

LATÉCOÈRE 631

—
USER MANUAL



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Aircraft history:

The Model 631 is an all-metal, high-wing, 6-engine flying boat designed and manufactured by France's Latécoère. A great source of French national pride, its initial development was hindered due to World War II. Latécoère persevered, however, and ultimately built 11 models, including one prototype. The large, elegantly-shaped Model 631 first took to the sky on November 4, 1942. The hydroplane's introduction was delayed for years after its maiden flight due to German occupation, but finally debuted commercially in 1945.



The Model 631 was the largest flying boat in the world for a number of years. Only the American Hughes H-4 Hercules "Spruce Goose," which flew just once on November 2, 1947, and the British Saunders-Roe Princess, which took its maiden flight on August 22, 1952, were larger. The last of the great trans-oceanic flying boat airliners, the Model 631 flew until the mid 1950s.

Latécoère, which was established in 1917, had built a long history of successful aircraft by the mid-1930s, including a number of flying boats. The Model 631, which would be its largest (and last) hydroplane, was conceived based on a 1936 request by the French Civil Aviation Authority for an airliner that could carry 40 passengers and would have a range of at least 2,500 miles. Work began in 1938, but was halted due to World War II. The Model 631 prototype finally took to the sky on November 11, 1942 but was seized by Germany and flown to Lake Constance, where it was destroyed by a British bombing attack in April of 1944. The French, however, had hidden a second Model 631. That aircraft, the first of ten

production models, flew for the first time on March 7, 1945 and demonstrated to the world that France's aviation industry had survived the war—and was ready to soar.



The Model 631, which serviced routes in Africa, Europe, Asia and South America, was typically crewed by five and could accommodate up to 46 passengers. It flew for ten years, until 1955. Unfortunately, many crashed, and the remains of all were scrapped.

The beautiful aircraft measured 142 feet, 7 inches in length, stood 33 feet, 2 inches above the water, and had a wingspan of 188 feet, 5 inches. Its tail unit comprised a V-shaped stabilizer with a vertical stabilizer and rudder on each end. The hydroplane was powered by six 14-cylinder Wright R-2600-C14 Cyclone radial piston engines. Each powerplant turned out up to 1,600 horsepower and swung a 3-blade, constant-speed propeller. The Model 631 had a range of 3,750 miles, cruised at 173 miles per hour, and had a top speed of 223 mph.



Commercial destinations for the Latécoère 631:



Map from Pascal Parpaite's book *L'exploitation des latécoère* 631 P.360

Features:

The Latécoère 631 comes with a variety of features to optimize the realism of simulated flight. Please carefully read through these features for the best flying experience.

The Clipboard:

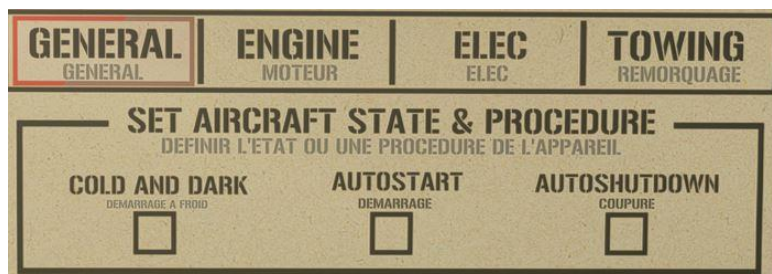
The clipboard is located at the bottom of the central pilot's panel. Click on the metal retention clip to change its position. The clipboard holds four pages of information:



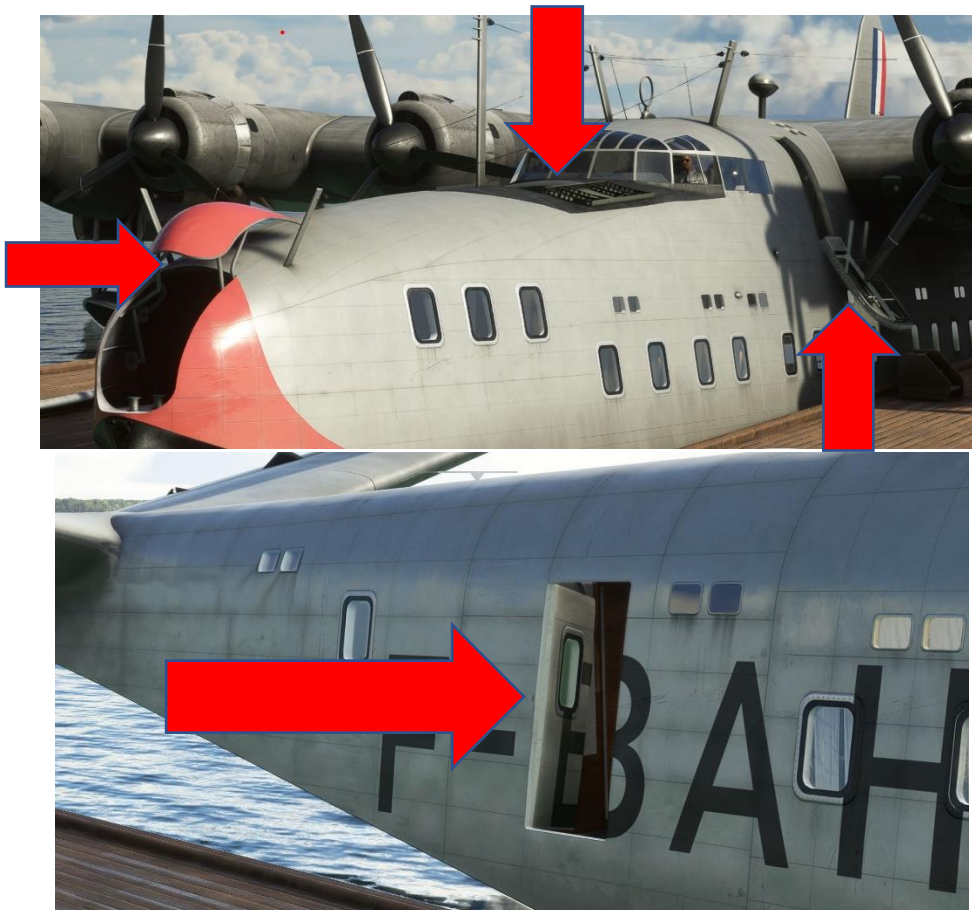
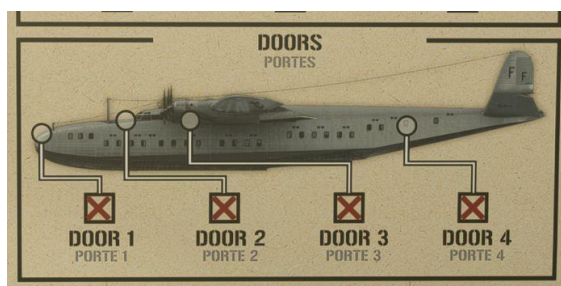
GENERAL:

Different situational conditions may be set, including:

- "COLD AND DARK" will set the entire aircraft in cold and dark mode.
- "AUTOSTART" acts as CTRL+E and will automatically start the aircraft.
- "AUTOSHUTDOWN" acts as SHIFT+CTRL+E and will power down the aircraft.



The aircraft's doors can be opened and closed using the following interface:



The bottom of Page 1 has a list of aircraft items that can be revealed or hidden:

- The national flag
- The dock
- The anchor buoys
- The engine covers

Each of these elements can be activated only if the aircraft is on water.

The dock and the anchor buoys will also keep you from drifting uncontrolled on the water.



ENGINE:

Page 2 shows current levels of all fuel and oil tanks. All tanks may be filled to 100% with a mouse click. Note that this page is very useful as this cockpit version does not have fuel level indicators. Each oil tank has a capacity of 300L and required a refill every 60 hours of flight.

ELECTRICAL:

Page 3 provides the pilot the ability to control a range of electrical systems, including:

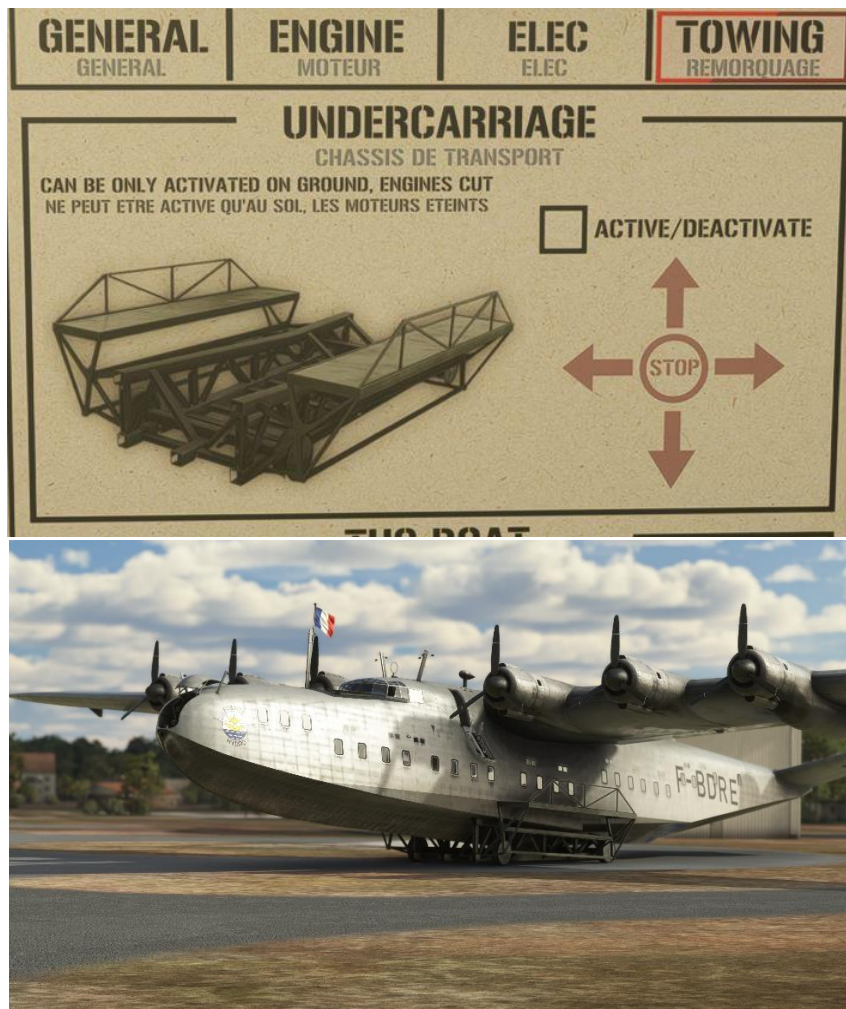
- GENERATORS: Set ON/OFF
- APU: Start/Stop
- Cockpit or Passenger Lights: Set ON/OFF
- AVIONICS: Display/Hide



Towing:

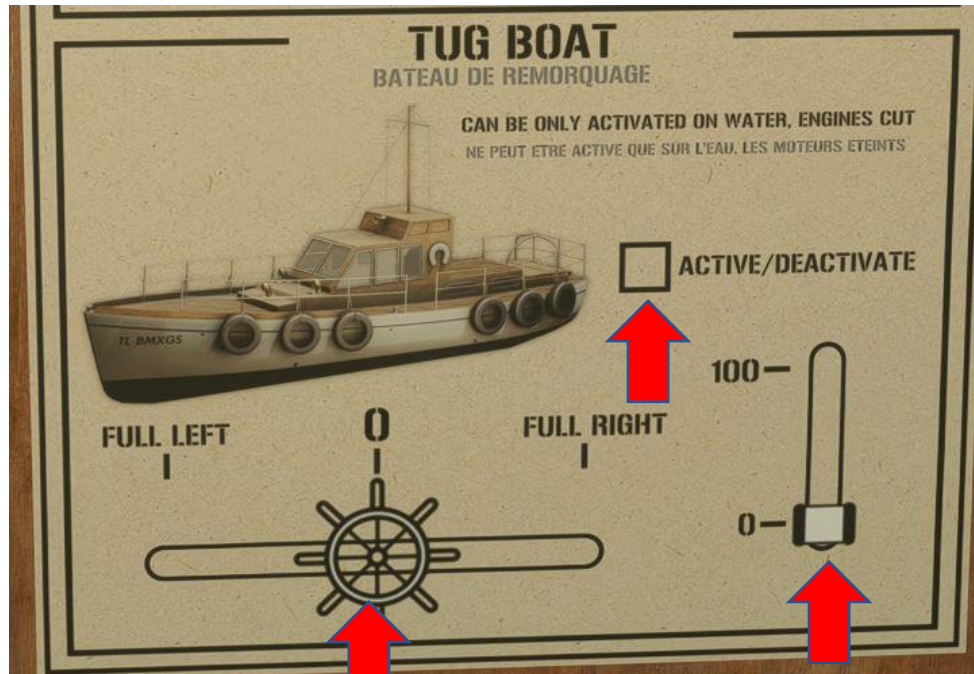
The Last Page provides means for control of the undercarriage and the tug boat:

The undercarriage can be activated or deactivated with the box, and it can be precisely controlled with the 4-way directional indicator and be stopped with the central stop button.



NOTE: This feature is for ground positioning only; the aircraft cannot launch or land with it enabled and control is only via the 4-way arrow control.

The Tug Boat can only be activated when aircraft engine's are powered off. Click the ACTIVATE/DEACTIVATE box to activate the tug boat and guide it using the rudder control and the throttle (to the right of the rudder control).



Passenger cabins:

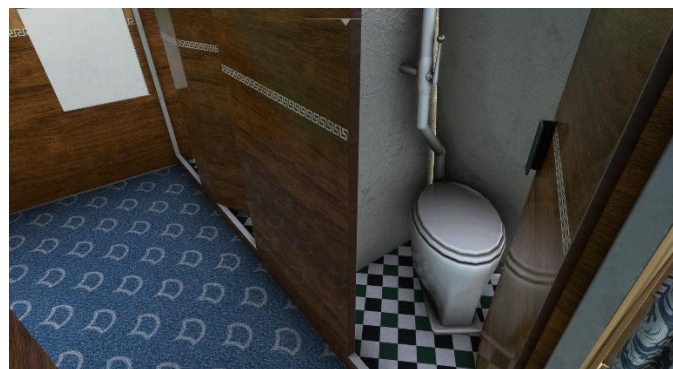
The multiple passenger cabins of the Latécoère 631 offered exceptional comfort. The cabins were carefully and thoughtfully designed for both travelers seeking the ultimate in luxury as well as for flight crew efficiency and practicality. Each space was diligently crafted to provide a warm and welcoming ambience, ensuring a pleasant journey for all on board.



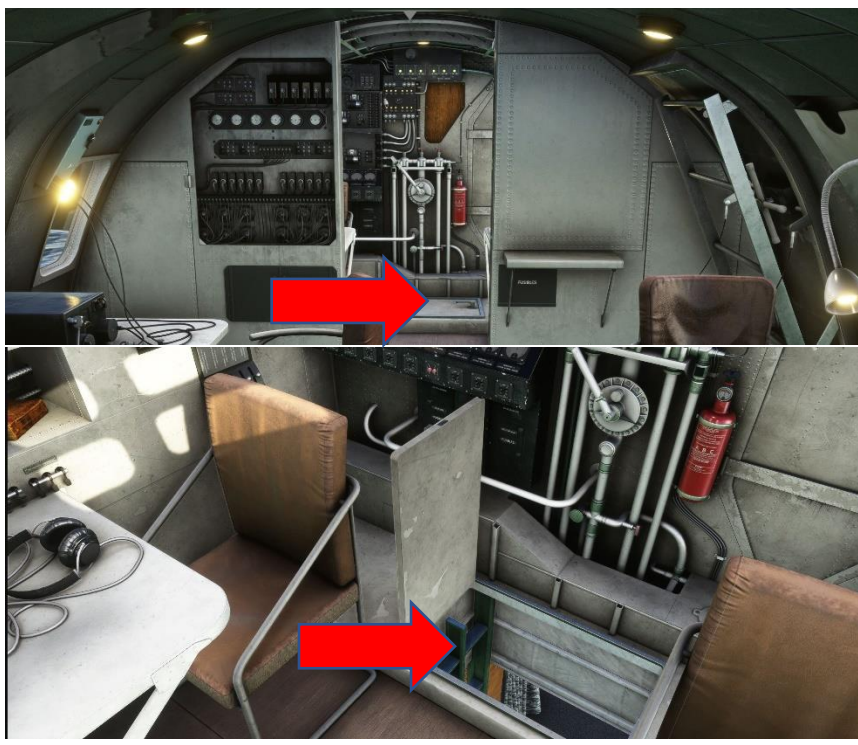
Another remarkable feature of the Latécoère 631 was its fully equipped galley (kitchen). Aware of the importance of quality in-flight meals, the aircraft's designers integrated a spacious and fully functional kitchen on board. Crew members could prepare delicious meals for passengers, guaranteeing an exceptional culinary experience throughout each flight.



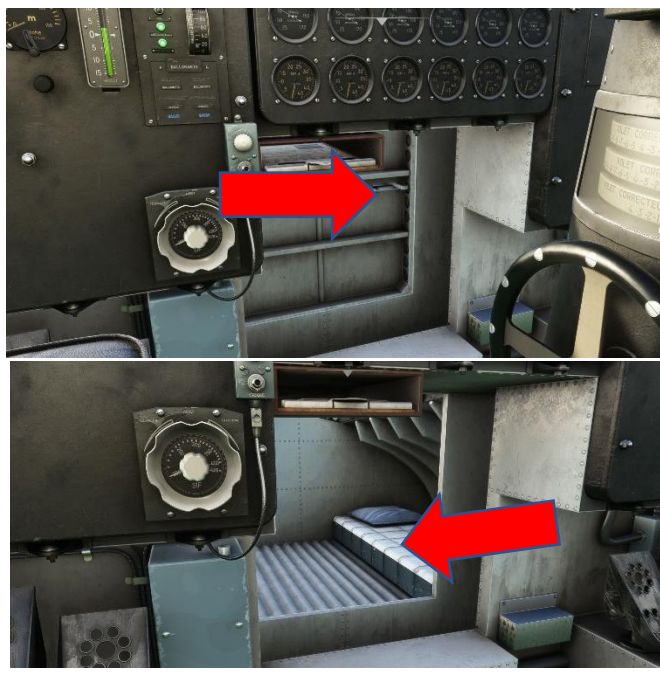
The Latécoère 631 also featured modern, well-appointed lavatories, offering passengers comfort and privacy. These sanitary facilities were carefully designed to meet the highest standards of hygiene and convenience, helping to make the journey even more enjoyable for everyone on board.



Accessing the passenger cabin from the cockpit:

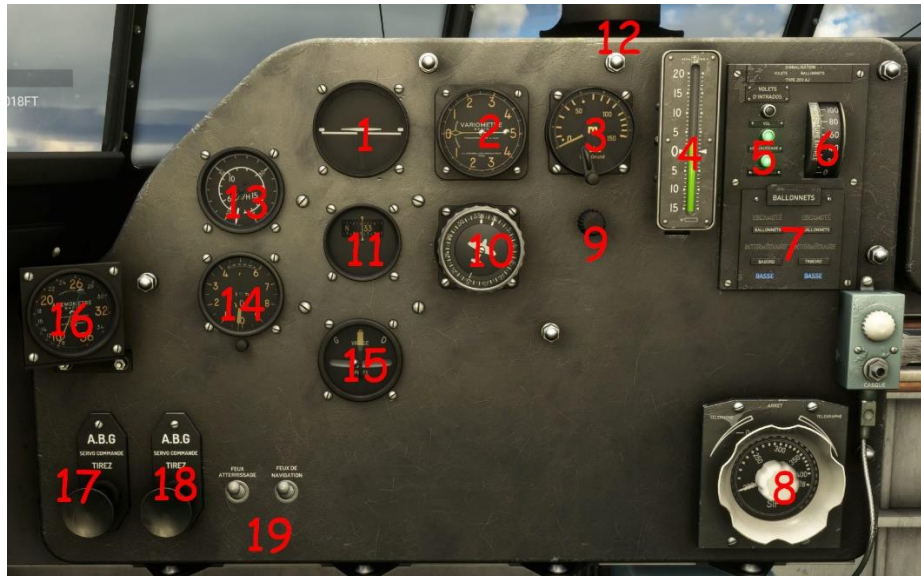


In addition to the passenger cabins, the Latécoère 631 also featured a bedroom in the cockpit, offering crew members the chance to rest during long-haul flights. Equipped with comfortable bunks, it enabled crew members to recuperate and remain operational throughout each journey.



Instrumentation Overview:

Left pilot panel:



- 1- Attitude indicator
- 2- Vertical Speed Indicator (from -5 to 5 meters per second)
- 3- Height-Above-Ground Altimeter (Höhe Uberground)
- 4- Aircraft Pitch Indicator
- 5- Flaps Level Indicator Lights: Up or Full Down 0° – 17°
- 6- Engine 1 Oil Temperature Indicator (in degrees Celsius)
- 7- Floats Level Indicator Lights (Up – Mid – Down)
- 8- SIF (sound intermediate frequency) Knob Selector (used for Radio-goniometric navigation - see upcoming updates if not already added).
- 9- Panel Light Dimmer Knob
- 10- Heading Compass Selector (used for heading visualization only)
- 11- Magnetic Compass
- 12- Vion Compass
- 13- Anemometer (Air Speed Indicator); 0 – 350 km/h
- 14- Altimeter (in Meters)
- 15- Turn and Slip Indicator
- 16- Anemometer (Air Speed Indicator) 0 – 360 km/h
- 17- Servo Command Switch -> Ailerons
- 18- Servo Command Switch -> Elevators

Center pilot panel:

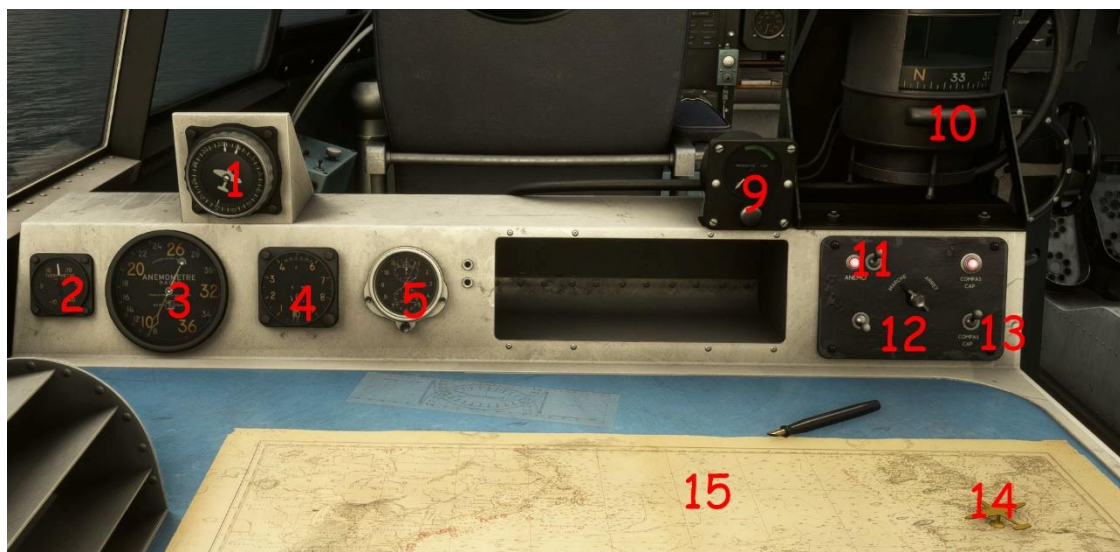
- 1- Engine 1-6 manifold pressure
- 2- Engine 1-6 Rpm

Right pilot panel:

- 1- This Communication tube was used to talk to the docking personnel at the front of the aircraft.
- 2- Aircraft Pitch Indicator
- 3- Heading Compass Selector (used for heading visualization only)
- 4- Anemometer (Airspeed Indicator); 0 -350 km/h
- 5- Attitude Indicator
- 6- Turn and Slip Indicator
- 7- Altimeter (in meters)
- 8- Magnetic Compass
- 9- Vertical Speed Indicator + Pitch Indicator (in meters per second and degrees)
- 10- [Unlabeled instrument]

Pylon:

- 1- Engine 1-6 Throttle
- 2- Flaps Switch
- 3- Floats Switch
- 4- Autopilot Gyroscope Switch (used to active the autopilot)
- 5- Autopilot Master Switch
- 6- Altitude Hold Switch
- 7- Heading Hold Switch
- 8- Rudder, Aileron, and Elevator Trim Indicators
- 9- Elevator Trim Wheel
- 10- Aileron Trim Wheel
- 11- Rudder Trim Wheel

Left Navigation table:

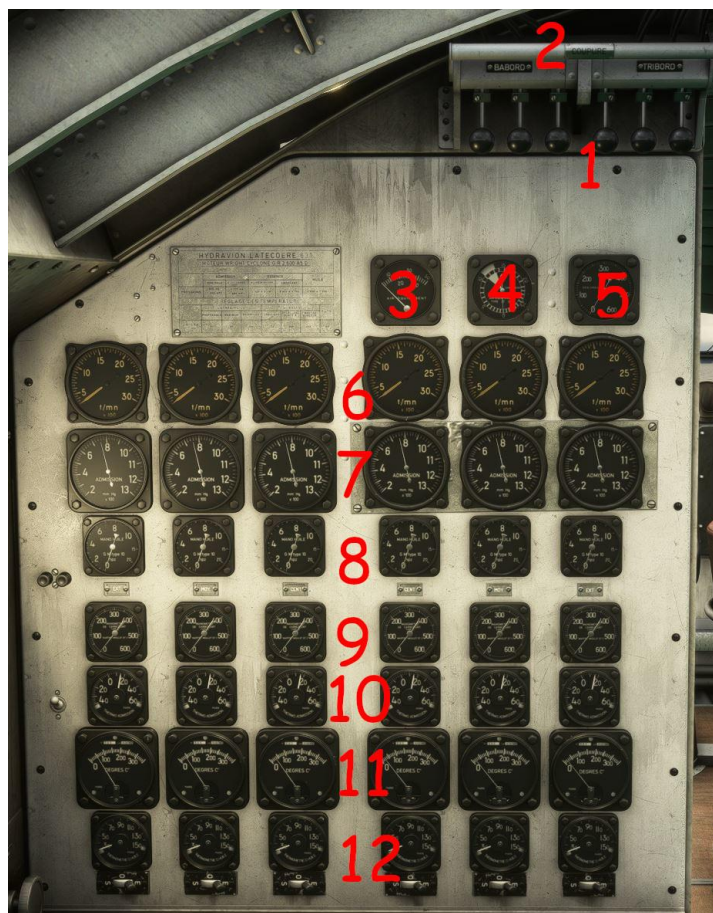
- 1- Heading compass selector, used for heading visualization only
- 2- Exterior Temperature (in degrees Celsius)
- 3- Anemometer (Airspeed Indicator) 0-360 km/h
- 4- Altimeter (in meters)
- 5- Watch and Chronograph
- 9- Vion Compass Pressure Indicator
- 10- Vion Compass Pressurized
- 11- Anemometer Power Supply Switch
- 12- Table Instruments Power Supply Switch
- 13- Heading Compass Power Supply Switch
- 14- Aircraft Latitude and Longitude Indicator
- 15- Atlantic Ocean Map

Right Navigation table:

- 1- Goniometric Wheel (see Radio-goniometric navigation in the upcoming updates if not already available).
- 2- Cabin Light Switches
- 3- Morse Code Key
- 4- Navigation Frequency Knob Selector
- 5- Navigation Volume Knob
- 6- Comm 1 Frequency Knob Selector
- 7- Comm 1 Volume Knob
- 8- Morse Code Key
- 9- Comm 2 Frequency Knob Selector
- 10- Comm 2 Volume Knob
- 11- Morse Code Key

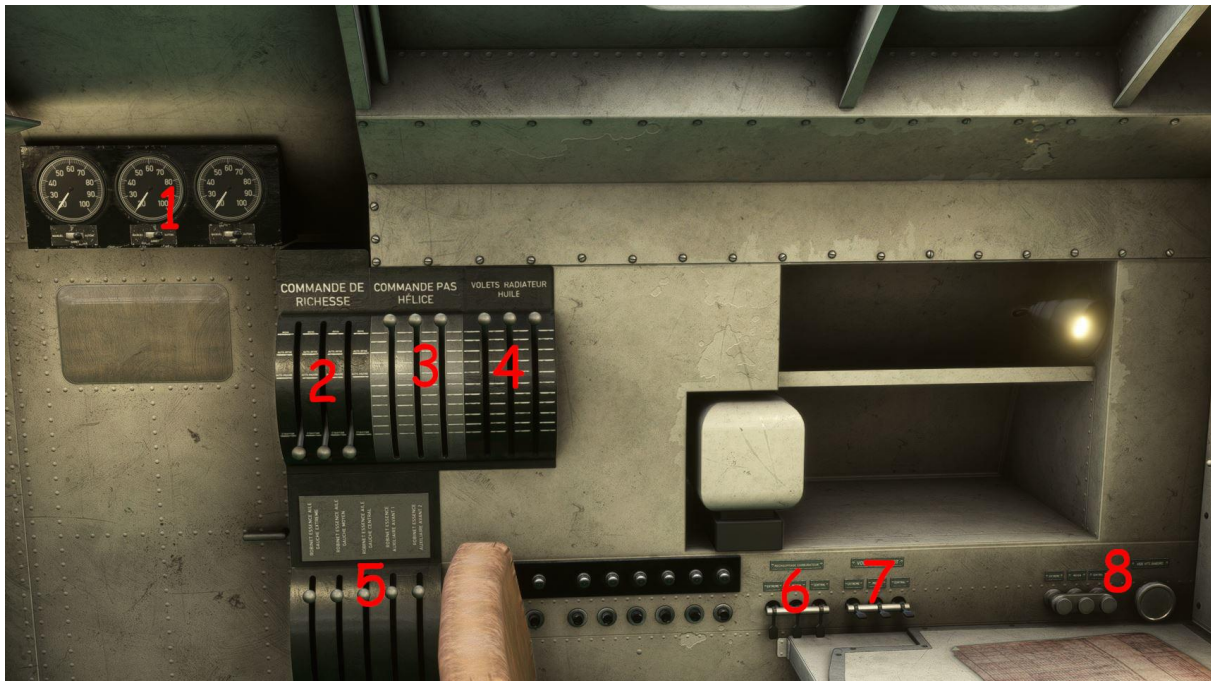
Right Mechanical panel:

- 1- Altimeter (in meters)
- 2- Anemometer (airspeed indicator); 0-360 km/h
- 3- Low Fuel and Low Oil Pressure Indicator Lights
- 4- Starter Power Supply Switch (required to be ON to use starters)
- 5- Engine 1-6 Starter Switches
- 6- TBD
- 7- Master Battery Switch
- 8- Oil Heaters Switches and Indicators
- 9- Total Fuel Consumption Indicator Supply Switch
- 10- Instant Fuel Consumption (Rate) Indicator Supply Switch

Left Mechanical panel:

- 1- Engine 1-6 magnetos switch
- 2- Master Magnetos cut lever
- 3- Air Pressure Indicator Circuit 1
- 4- Air Pressure Indicator Circuit 2
- 5- Not Used
- 6- RPM Indicators
- 7- Manifold Pressure Indicators
- 8- Oil Pressure Indicators
- 9- Fuel Pressure Indicators
- 10- Thermo Admission Temperature
- 11- Cylinder Temperature Indicators
- 12- Oil Temperature Indicators

Mechanical Room Side Instruments and Levers



- 1- Propeller Pitch Indicators
- 2- Fuel Mixture Levers
- 3- Propeller Pitch Levers
- 4- Oil Cooling Flaps Levers
- 5- Fuel valves (see fuel system)
- 6- Carburetor Heating Switches
- 7- Cowl Flaps Switches
- 8- Fuel Dump Switches (see fuel system)

Electrical panel



- 1- Propeller Pitch Electrical Current Indicator
- 2- Electrical Pitch Supply Lights Indicator
- 3- Engine 1-6 Booster Pump Lights Indicator
- 4- Booster and Transfer Pump Switch (depending if the fuel valve (8) is open)
- 5- Auxiliary Fuel Tank 1-6 Transfer Pump Lights Indicator
- 6- Primer Circuit Valve
- 7- Manual Transfer Pump Fuel Valve (to transfer fuel from auxiliary tanks to wing tanks when using the manual pump)
- 8- Electric Transfer Pump Fuel Valve (to transfer fuel from auxiliary tanks to wing tanks when using the electric pump)
- 9- Manual Fuel Transfer Pump
- 10- Connection Circuit Switch (when OFF, only vital equipment is powered).
- 11- APU Start and Cutoff Switches
- 12- Engine Generator Switches - Left Wing
- 13- APU Generator Switches
- 14- Engine Generator Switches - Right Wing
- 15- Generator Electrical Current Indicator - Right Wing
- 16- Generator Electrical Current Indicator - APU
- 17- APU RPM Indicator
- 18- Generator Electrical Current Indicator - Left Wing
- 19- Voltage Bus Selector
- 20- Main Bus Current
- 21- Selected Bus Voltage
- 22- Main Bus Voltage
- 23- Emergency Propeller Pitch Supply
- 24- Propeller De-Ice Switch

Checklists:

LATECOERE 631 CHECKLIST	
CHECK BEFORE STARTING ENGINES	
- MASTER BATTERY	ON
- MAGNETOS ENGINES 1-6	CUT
- THROTTLE LEVERS	FREE TO MOVE AND REDUCE TO 1+cm
- COWL FLAP	FULL OPEN
- APU	ON
- PRIMING VALVE	OPEN
- ELECTRICAL FUEL PUMP	ON
- MIXTURE LEVERS	CUT

LATECOERE 631 CHECKLIST

ENGINES START-UP

- PROP LEVERS
- STARTER ENGINE 3
- MAGNETOS ENGINE 3
- MIXTURE LEVER ENGINE 3
- ENGINE RPM
- ENGINE OIL PRESSURE

HIGH PITCH
ON
ON
RICH
BRING THE ENGINE TO 1000RPM
INCREASES NORMALLY

REPEAT THIS OPERATION FOR THE ENGINES IN
THE FOLLOWING ORDER: 3 - 4 - 2 - 5 - 1 - 6

- ELECTRICAL FUEL PUMP
- PRIMING VALVE
- ENGINES RPM
- ENGINES RPM
- ENGINES GENERATOR
- APU
- PROP LEVERS

OFF
CLOSED
BRING THE ENGINES TO 1200 RPM
BRING THE ENGINES TO 1500 RPM
ONCE THE OIL TEMPS ARE ABOVE 50°C
ON
OFF
LOW PITCH

Fuel system:

Fuel dump system:

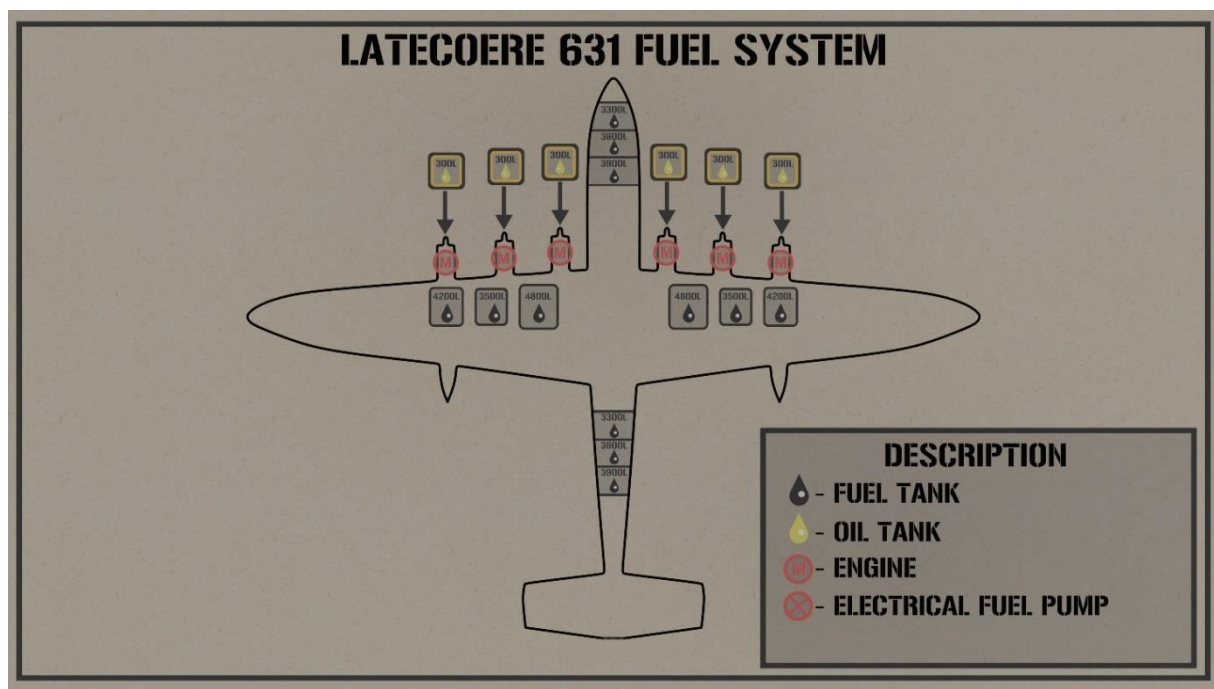
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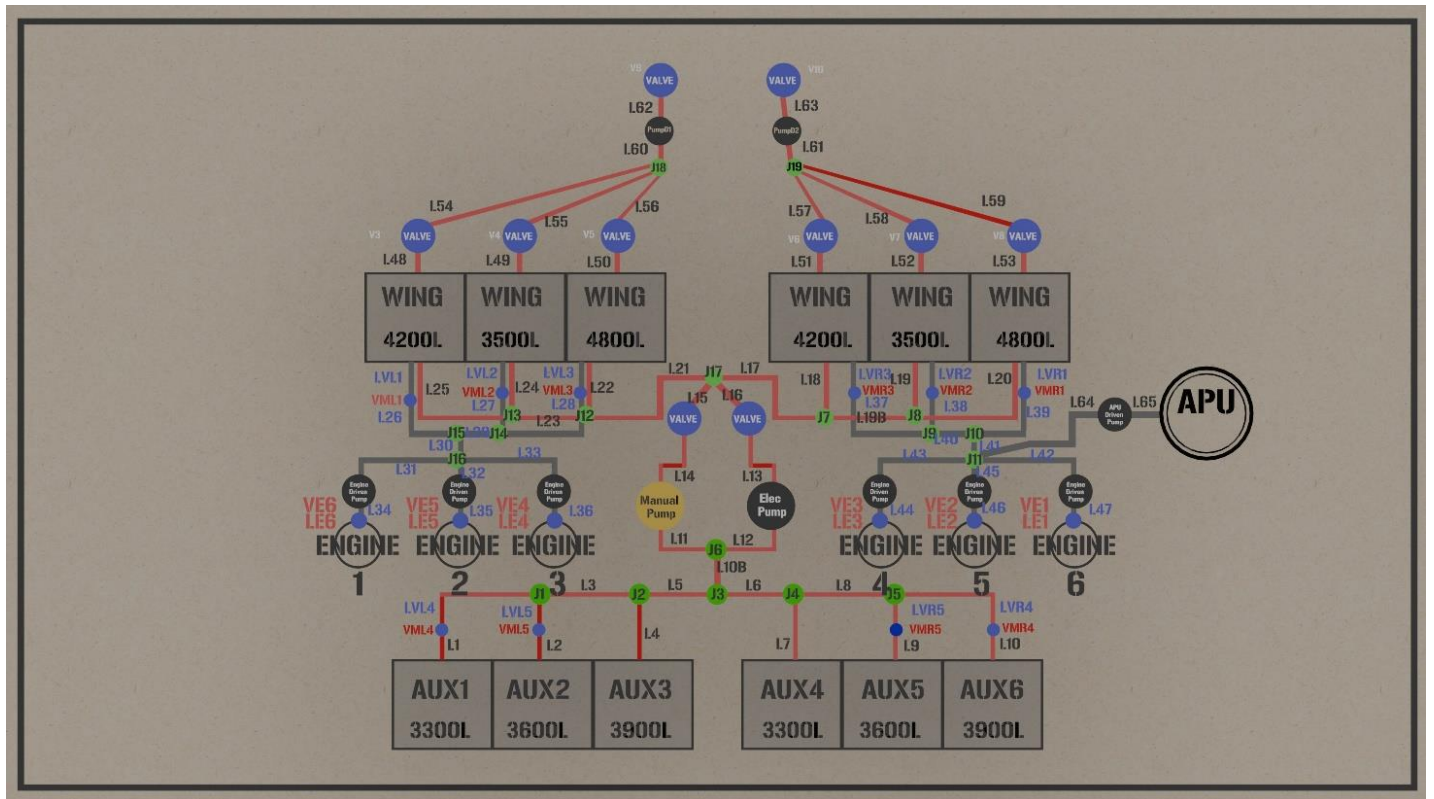
Each wing compartment is fitted with an air valve and a fuel drain valve. The air intakes are located in the aileron slot, while the exhaust is collected in two manifolds that emerge under the hull aft of the 1st step, via a telescopic sleeve. Compressed air is used to open the valves and discharge the sleeve. The control valves are located on the side facings of the engineer's station. A safety valve on each side protects the controls against inadvertent operation. This is the valve that controls the telescopic handle extension under the hull.

Fuel system:

Each engine has a 300L oil tank

Each wing comprises 3 fuel tanks: 4200 L, 3500 L and 4800 L + 6 auxiliary tanks in the hull of 3300 L, 3600 L and 3900 L, forward and aft..





Autopilot:



Using the Autopilot:

- Confirm that the gyropilot is active; set to "Marche" **no 1**
- Then set the master autopilot to on, **no 4**
- To maintain a heading, confirm that the aircraft is correctly placed onto the desired heading and confirm that the heading lock indicator (**no 3**) shows this heading, then switch (**no 6**) to to the closed position ("Fermé").
- To maintain an altitude, ensure that the aircraft is already at the desired altitude, then set the hold altitude switch (**no 5**) to closed "Fermé."
- (**No 2**) speed indicators were used on some variants to maintain a desired speed; this version does not use this function.

Specifications:

Main dimensions:

Wing span.....	57 m. 430
Length.....	43 m. 460
Height.....	10 m. 350

Wing:

Wing surface.....	350 m2
Ailerons surface.....	33 m2. 600
Flaps surface.....	28 m2. 175

Rudder and elevator:

Elevators surface.....	63 m2. 45
Rudders surface.....	27 m2. 50

Hull:

Length.....	43 m. 460
Max width.....	4 m. 200
Max height.....	5 m. 660
Max draft.....	1 m. 440
Damping angle.....	136°

Floats:

Capacity.....	5 m3. 680
Spacing.....	26 m. 200 axis
to axis	
Max width.....	1 m. 440
Max height.....	1 m. 040

Engines:

6 engines – Manufacturer: Wright
 Type: Cyclone GR 2600 A5B
 Power from ground level to 1500m:
 1369 hp at 2300 rpm
 Takeoff Power:
 1622 hp at 2400 rpm
 Power from 2000 to 3500 m
 1296 hp at 2300 rpm
 Gear reduction: 9 /16

APU / Centrale de bord:

Manufacturer : LATECOERE

Engine : SIMCA 8 Radiateur Chausson

3 vacuum pump

1 compressor

1 hydraulic pump

3 generator with fan

Climb speed (1322 hp):

73 000 kg..... 1.52 m/sec.

45 000 kg..... 4.10 m/sec.

Take off climb speed (1622 hp):

73 000 kg..... 2.85 m/sec.

45 000 kg..... 5.4 m/sec.

Take off speed (Flaps 17°):

73 000 kg..... 158 kmh

Landing speed (Flaps 17 °):

45 000 kg..... 140 kmh