SimCheck Airbus A300B4-200

Quickstart manual

For use with Microsoft Flight Simulator X

SIMCHECK A300B4-200: QUICKSTART MANUAL

TABLE OF CONTENTS

INTRODUCTION

This Quickstart manual contains need-to-know information about the SimCheck A300B4-200 implementation and will get experienced sim-pilots up and flying quickly.
If you want to dig further into the complete manual and check lists, then please read the "normal procedures" manual or do the tutorial flight, and check out the panel orientation manual, which are also included in the SimCheck A300B4-200 package.

STARTING THE AIRCRAFT FOR THE FIRST TIME

Start up FSX. Load a flight using one of the default FSX aircraft (preferably the C172) and make sure the avionics and master switch are turned on. Then switch to the SimCheck A300B4-200. Now save the flight and use this saved situation next time you want to load the SimCheck A300B4-200.

The SimCheck A300 is a complicated simulation and FSX doesn't always like complicated add-ons. To avoid any problems during loading we strongly advice to first load the default Cessna 172 after starting up FSX and then load the SimCheck A300.

2D PANEL OVERVIEW AND LIMITATIONS

We have tried to make this panel as real as it gets, some (but not many) compromises had to be made however to make the panel usable for single pilot operations. All the systems have been simulated but some parts of the Flight Engineer (F/E) panel where not recreated.

Note: This panel does not work properly with FSX Shared Cockpit.

In order to get so many gauges and systems integrated into the 2D panel we have created 9 sub-panels, all the sub-panels can be reached with the panel switcher that is located in the top left corner of the 2D panel. If the panel switcher is hidden behind the menu bar, the press and hold the <alt-gr> button for a few seconds this will hide the FSX menu bar. Pressing <alt-gr> again will reload the menu bar.

Figure 1: Panel-switcher

The following key-shortcuts can be used:

- Shift-1 or 1: main captains panel
- Shift-2 or 2: FO panel
- Shift-3 or 3: hydraulics, brake temperature gauge and F/E engine instruments
- Shift-4 or 4: electrics panel
- Shift-5 or 5: overhead panel
- Shift-6 or 6: throttle quadrant
- Shift-7 or 7: fuel panel (with fuel dump), APU control panel and pitot heat switches
- Shift-8 or 8: pneumatics panel with packs controls, cabin pressurization system and temperature control
- Shift-9 or 9: communications panel
- Extra window: re-fuel/de-fuel gauge

FLIGHT PREPARATION

Before every flight you have to make sure you have enough fuel on board!

To calculate the correct flight time, fuel needed and optimum flight level, the SimCheck A300B4-200 package includes the A300B4-configurator.

A few things to keep in mind when loading fuel into the SimCheck A300B4-200:

- fuel must be loaded from outside to inside. So first the outer tanks (external 1 and 2), then the main wing tanks and finally the centre tank (will be done automatically with the fuel loader)
- the first hour of the flight (including the climb) will consume approximately 19 000 lbs of fuel, the following hours, fuel consumption will be around 14 000 lbs. So for a 2 hour flight, with 30 minute diversion time, 30 minutes holding fuel and 15 minutes contingency fuel you will need to load:

  1x 19 000 lbs

  2,25x 14 000 lbs

  = 50 500 lbs of fuel

This is a slight exaggeration of the fuel consumption because during descent less fuel will be used. Better to have some extra fuel onboard however than to be a few pounds short!

- normal cruising speed for the A300 is M.78 or approximately 450kts TAS
- if you can, use a flight planner that takes the current weather into account. Upper winds can have a very significant effect on the time of the flight and you shouldn't simply extrapolate the ground distance to time of flight
  For more information about using the "*A300B4 Configurator*", please read the manual that is included with the installation.

LOADING FUEL

Re-fuelling and de-fuelling can be done directly from the panel or by calling a fuel truck.

Re/de-fuelling can only be performed: while on the ground with the engines switched off !

On the main fuel panel (shift-7) click on the ?REFUEL/DEFUEL? zone to open or close the refuel gauge.

Power up the re/de-fuel gauge with the ON/OFF switch.

Figure 2: Fuel-loader

The yellow number (2) shows the current amount of fuel in all tanks, the red number (1) is the requested amount. You can increase/decrease the requested amount by right/left clicking the left or right section of the red number.

Once the desired amount has been set, select fast or slow to set the speed at which the fuelling is done and press "START".

"Slow" loading more or less reflects loading speed as one would encounter in real life, "fast" loading is double the normal speed.

The fuel will now be added or drained using the optimal filling process (outside tanks first), this can take some time as a lot of fuel needs to be drained or added !

ESTABLISHING ELECTRICAL POWER AND PNEUMATIC (FOR ENGINE START)

There are a number of ways to establish electrical power and air without actually starting the engines:

- DC power can be provided by the batteries; AC by using the DC/AC inverters. Battery power alone will give you approximately 30 minutes of power. No pneumatic pressure will be available though: You need an air source for that
- external power and air
- APU power and bleed air

External power and air

Using the batteries is pretty straightforward so let's skip that and look at how you can connect external power and air.

Note: To be able to connect external power the aircraft has to be on the ground.

- Open the set-up subpanel and click on the button next to "GROUND MENU"

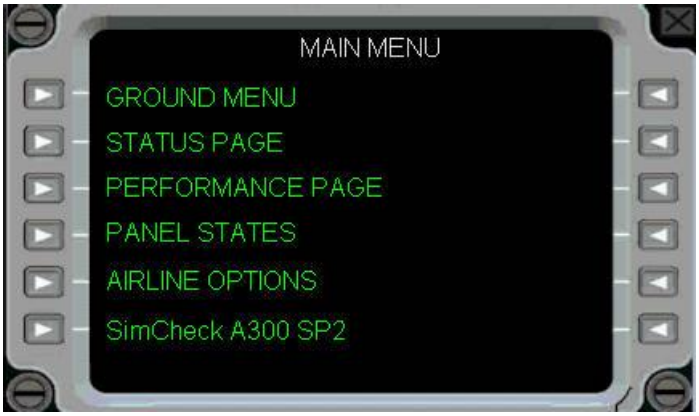

Figure 3: Set-up main menu

- Click on the button next to "CONN.EXT.PWR/AIR" to connect both external power (electrics) and air and close the set-up panel

Figure 4: Connect external power and air

- Now open the electrics panel and turn on the battery switches, and the 2 transfer switches, then turn on the external power, note that the "EXT PWR AVAILBLE" light should be on, the "EXT PWR ON" light will only come one after external power is established. Engine and APU power take precedence over external power so when either of these is available the "EXT PWR ON" will not come on.

Figure 5: External power switch

APU power

To start the APU you need: Electrical power (can be provided by the batteries) and fuel in the left wing tanks or the right wing tanks but then you have to make sure that fuel is cross fed from the right tanks to the left tanks.

- Open the fuel panel (<Shift-7>), on the top right hand side you see the APU panel.

Figure 6: APU section on fuel panel

- To start the APU, first move the "MASTER SWITCH" to the ON position
- Next press the "START" button. The button will light up bright blue and the APU start-up sequence will be completed automatically

Figure 7: APU start sequence

- Once the APU is up and running, close the fuel panel and open the electrics panel (<Shift-4>)
- Turn on the electrical power from the APU by moving the switch to the ON position

Figure 8: Connect the APU generator

- On the bleed panel (<Shift-8>) make sure the APU bleed air switch is in the "AUTO" or "OPEN" position

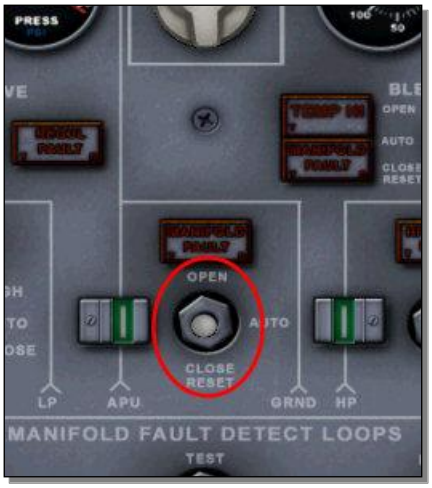

Figure 9: APU bleed switch in "AUTO"

- Once electrical power and bleed air are available you can start the engines (see below). If you have many electrical users on, you might get a generator overload error, to avoid this turn the load shed switch "On"

SPEEDBUGS

Once the fuel and cargo or passengers are loaded you can either enter the current gross weight manually or via a hidden click zone into the gross weight gauge.

Figure 10: Hidden click zone on weight gauge

Once the correct weight has been loaded into the gauge, a second hidden click zone can be pressed to automatically calculate and set the V-bugs on the airspeed indicator (ASI).

Figure 11: Hidden click zone to set speed bugs

Clicking this hidden zone while on the ground will set the V-bugs to the following speeds:

- White: V_1
  Speed up to which the pilot can decide to abort the take-off following critical failure (e.g. engine fire): Either to continue the take-off run within the limits of available takeoff runway length, or to stop the aircraft within the limits of available runway length. After V1 the pilot has to continue with the takeoff. Note: The gauge makes the calculations based on a 8500 feet runway.
- Orange speed bug: V_2
  Takeoff safety speed reached before the altitude of 35 feet with one engine failed
- Green: V_3
  Equal to 1.2x V_s (stall speed) with slats extended/flaps 0°. It is the minimum speed at which the flaps may be raised to 0° during the level acceleration at safety height after an engine failure after V1
- Yellow: V_4
  Equal to 1.25x V_s of slats 0°/flaps 0°. It is the minimum speed at which the slats may be retracted to 0° in the same situation as V_3 on one engine
- Red: V_{FTO}
  Final take-off speed to be reached on one engine at the end of the level acceleration and allowing best climb. On the A300B4 this is equal to 1.45x V_s in clean configuration. De facto this should be used as the minimum clean speed when requested by ATC

When airborne, clicking the hidden click zone on the ASI will set the bugs to the following speeds:

- Red: V_{FTO}
- Yellow: V_4
- Green: V_3
- Orange: not set automatically, has to be set via the auto-throttle speed window
- White: V_{app} (approach speed). Minimum landing speed using in full flaps/slats configuration and in zero-wind conditions

You can also manually drag the speed bugs to the desired position. To do so, left click on the location of the speed bug you want to drag and move the bug while pressing down the left mouse button.

Figure 12: Click and drag speedbugs

MAXIMUM SPEEDS

The A300 is quite sensitive to overspeed situations with flaps extended.
Maximum slat speed: 250 kts
Maximum speed flap 8: 215 kts
Maximum speed flap 15: 200 kts
Maximum speed flap 25: 180 kts
Overspeed will result in a clacker sound warning?

PARKING BRAKES

The parking brakes in the A300B4-200 are fed by a subsystem of the YELLOW hydraulic system. The yellow system is pressurized by the right engine (engine number 2) and a minimum pressure is required before the parking brakes will work. Off course it wouldn't make sense if you had to start the engines before the parking brakes could be set, therefore an AC driven electrical pump was installed to pressurize the brake accumulator (the same system is used in many aircraft like the Bae146).

Figure 13: Yellow accu pressure indicator and button

If the "Yellow accu pressure" is below 1500 psi, establish AC power and keep the "ELEC PUMP" push button depressed until the pressure reaches about 3000 psi. In the actual aircraft this should give you approximately 10 hours of parking brake action. In the panel I have reduced this to about 1 hour. The yellow accu pressure is passed from one flight to the next so when you save a flight and come back your aircraft a few days later the yellow accu pressure will be where it was at the end of the last session.

ENGINE START

Once all the pre-start preparations have been finished (load cargo/PAX, fuel, created a flight plan, programmed the INS, etc…) and you have received start-up clearance, you can start the engines !

Open the overhead panel (shift-5), the engine start gauge is located more or less in the middle of the panel

Move the "ENG START" rotating switch to start system A or B

Moving the "ARM" switch to *ARM* will initiate the start sequence. This will automatically close the packs valves and the start pushbuttons are lit for about 3 seconds.

Once the start lights are extinguished they can be pressed. We will start engine 2 first because this will provide pressure to the yellow hydraulic system (parking brake again), make sure the cross bleed rotating switch on the air bleed panel is set to any setting but "CLOSED". Pressing the start button will admit air to the starter by the start valve.

At approximately 20% N2 (main panel), open the fuel supply to the respective engine (pedestal panel Shift-6) and engine start will be completed.

Opening fuel at 20% should result in a smooth engine start. The starter will automatically close at 45% N2.

Now engine 1 can be started using the same procedure. In fact the APU or the external air source can now be turned off as bleed air can be used from engine 2 for starting engine 1.

MAXIMUM AND OPTIMUM CRUISE LEVEL

The "Status" page of the set-up panel shows the optimum and maximum cruising level for the current gross weight and selected Mach cruising speed.

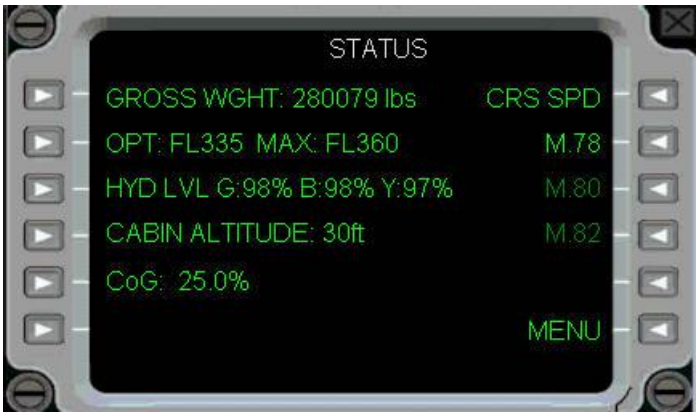

Figure 14: Set-up panel "Status" page

The top line of the status page shows the current gross weight (in pounds), the optimum and maximum cruising levels for either M.78, M.80 and M.82 cruising speed, the current hydraulic fluid levels for the Green, the Blue and the Yellow system and the present cabin altitude.

AUTOFLIGHT SYSTEM: AUTOPILOT AND AUTOTHROTTLE

Figure 15: Automatic flight control system

Finally a word on the autoflight system. This system is somewhat different from the "standard" Boeing and Airbus autopilots that you are probably used to.
The A300 has 2 autopilots (AP) and two flight directors (FD's). In fact the FD's are the primary instruments that provide information to the autopilots. The active autopilot mode can only be read from the failure and performance indicator (FPI).

Figure 16: FPI

GENERAL

The AP cannot be engaged while on the ground, the FD's can be however, and the FD bars will already show on the ground. Since the AP uses electricity, the automatic pitch trim system, the yaw dampers and the hydraulics systems, you have to make sure all of these are available (at least 1 yaw damper and 1 pitch trim needs to be engaged) before you can engage the AP.
To engage the auto-throttle (A/T) for take-off, the N1 computer has to be selected to Take Off (TO) or Flex Take Off (FLX TO) mode.

Figure 17: N1 Computer with TO and FLX TO mode selected

On the ground only N1 A/T mode is available, once airborne both N1 and Speed mode are available.
Note: The Master warning panel includes a hidden click zone to turn off the "THR OFF" warning lights.

Figure 18: Click zone to turn off THR OFF warning

HIDDEN CLICK ZONES ON AFCS PANEL

The autopilot can be controlled by the mouse and each settings can be changed by clicking either the left or the right mouse button changing the selected field by either +/- 1/100 or +/- 10/1000.

Figure 19: AFCS click zones

NORMAL PROCEDURES – AUTOPILOT OPERATION

Take-off, climb and cruise

Before take-off

AT SPD	Set speed to V_2 (automatic when clicking hidden zone on ASI)
N1 limit computer	FLX TO or TO
FD bars switch	Select ON
HDG knob	RWY heading selected
HDG sel	SELECT
ALT selector	FIRST CLEARED ALT
ALT ACQ	SELECT

Ready for T/O

ATS lever	ARM
TOGA button (bottom of main panel)	Press

Initial climb (gear up)

AP	OFF

Acceleration height

N1 limit computer	CL (or CR)
AT SPD	SELECT CLIMB SPEED (250kt typically)

(Decrease pitch to about 10° or slightly less to accelerate)

When the required climb speed is reached (trim)

AP	CMD
IAS mode	SELECT

When ALT ACQ in green illuminates on the FPI

AT SPD	SELECT DESIRED SPEED
AT SPD mode	SELECT

Climb from 5000-6000 feet at 250 kts (typical path)

ALT selector	SELECT 6000
ALT ACQ	SELECT

(At 6000 feet ALT ACQ green extinguishes and ALT mode engages automatically)

Climb to FL80 at 250 kts

ALT selector	SELECT 8000
AT N1 mode	SELECT
IAS (after trim)	SELECT
ALT ACQ	SELECT

(ALT ACQ will unselect when IAS mode is engaged and needs re-engagement each time)

When ALT ACQ green illuminates

AT SPD	SELECT

Recleared FL310 commencing climb whilst increasing speed to 300kts

AT SPD counter	SELECT 300kts
ALT selector	SELECT 31000
ALT ACQ	SELECT
A/T N1 mode	SELECT

Set pitch manually or using VSPD mode to a climb at about 1000 fpm until speed reaches 300 kts, once established at 300 kts:

IAS mode	SELECT

Again, this action disengages ALT ACQ…

ALT ACQ	SELECT

At the transition IAS/Mach (for M.78 FL290)

IAS	PUSH (OFF)

The correct Mach speed is maintained by using manual trimming or by using VSPD mode (the latter method has to be used in RVSM airspace)

Cruise

During climb

AT SPD	SELECT CRUISE SPD

When ALT ACQ green illuminates:

AT SPD mode	SELECT

When FL310 is reached, ALT mode engages automatically:

N1 Limit Computer	SELECT CR

Lateral modes

HDG SEL mode

HDG SEL knob	PRESELECT HDG
HDG SEL	SELECT

Bank angle is about 23° (+/- 2°), never select more than 160° heading change at a time or the autopilot will have difficulty knowing which way to turn.

VOR/LOC mode

NAV PANEL	VOR frequency SELECT
CRS knob	CRS SELECT
HDG SEL	SELECT
V/L	SELECT

NAV mode

The NAV mode works with the CIVA INS and will follow the HDG guidance given by the INS. The HSI will show distance, time and off track information

Capture and tracking of localizer

NAV PANEL	ILS frequency SELECT
CRS knob	CRS select
HDG SEL	SELECT
V/L	SELECT

(intercept course should be 30° or less different from the localizer front course for a smooth intercept of the LOC, Backcourse approaches are not possible in this panel configuration and are in fact forbidden in many airlines)

Descent / holding

Descent from FL350

We are at such a level that we will have to start descent at constant Mach number:

ALT selector	SELECT CLEARED LEVEL
ALT	DISENGAGE
ALT ACQ	SELECT
AT SPD	SELECT OFF

Descent from approx FL290 (slowly decrease throttle when IAS mode is selected)

SPD knob	SELECT DESCENT SPD
IAS	SELECT

When green ALT ACQ illuminates on FPI

AT SPD	SELECT

Descent to FL140 with 2500 fpm or more

ALT selector	SELECT 14000
IAS	SELECT
ALT ACQ	SELECT
AT disconnect	SELECT

Then reduce throttle slowly to initiate descent (to approx 60-65 N1) the lower the N1 the greater the descent rate…

When ALT ACQ green illuminates on FPI

AT SPD	SELECT

When FL140 is reached ALT ACQ extinguishes and ALT illuminates

Descent to FL120 and speed reduction to 250 kts

ALT selector	SELECT 12000
ALT ACQ	SELECT
AT SPD	SELECT 250

Descent FL120 to 4000 feet

Same as normal descent using IAS of VSPD mode

Approach and landing

Holding

Aircraft configuration: clean

AP (1 or 2)	CMD
ALT	SELECT
HDG SEL	SELECT
AT SPD	ARM/SELECT

Approach preparation

NAV PANEL	ILS frequency SELECT
CRS knob	RUNWAY HDG SELECT
DECISION HEIGHT	SELECT
N1 limit computer	SELECT GA
FLAPS 8° CONFIGURATION	ESTABLISH
AT SPD knob	SELECT 180kts

In order to reach 2 dots with Flaps 8° - 180kts

Base leg, cleared to intercept

HDG knob	SELECT INTERCEPT HEADING
APPR	SELECT

(The APPR mode must be selected before interception of the LOC)

LOC Capture (V/L green)

HDG knob	RUNWAY HDG SELECT

1 dot below the GLIDE

FLAPS 15° CONFIGURATION	ESTABLISH
LANDING GEAR	DOWN

(Landing gear selection may be delayed down to 1200 feet AGL, in such cases flaps 15°/V_3 has to be maintained down to landing gear selection)

ALWAYS capture the glideslope from BELOW !!!

AT SPD knob	SELECT FINAL TARGET SPEED

Glide capture (G/S green)	
SECOND FD	ENGAGE
When crossing V_3:	
FLAPS 25° CONFIGURATION	ESTABLISH
FINAL CHECKLIST	PERFORM

You can now make an autoland (CAT 2 or CAT 3a) or at 200 feet AGL (latest) disengage the AP and land manually (CAT 1), the second FD or AP has to be selected before reaching 1500 feet AGL.

When you follow these standard autopilot and auto-throttle operations you will be able to perfectly control the A300B4-200 in autoflight !