AW-609 LEONARDO

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FLIGHT MANUAL FOR X-PLANE 11

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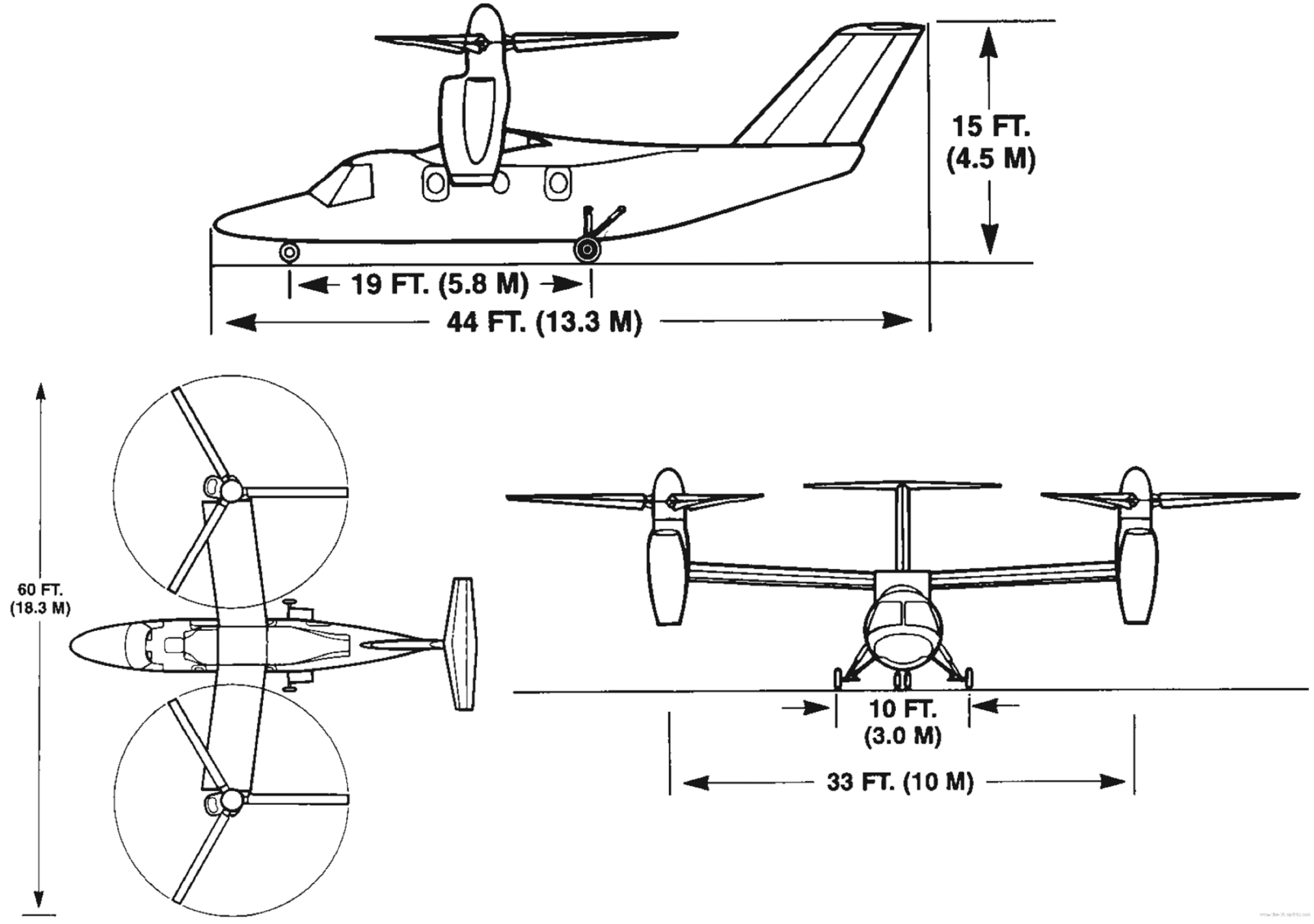
Overall dimensions.



The story of AW609

The BA609 drew on experience gained from Bell's earlier experimental tiltrotor, the XV-15. In 1996, Bell and Boeing had formed a partnership to develop a civil tiltrotor aircraft; however, in March 1998, it was announced that Boeing had pulled out of the project. In September 1998, it was announced that Agusta had become a partner in the development program. This led to the establishment of the Bell/Agusta Aerospace Company (BAAC), a joint venture between Bell Helicopter and AgustaWestland, to develop and manufacture the aircraft.

The Italian government subsidized Agusta's development of a military tiltrotor, and as the AW609 has civilian aspects, the European Commission requires AgustaWestland to pay back progressive amounts per aircraft to the Italian state to avoid a distortion of competition. As of 2015, Bell continues to perform contract work on the AW609 program while considering commercial potential for the bigger V-280 tiltrotor, where military production may reach larger numbers and hence reduce unit cost. However, in 2016, Bell preferred the 609 for commercial applications and kept the V-280 for military use only. Bell also stated that conventional helicopters were not part of Bell's future for military customers. The aircraft's purpose is to take off and land vertically, but fly faster than a helicopter.

Over 45 different aircraft have flown proving VTOL and STOL capabilities, of which the V-22, Harrier, Yak-38 and F-35 jets have proceeded to production. By 2008, Bell had estimated that very light jets and large offshore helicopters like the Sikorsky S-92 had reduced the potential market for tiltrotors. Also in 2008, it was reported that limited funding of the program by both Bell and AgustaWestland had resulted in slow flight testing progress.

On 21 September 2009, AgustaWestland chief executive Giuseppe Orsi said that corporate parent Finmeccanica had authorised buying Bell Helicopter out of the program to speed it up, as Bell was dissatisfied with the commercial prospects and wanted to spend the resources on other programs. In 2013 AgustaWestland estimated a market of 700 aircraft over 20 years. By 2011, negotiations centred on the full transfer of technologies shared with the V-22,

however Bell stated that no technology was shared with the V-22. At the 2011 Paris Air Show, AgustaWestland stated that it will assume full ownership of the programme, redesignating the aircraft as "AW609", and that Bell Helicopter will remain in the role of component design and certification. In November 2011, the exchange of ownership was completed, following the granting of regulatory approval - media estimated that the transfer happened at little cost

Link wikipedia source

https://en.wikipedia.org/wiki/AgustaWestland_AW609

General characteristics

Crew: 2
Capacity: 6 to 9 passengers *or* 5,500 lb (2,500 kg) payload
Length: 13.4 m (44 ft 0 in)
Wingspan: 10 m (32 ft 10 in) (distance between prop-rotor centres)
Width: 18.3 m (60 ft 0 in) rotors turning
Height: 4.6 m (15 ft 1 in) to top of fin
Empty weight: 4,765 kg (10,505 lb)
Max takeoff weight: 7,620 kg (16,799 lb)
Cabin height: 4 ft 8 in (1.42 m)
Cabin width: 4 ft 10 in (1.47 m)
Cabin length: 13 ft 5 in (4.09 m)
Powerplant: 2 × Pratt & Whitney Canada PT6C-67A turboshaft engines, 1,447 kW (1,940 hp) each
Main rotor diameter: 2× 8.3 m (25 ft 11 in)
Main rotor area: 49 m^2 (530 sq ft) each - 3-bladed prop-rotors

Performance

- **Maximum speed:** 509 km/h (316 mph, 275 kn)
  Cruise speed: 509 km/h (316 mph, 275 kn) maximum
  Range: 1,389 km (863 mi, 750 nmi) normal fuel + 2,500 kg (5,500 lb) payload at 463 km/h (288 mph; 250 kn)
  Ferry range: 1,852 km (1,151 mi, 1,000 nmi)
  Endurance: 3 hours with normal fuel
  Service ceiling: 7,620 m (25,000 ft)
  Hover Ceiling out of Ground Effect (HOGE): 1,525 m (5,003 ft)
  g limits: +3.1 -1
  Rate of climb: 7.616 m/s (1,499.2 ft/min) at sea level
  Disk loading: 77.4 kg/m^2 (15.9 lb/sq ft) max
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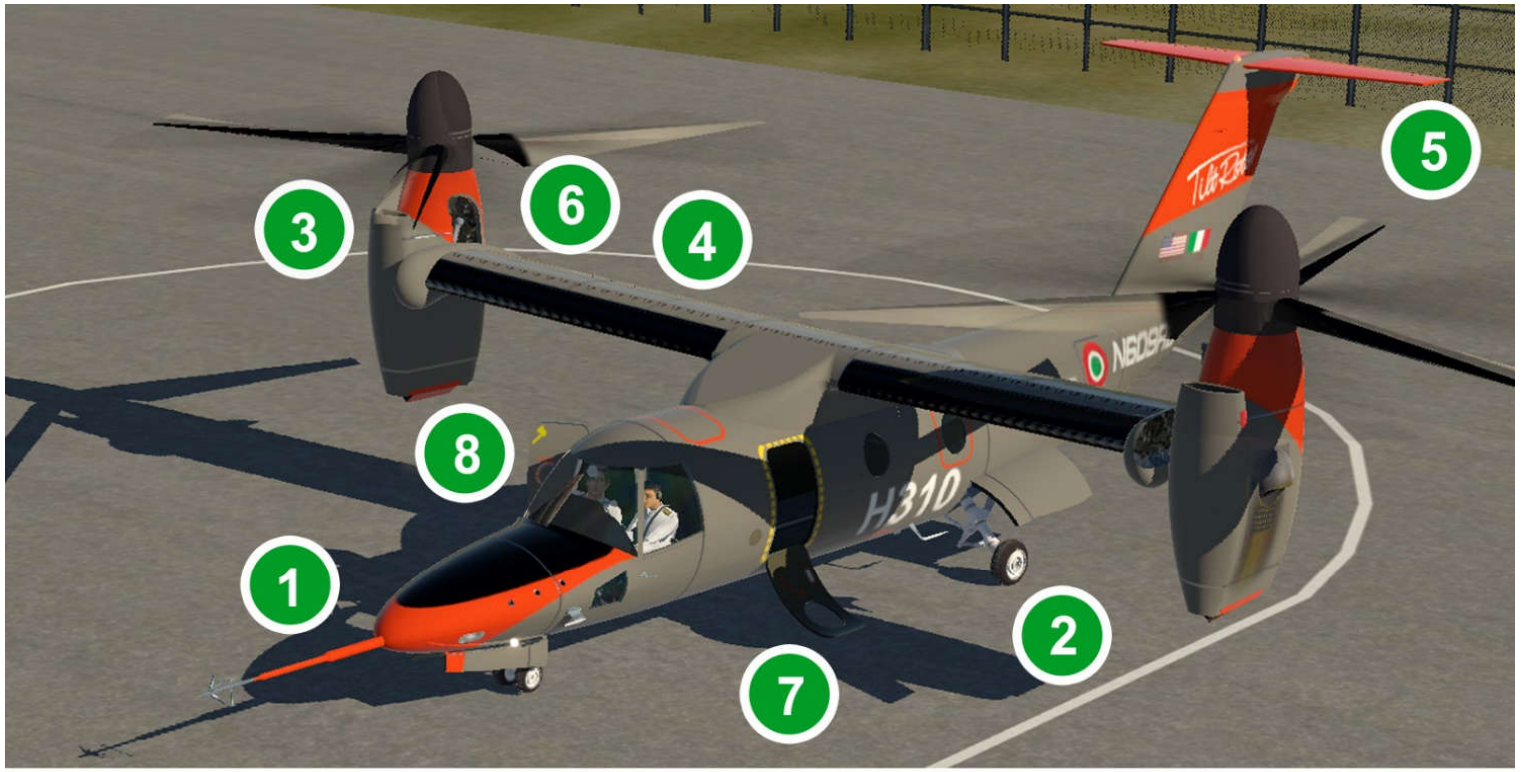
- Partial datas source: wikipedia

Presentation xplane model.



1 Radar, radome.
2 Landing gear.
3 Engine, tilt rotor.
4 Wings, airbrake.
5 Folding stabilator.
6 Flaps.
7 Left door.
8 Right door.

AW-609

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Liveries

Link for liveries :

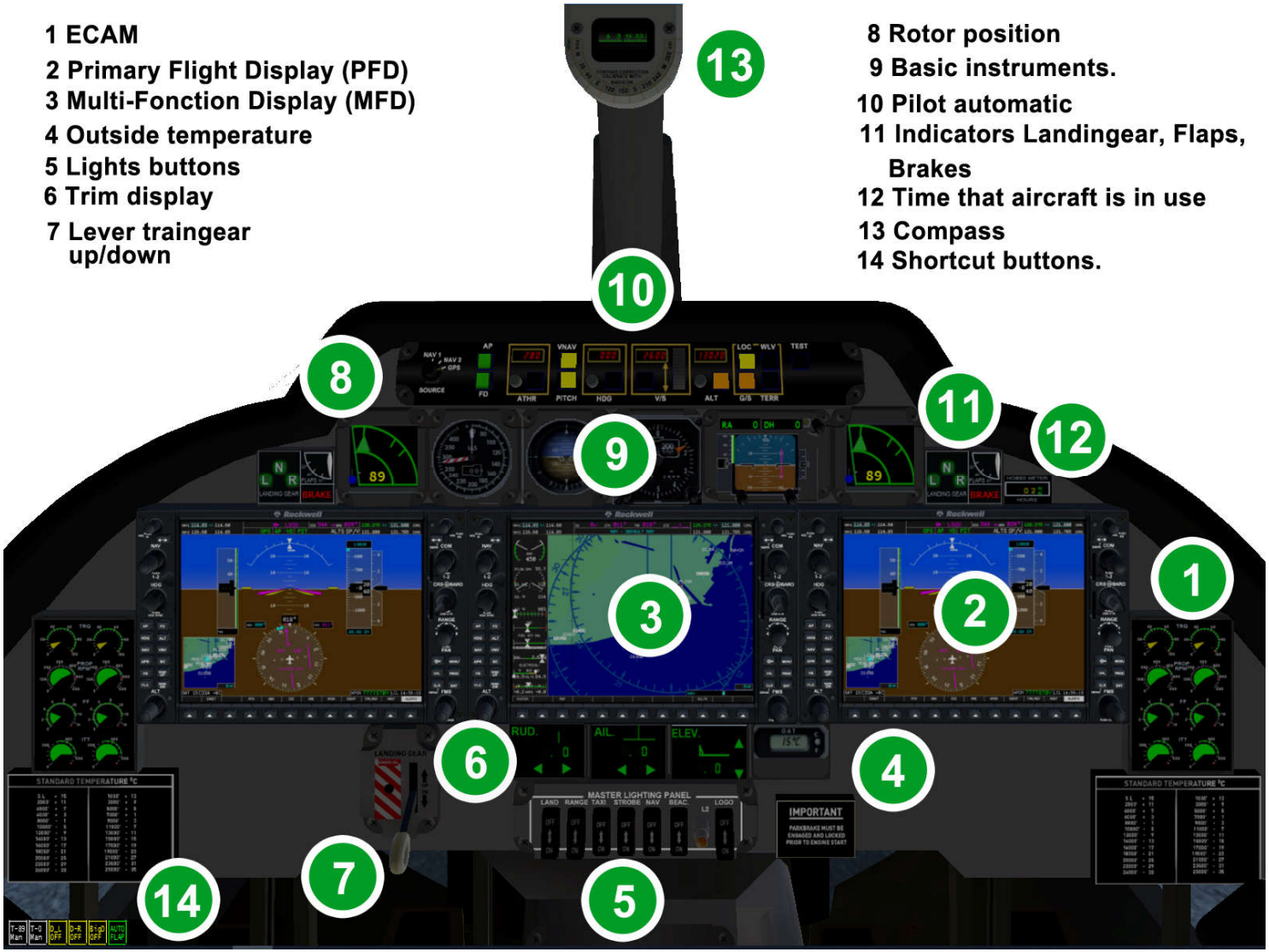
https://forums.x-plane.org/index.php?/profile/478765-pizzagalli/content/&type=downloads_file

Cockpit 3D

Front panel

1 ECAM
2 Primary Flight Display (PFD)
3 Multi-Fonction Display (MFD)
4 Outside temperature
5 Lights buttons
6 Trim display
7 Lever traingear up/down

8 Rotor position
9 Basic instruments.
10 Pilot automatic
11 Indicators Landingear, Flaps, Brakes
12 Time that aircraft is in use
13 Compass
14 Shortcut buttons.



Pilot automatic

https://forums.x-plane.org/index.php?/files/file/1799-austins-auto-pilot-how-to-pdf/

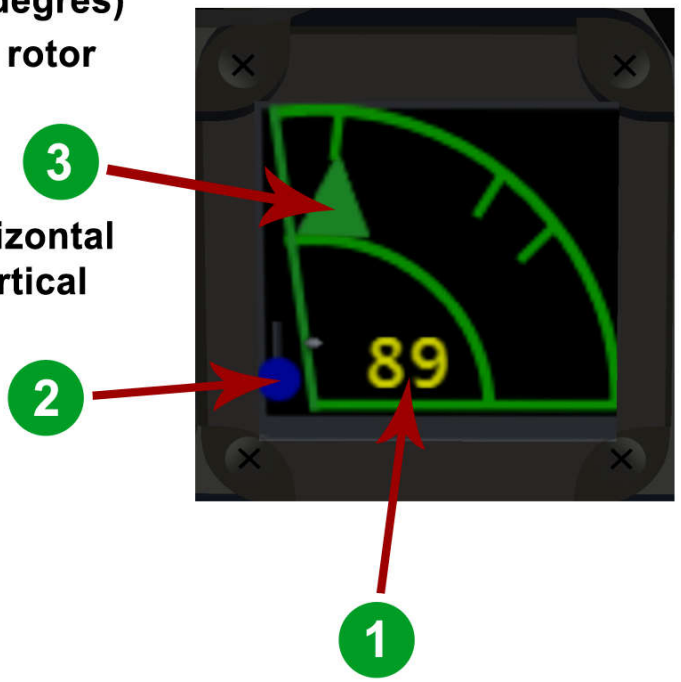
Basic instruments.

1 Airspeed indicator
2 Artificial horizon
3 Altimeter
4 Artificial horizon, airspeed & altimeter indicator
5 Rotor position (degres)
6 Landing gear indicator
7 Brakes indicator, click foractivate on/off
8 Flaps indicator
9 Time that aircraft is in use

Rotor position indicator.

1 Rotor position digital (degres)
2 Button change position rotor
3 Rotor position analogic

0 degre, rotor position horizontal
90 degre, rotor position vertical



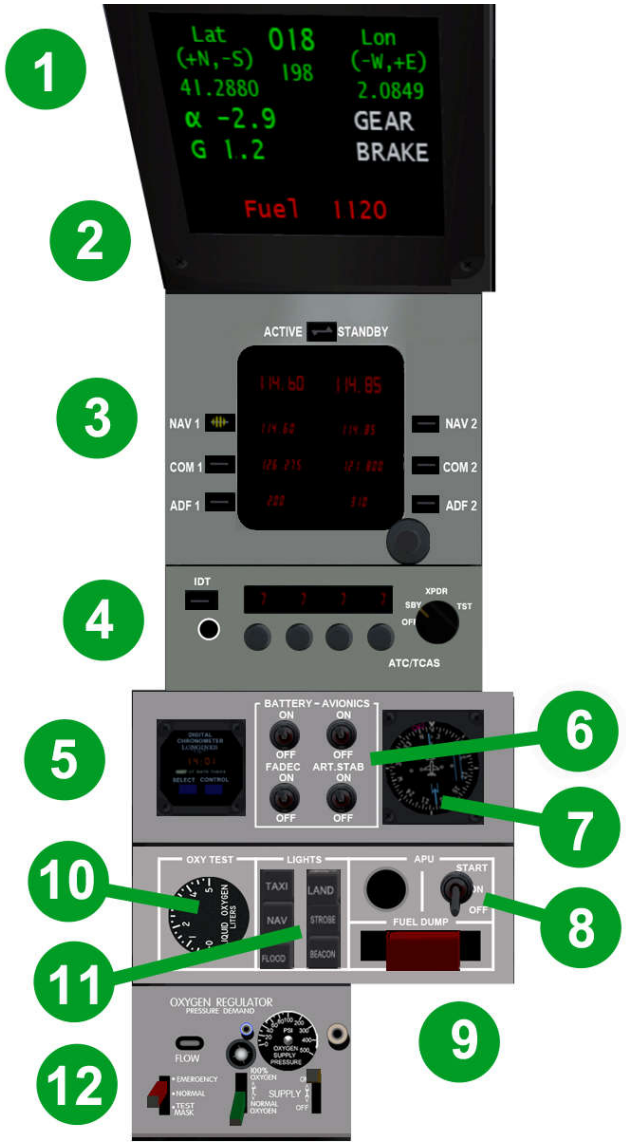
Moving the blue point (2) your change the angular position of the rotor

High panel

1 Generator on/off
2 Inverter on/off
3 Pitot on/off
4 Windshield on/off
5 De ice system on/off
6 Avionics on/off
7 Battery on/off
8 Bleed air on/off
9 Brightness front panel
10 Aditional light front panel
11 Brightness instruments
12 Brightness overhead
13 Indicator seatbelt on/off
14 Indicator no smoking on/off
15 Brightness low panel (pedestal)
16 Vipers actuator.
18 Buttons light on/off, landing, range, taxi, strobe, nav, beacon
19 Fuel pump, valve. on/off
20 Panel indicator alarm.
21 Hydraulics pumps on/off
22 Start engine.
23 Rotor brakes
24 Auto-tilt, 90° to 0°
25 Throttle
26 Fire extinguisher left
27 Fire extinguisher right

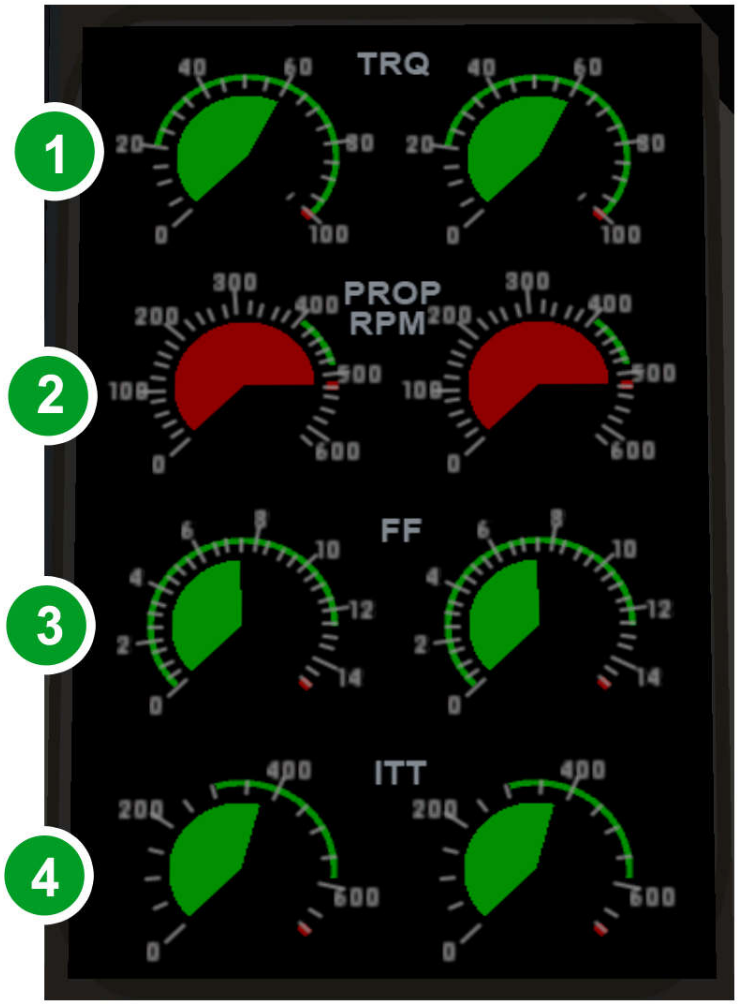
Low panel

1 Geographic coordinates,
latitude, geographic heading ,longitude.
angle of attack, acceleration vertical
indicator gear up/down, parking brake, airbrake.
2 Fuel quantity.
3 Radio navigation receiver
4 Transponder
5 Chronometer.
6 Battery, avionics, fadec, artificial stability on/off
7 HSI , Horizontal Situation Indicator.
8 APU on/off, APU running
9 Fuel dump.
10 Oxygen autonomy indicator
11 Lights, taxi, landing, nav, strobe, flood, beacon.
12 Ogygen regulator, bleed air.



ECAM panel

1 Engine torque to the propeller.
2 Speed engine.
3 Rate consuming fuel.
4 Temperature of exhaust gases.



Screen buttons

There are 6 click buttons.

1 Position of the rotor,88°.
White color : you can move the rotor manually
Green color :rotor move 88° automatically.
2 Position of the rotor,0°.
White color : you can move the rotor manually
Green color :rotor move 0° automatically.
3 Open, close left door, green color door is open
4 Open, close right door, green color door is open
5 Open, close lateral door, green color door is open
6 AutoFlap, green color Flap move automatically.

Logic of points 1 and 2:
When these buttons are green, they rotate the rotors as programmed, 0 ° or 88 °.
By clicking these buttons to put them in white color, it is possible manually to control the inclination of the rotors.
(with the small blue button on the front panel, or with page up or page down on the keyboard.)

Fly your AW-609

The AW609 addresses the need for an aircraft with the speed, range and altitude of a fixed-wing turboprop aircraft and the vertical versatility of a helicopter during take-off and landing.
This revolutionary combination, as well as the comfort of a pressurized cabin in which you can fly over the weather, makes the AW609 a real asset.
In order to transform a vertical flight helicopter into a plane with a horizontal flight, we use the tiltrotor, a real technical feat..

The AW609 is simple in concept, but complex in its execution.
Its pair of three-bladed, 26-foot in diameter “prop-rotors,” coupled to their 1,930 shp Pratt & Whitney PT6C-67A turboshaft engines, must lift its 16,800-lb bulk into the pure vertical.
They must then be able rotate forward and propeller the 44-foot-long, 33-foot-wide, 15-foot-tall airframe at forward speeds of 275 KTAS and altitudes of 25,000 feet MSL.
To accomplish this, the engines must simultaneously rotate back and forth between 95 degrees (straight up, plus another 5 degrees aft), and zero degrees (straight forward).
The engines must also be able to turn both rotor systems at any tilt angle as a team, or independently.
To make the units tilt as a matched set, the engineers employ one tilt-axis gearbox on each engine nacelle.
The 609’s rotor mechanism can best be described as a main rotor head that can rotate.
The pedals and toe brakes look normal, and control pivoting about the yaw axis. But they are not connected to a tail rotor, and there is no rudder. In a hover, pedal inputs change the pitch on the rotors cyclically, causing one or the other set to drive the aircraft’s nose around its yaw axis.

Engine start

1.Main battery On
2.Avionic On
3.Rotor brakes left and right off
4.Starter Left position start, 3 sec
4.Starter right position start, 3 sec.

It is the minimum for start the engine.
After you can start APU, generators and inverters.

Vertical takeoff

1. For takeoff, the nacelles are set at 87-88 degrees, see with the nacelle angle indicator, which is accomplished by clicking on the keyboard pageup page down. Or moving the blue point of the rotor (or nacelle) indicator.
2. The brakes can remain activated, this will prevent the aircraft from drifting.
3. Put the throttle in approximately three-quarter position, on the ECAM panel to 80% TRQ.
4. Gently pull on the handle to keep AW-609 horizontal.
5. Climb to a minimum altitude of 130 feet (radar altitude), higher is better, but also possible. At this point, you can click on the **T0 man** button. It will become green and the transition to 0 ° pods will be automatic.
6. Please check AW-609 to keep it horizontal.

There are many ways to take off, discover them with practice. The plane is stable.
The secret to landing – or taking off, for that matter – the tiltrotor is to select the nacelle angle that will deliver the
velocity and vertical speed you want for the various phases of your maneuver.

Normal takeoff (horizontal)

1. For takeoff, the nacelles are set at 45°, see with the nacelle angle indicator, which is accomplished by clicking on the keyboard pageup page down. Or moving the blue point of the rotor (or nacelle) indicator.
2. The brakes are not activated,
3. Put the throttle in approximately three-quarter position, on the ECAM panel to 80% TRQ.
4. Gently pull on the handle to keep AW-609 horizontal.
5. At this point, you can click on the T0 man button. It will become green and the transition to 0 ° pods will be automatic.
6. Please check AW-609 to keep it horizontal.

Normal landing (horizontal)

1. For a normal landing from 1000 feet, reduce the gas totally,
2. autoflaps engaged,
3. airbrakes on,
4. rotors at 45 ° minimum, this so that the blades of the propellers do not collide the ground.
5. Put the throttle slightly and maintain a low speed of about 100 KIAS,
6. adjust the throttle to maintain a descent of 1500 ft / min, 2000 ft / min maximum.

   The landing gear automatically comes out at 300 feet.
7. Once touchdown, minimize the throttle,
8. incline the rotor to 70 ° minimum,
9. engage the brakes.

To move in taxi mode, the rotors must be inclined at least 89 °.

The configuration below shows how AW609 should be in the normal landing phase.

Vertical landing

For a vertical landing from 1000 feet:

1. Reduce the throttle totally,
2. autoflaps engaged,
3. airbrakes on,
4. Wait until the speed is about 120 knot
5. rotors at 88 °
6. Locked the wheel brakes
7. Slightly throttle to support the vertical descent.
8. Adjust the throttle to maintain a descent of 1500 ft / min, 2000 ft / min.
   The landing gear will automatically exit at 300 feet
9. Put the throttle slightly and maintain a low speed of about 100 KIAS,
10. adjust the throttle to maintain a descent of 1500 ft / min, 2000 ft / min maximum.

    The landing gear automatically comes out at 300 feet.
11. Control the descent while maintaining AW-609 horizontal.
12. Once hit the ground, reduce the throttle as much as possible.

There are many ways to landing, discover them with practice.

The configuration below shows how AW609 should be in the vertical landing phase.

Keyboard shortcut.

1.Shift + F2: Open-close left door
2. Shift + F3: Open/close right door
3. Shift + F4: Open/close left big door.
4. Shift + F11: Active /desactive autoflap.

Links:

http://www.x-plane.com/manuals/desktop/

http://wiki.x-plane.fr/index.php?title=Sommaire

http://wiki.x-plane.fr/index.php?title=Le_FMS

for automatic pilot

http://wiki.x-plane.fr/index.php?title=Le_pilote_automatique_:_D%C3%A9butants

for automatic landing

Support

The support and question-answer are on the site x-plane.org forum.

https://forums.x-plane.org/index.php?/forums/topic/192599-aw-609-cockpit-3d-support-and-questions

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