FMGS and cockpit pre-flight preparation is to set up the autopilot (FCU).

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.

The Speed (SPD) and Lateral Navigation (LAT) should both be automatically in Managed Mode (3). 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 (4).

You can set your first assigned altitude using the altitude selector knob (5). This is normally indicated on the SID chart or given by ATC. For your purposes, you will set this to your final 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).

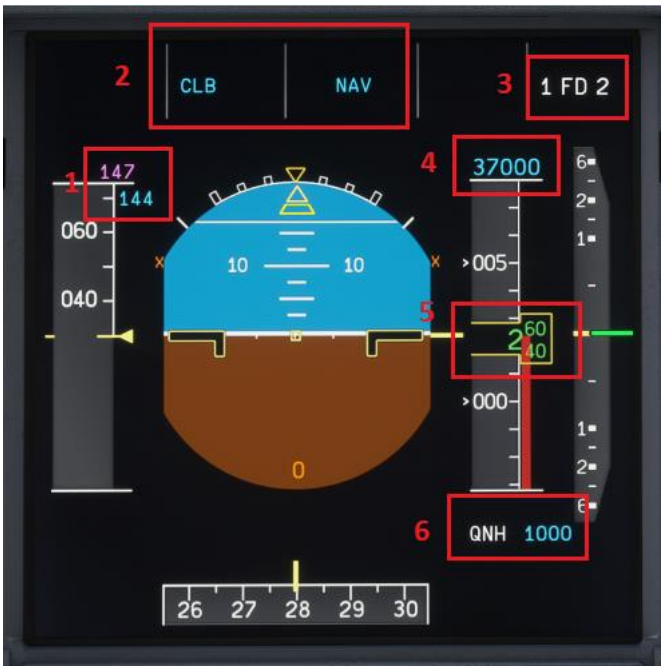
The Decision (V1) and Initial Climb Speed (V2) are displayed on the speed tape (1).

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 aircrafts current altitude (5) is correct according to relevant data on the currently selected pressure setting (6).



Before Engine Start

Before commencing the next phase, the first item you should check is to ensure the loading is fully complete and that 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.

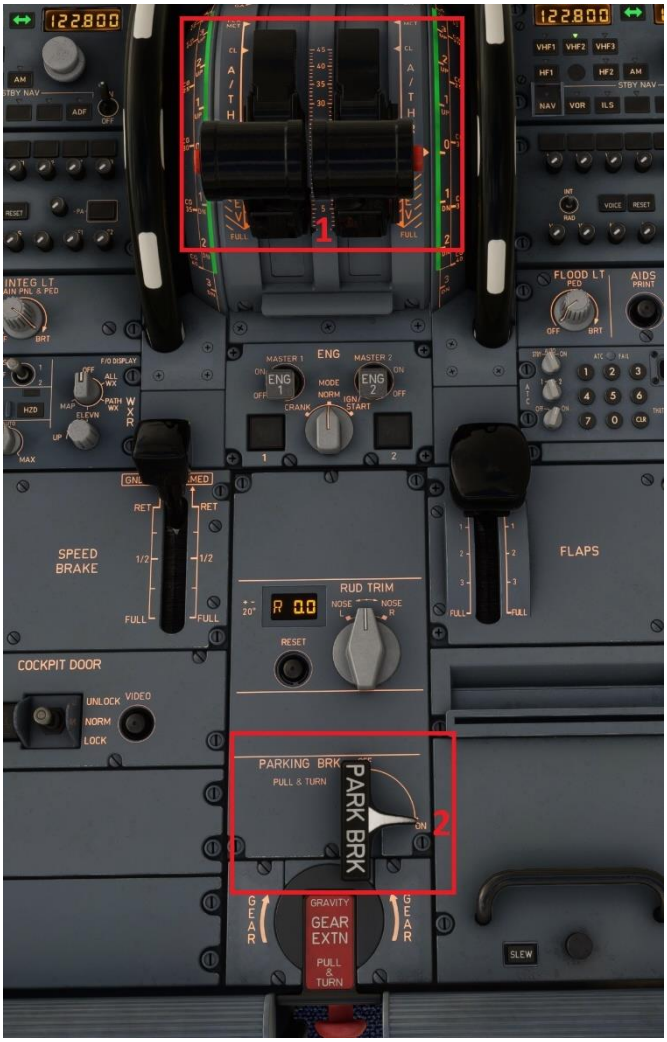
You can confirm the status of the doors from the cockpit by viewing the lower ECAM display. This should normally be on the DOOR/OXY page after initialization but can be selected by pressing the ECAM control DOOR button.

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

You should ensure the BEACON light switch is set to ON.

The thrust levers are fully idle (1).

And the parking brake is set to ON (2).



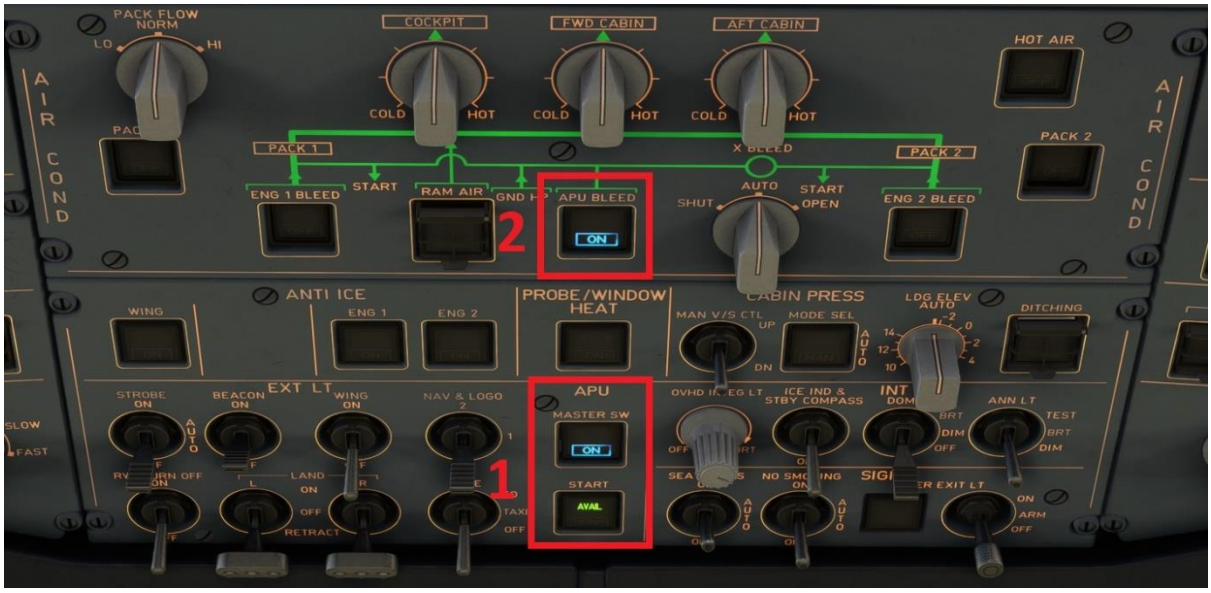
Pushback and Engine Start

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

To start a pushback, first press the button to toggle the pushback tug (1). Then use the Left, Right and Aft buttons (2) to guide the pushback direction.
Release the parking brake to commence the procedure.

Once you reach the desired point on the taxiway, the pushback can be stopped by pressing the STOP button. The pushback tug will automatically disconnect.

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 A320neo will normally start engine 2 first, this is so hydraulic power from the engine can then be used to control the brakes during pushback.
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).
Starting engine 1 is done by performing the identical procedure.

After Engine Start

After the start sequence has completed on both engines and the pushback tug has disconnected, you will conduct another 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) Set the trim wheel (4) to the setting in the MCDU Takeoff PERF page and EFB calculation by dragging it up or down.

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

Taxi Out

Normally the next set of flows is done during the taxi but for simplicity you will conduct these before attempting to move. As you become more competent with handling the aircraft you will be able to do these while the aircraft is moving.

First, set the Nose Light to TAXI; this will indicate to aircraft and vehicles around you that the aircraft is about to move under its own power.

Turn the WXR/PWS On by selecting System 1 and ensure that the CAPT and the FO Display knob is set to ALL WX.

Next, set the Auto Brake to MAX (1).

Check the T.O. Memo has no blue. Cabin Ready (2) may still be waiting 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 (3) push button on the ECAM control panel to complete the test.

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 20 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 20 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.

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

Before Takeoff

Once takeoff clearance is received, there is once again a flow to follow to ensure the aircraft is fully 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. WING switch – ON
    c. RWY TURN OFF switch – ON
    d. LAND switches – Both ON
    e. NOSE switch – TO

2) ATC Transponder and Traffic Collision Avoidance System (TCAS)
    a. ATC Mode – AUTO/ON
    b. TARA 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 A320neo thrust management is conducted by the FADEC and FMGS. 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. So, 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 center line 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, the vertical guidance is in Speed Reference System (SRS) Mode and the lateral navigation is in Runway (RWY) track mode. Finally the auto thrust (A/THR) has 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 to 6 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 on the SD page and the position indicator just above the lever.

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).

Now the aircraft is accelerating you will notice an S or F (depending on takeoff flap set) approaching from the top of the speed tape on the PFD. This will shortly be followed by a red and black 'barbers pole' indicating a maximum flight envelope speed, in this case our maximum Flap speed in this configuration. The active speed mode is now Thrust Climb (THR CLB).

When reaching 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. RWYTURN 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 such as the SANBA departure from Manchester. The autopilot will temporarily stop the aircraft from climbing due to this restriction. This will be evident from a magenta altitude constraint on the PFD altitude tape and the FMA indicating Altitude Constraint (ALT CST) mode.

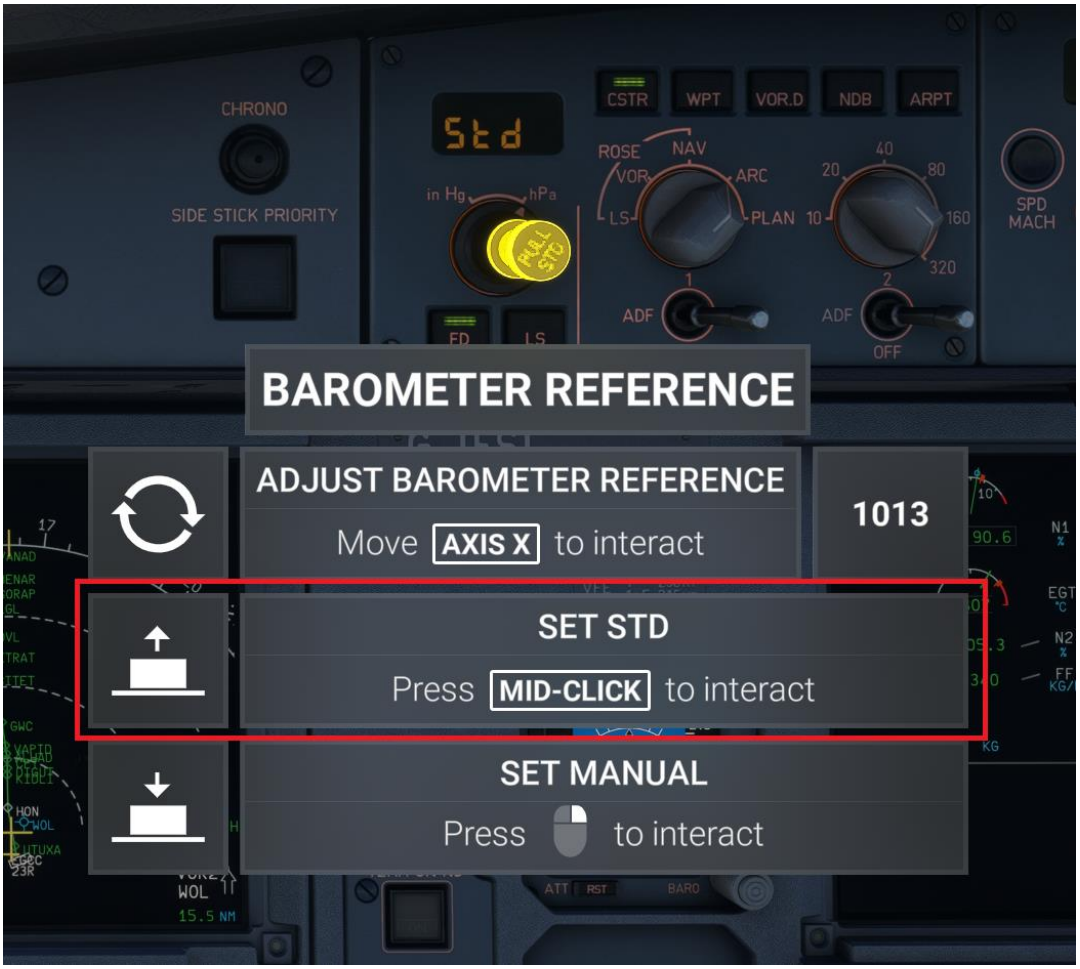

SPEED
ALT CST
CLB
NAV
AP1
1 FD 2
A/THR
280
260
240
220
20
20
10
10
10
10
055
045
5000
QNH 992
14
15
16
17

You can however override this and continue a constant climb to your selected cruise altitude. To do this you would pull 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 should now continue to 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 pressing the baro selector knob.



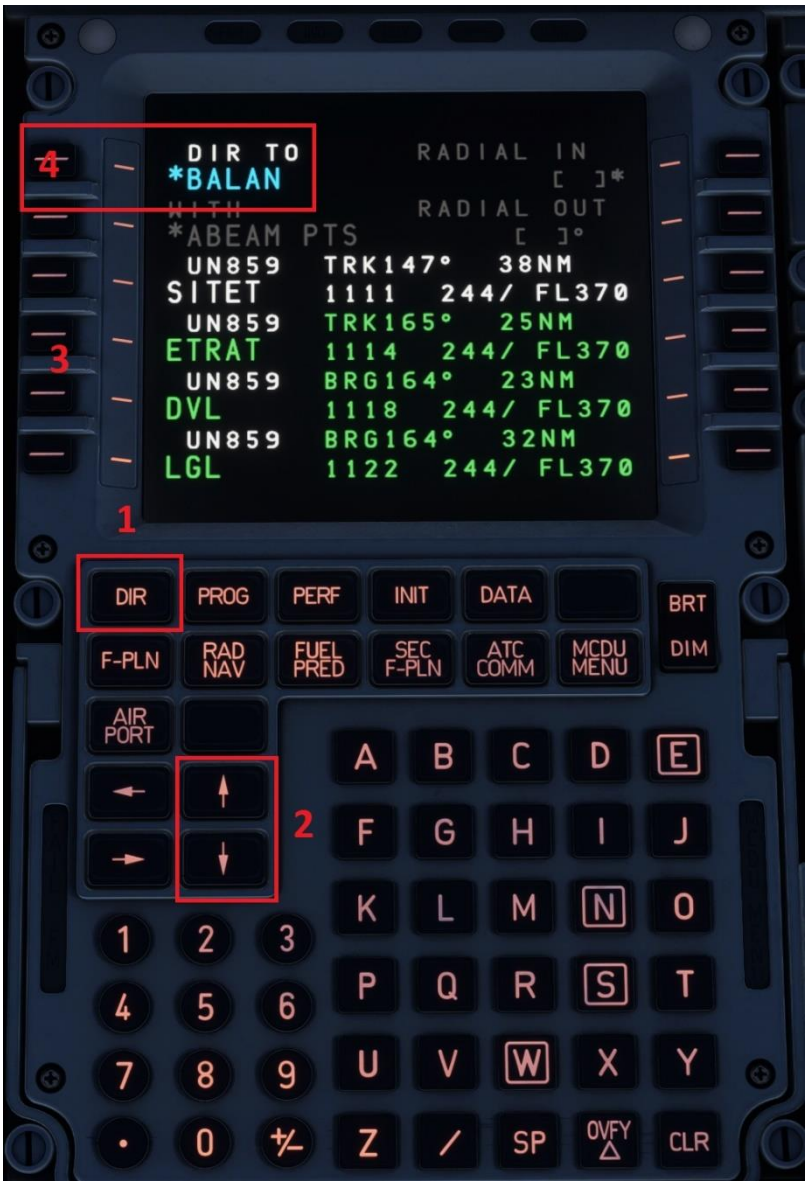
Landing lights should be retracted above 10,000 ft and the passenger seat belt sign can also be set to Auto.

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 FMGS 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 BALAN.
3) Press the line select key (3) next to BALAN to enter it in to the DIR TO.
4) Activate the DIR TO by pressing line select key L1 (4).



The aircraft will turn towards BALAN 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 FMGS for the arrival procedure into Palma. 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 Standard Arrival Route (STAR) 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 LEPA.

Press line select key R1 to select the arrivals page.

And then press line select key L5 to select the ILSY for Runway 24L.

Scroll down using the slew keys until you find the LORE1P arrival, press the relevant line select key, in this case it is L4. Press INSERT* at line select key R6.

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 300NM 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 FMGS 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.

The final element to complete on the PERF page is the decision altitude. As you are planning to do an Autoland, you will type NO in the RADIO.

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 retardation devices including spoilers, thrust reversers, and wheel brakes to decelerate. Palma is a large international airport with long runways so you can safely use a low autobrake setting. Press the Auto Break Lo button.

You should be approaching your 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 to aim for.
2) Descent profile.

Normally, ATC dictates descents as series of 'step downs', but for the purpose of this guide, you will set your final approach fix altitude. For the ILS24L, this is 2,500 ft.

Set the FCU altitude to 2,500 ft. Note that the outer switch controls the decrement, either 100 or 1000 feet.

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

The FMA should now read like the following:

This route has some altitude constraints similar to your departure. 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 remain at the level.

When descending through 10,000 ft you can set the landing light switches to ON and the seat belt signs to ON. The autopilot should automatically reduce speed to 250 kts. You will also select the Landing System (LS) pushbuttons to ON to give you and the autopilot guidance.

If you find the aircraft is remaining 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.

Approach

You would normally be cleared for the approach by ATC, but you can set the FCU by pressing the second AP button to ON and arming the approach by pressing the APPR button.

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 multiple pieces of information. The primary elements on which to focus during the approach are the lateral and vertical modes having armed and captured the ILS. This is indicated by the G/S* and LOC*.
You will 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 at the bottom left of the PFD.
The localizer and glide slope deviation bars indicate our vertical and lateral track compared to the ILS signal from the ground.

Before intercepting the final approach, you need to begin slowing the aircraft to its final approach speed. There are two speeds to consider as you slow through the approach phases. The VFE Next indicated by orange stripes and the Next scheduled F or S speed. The aircraft's speed must be below VFE next to avoid an overspeed and close to the S or F speed to select the next stage of flap settings.

After Flaps 2 you will select the gear down, this will also help the aircraft decelerate whilst descending along the glide path.

Once below 2000 ft and in landing configuration, the landing memo will be displayed to confirm that the aircraft is ready for landing.
Ensure that the spoilers are armed by pulling the spoiler control.

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 deploy 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 throttle 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). You will also need to press the brakes to manually take control of braking again.

Congratulations, you have completed the flight! You can now taxi to an available parking stand and follow the in-sim checklist to shut down and secure the aircraft or the simplified procedures checklist that follows.

Simplified Procedures

Preliminary Cockpit Preparation	
Engine Master 1&2	OFF
Engine Start Selector	NORM
WEATHER RADAR (SET)	
Weather Radar	SET
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	CHECK VOLTAGE
External Power	ON
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
AIR CONDITIONING PANEL (SET)	

APU Bleed	ON
All White Lights	OFF
X-BLEED	AUTO
Cockpit and Cabin Temperatures	AS REQD
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
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 Pressure	CHECK
Brake Pedals	RELEASE
Park Brake Handle	ON
Emergency Equipment	CHECK
Landing Gear Pins and Covers	CHECK

Flight Deck 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	LT 1
RWY Turn Off	OFF
Landing L&R	OFF
Nose	OFF
Seat Belts	ON
No Smoking	AUTO

Emer Exit Light	ARM
Probe/Window Heat	AUTO
Pack Flow	AS REQD
BATTERY CHARGE CYCLE	
ELEC SD Page	PRESS
Battery 1&2	OFF THEN ON
ELEC SD Page	CHECK
Engine 1&2 Fire	CHECK
Agent 1&2 Lights	OFF
ENG Test	PRESS AND HOLD
Maintenance Panel	CHECK
Vent Panel	CHECK
Reset Buttons (Right-Hand Side)	CHECK
ISIS CHECK	
Brightness	ADJUST
IAS, ALT Readings	CHECK
ATTITIDUE	CHECK
Clock	SET
LDG Gear Gravity Extn Selector	OFF
A/Skid & N/W Steering Switch	ON
CPT & FO AUDIO CONTROL PANEL (ACP) SET	
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
XPDR Selector	SYS 1
NAV Charts	PREPARE
FMGS PREPERATION	
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
ADIRS POSITION INITIALIZATION (IF NEEDED)	
IRS INIT	CHECK
Align IRS	PRESS
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
EFB/MCDU Green Dot	COMPARE

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
PFD/ND Brightness	CHECK
ND	CHECK
PFD	CHECK
SD PAGE PUSH BUTTON (PRESS)	
PRESS SD Page	CHECK
IRS Align	CHECK
Takeoff Briefing	PERFORM
Complete BEFORE ENGINES START CHECKLIST TO THE LINE.	

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

After Start Flow	
Engine Start Selector	NORM
APU Bleed	OFF
ENG Anti-Ice	AS REQD
Wing ANTI-Ice	AS REQD
APU Master Switch	OFF
Ground Spoilers	ARM
RUDDER TRIM POSITION (CHECK)	
RESET Push Button	PRESS
Flaps Lever	SET
Flaps	CHECK
Pitch Trim	SET / 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.	

Taxi-Out

Taxi Clearance	OBTAIN
NOSE Light	TAXI
Parking Brake	OFF
Brakes Pressure	ZERO
Thrust Levers	AS REQD
Brake Pedals	PRESS
Brakes	CHECK
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 Breaking MAX	ON
T.O. CONFIG	TEST
T.O. MEMO	CHECK
Cabin Report	RECEIVED
Complete BEFORE TAKEOFF CHECKLIST TO THE LINE.	

Line-Up Actions

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.	

Takeoff Actions	
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 SIDESTICK UNTIL 80KTS 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 (CHECK)	
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 TO THE LINE CHECKLIST.	

Above 10,000'	
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
FLT CTL	REVIEW
FUEL	REVIEW
DOOR	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
Landing Conditions (EFB PERF)	PERFORM
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
Minimums	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

FL100/10,000 FT Descent	
Land Lights	ON
Seat Belts	ON
LS	AS REQD
RAD NAVAIDS	SELECT
Engine Start Selector	AS REQD
NAV Accuracy	CHECK

Approach	
Breifing	CONFIRMED
ECAM Status	CHECKED
Seat Belts	ON
Baro Ref	SET
Minimums	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	
Flaps 1	ORDER
Flaps 1	SELECT
Flaps 2	ORDER
Flaps 2	SELECT
Landing Gear Down	ORDER
Landing Gear Lever	SELECT
Auto Break	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
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	
Auto Thrust	OFF
Autobrake	AS REQD
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
Retract flaps/slats on schedule	
Follow missed approach procedure	

Complete AFTER TAKEOFF/CLIMB TO THE LINE CHECKLIST.

After Landing	
Ground Spoilers	DISARM
Landing Lights Switch	OFF
Strobe Lights	AUTO
Nose Light	OFF
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	

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.	

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	OFF
Complete SECURING AIRCRAFT CHECKLIST.	