BUGATTI EB100P

RED WING

FLIGHT MANUAL
EN 1.0.0 E

Microsoft Flight Simulator

LICENSE AGREEMENT:

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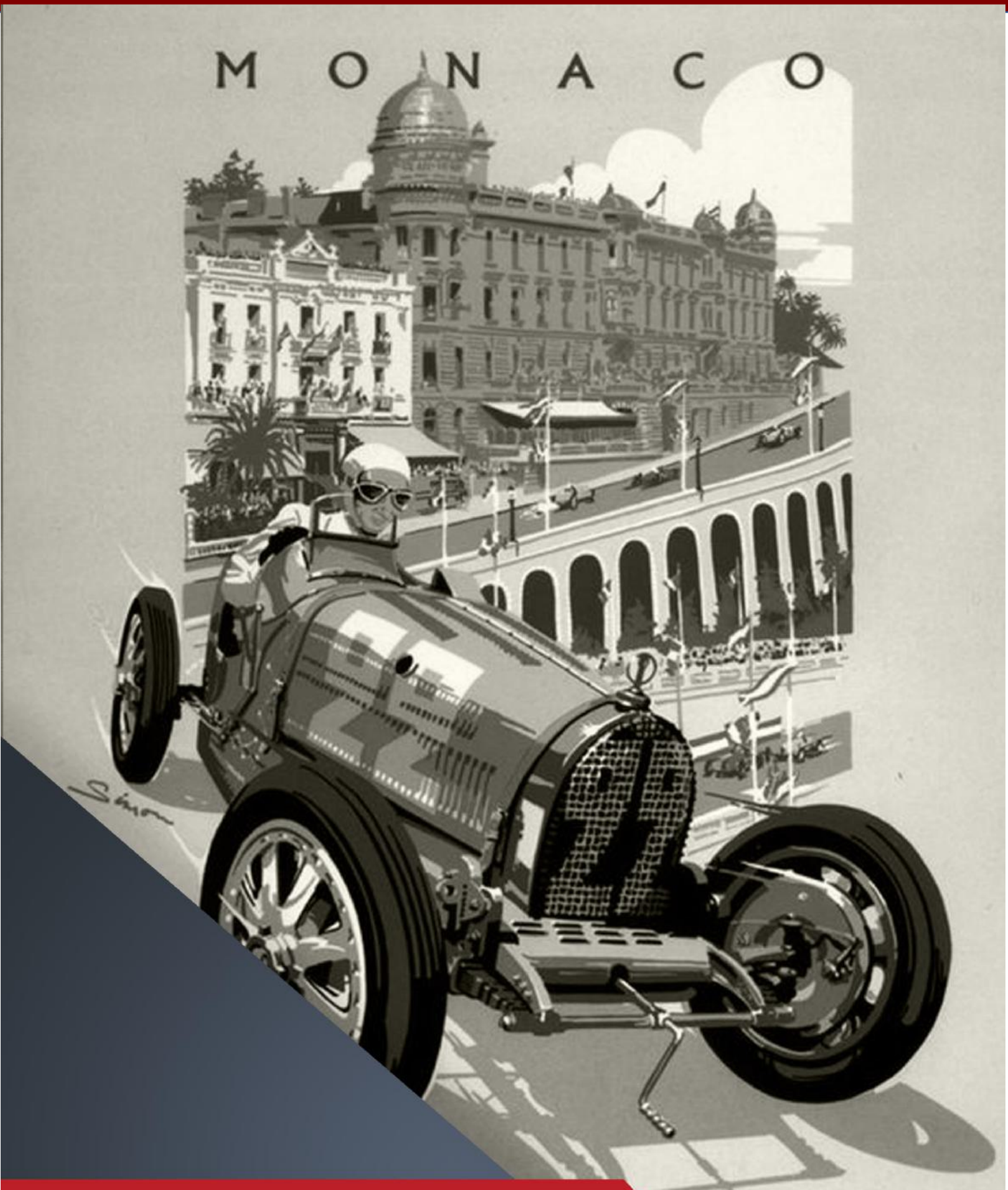


HISTORY

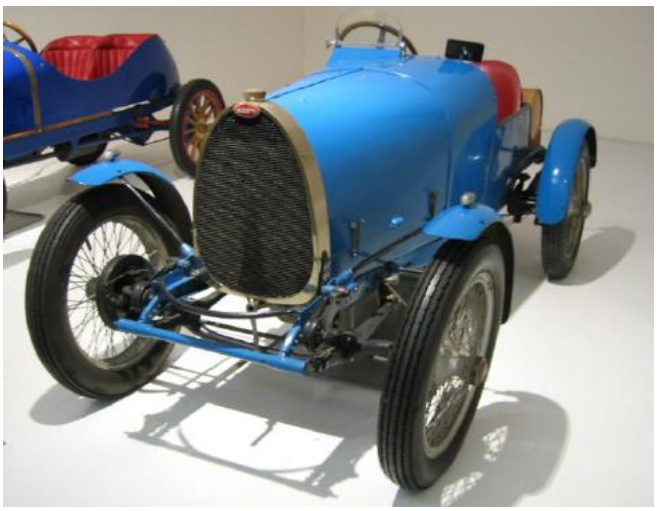
1.HISTORY

1.1 ETTORE BUGATTI

"Nothing is too good, nothing is too expensive"

Ettore Bugatti, an Italian born in Milan in 1881, is considered one of the pioneers of the luxury and competition automobile. He was an Italian industrialist and inventor who became a French citizen shortly before his death in 1947.

During his life he designed and patented more than 1000 inventions ranging including aluminum rim, unbreakable windshield, folding seats, the hand razor and numerous surgical instruments.

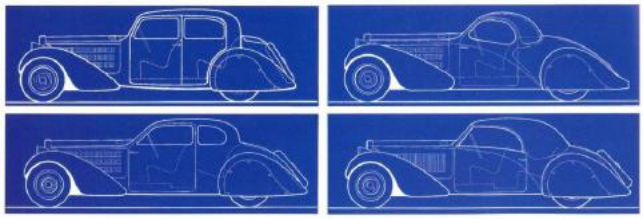


He designed aircraft engines of 16 cylinders in 2 rows of eight, for manufacture in the USA under license.

Aesthetic research was present at all levels of manufacturing and Bugatti even created his own tools. He wanted his car engines to be beautiful, even though they were hidden under a hood.

In 1931, in the dark years following the crisis of 1929, Ettore Bugatti saved his factory from bankruptcy by manufacturing 80 railcars, based on Bugatti Royale Type 41 engines of 12.7 litters, which he coupled four together to set a record speed of 192 km/h in 1934.

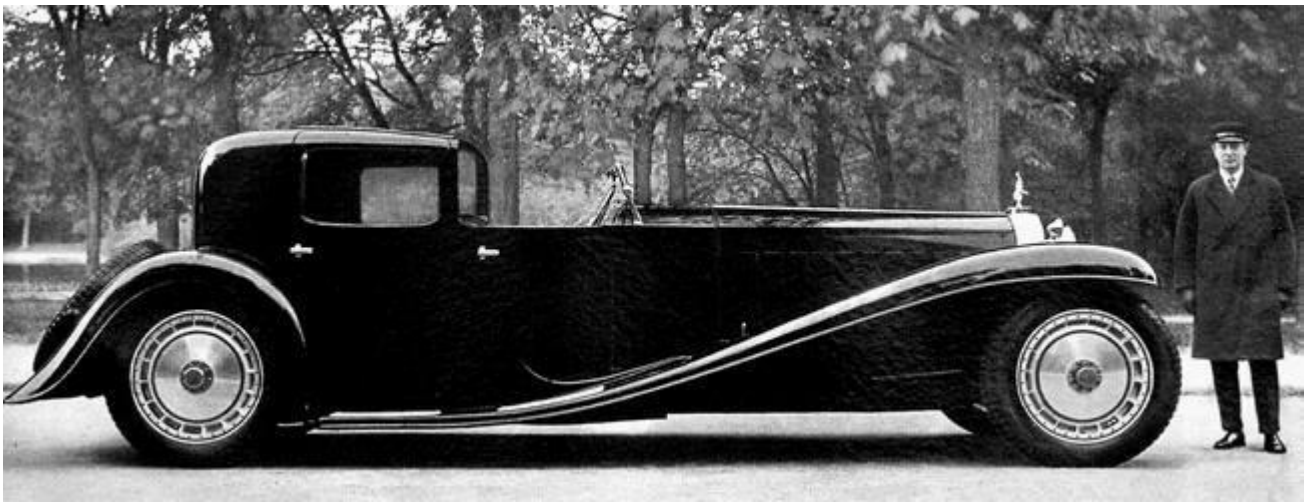
In 1934, the Bugatti Type 57, one of the most luxurious cars of the 1930s, was produced 700 cars with different aesthetic variants.



From 1939 to 1945, during the Second World War, the factory "was confiscated" by the Germans, and then disappeared. In 1945, Ettore Bugatti fought for the return of his factory in Molsheim, which had been seized by the French administration after the Liberation.

He won the case and tried to restart the factory despite mounting debt and lack of funds.

On August 21, 1947, at the age of 65, Ettore Bugatti died of exhaustion.

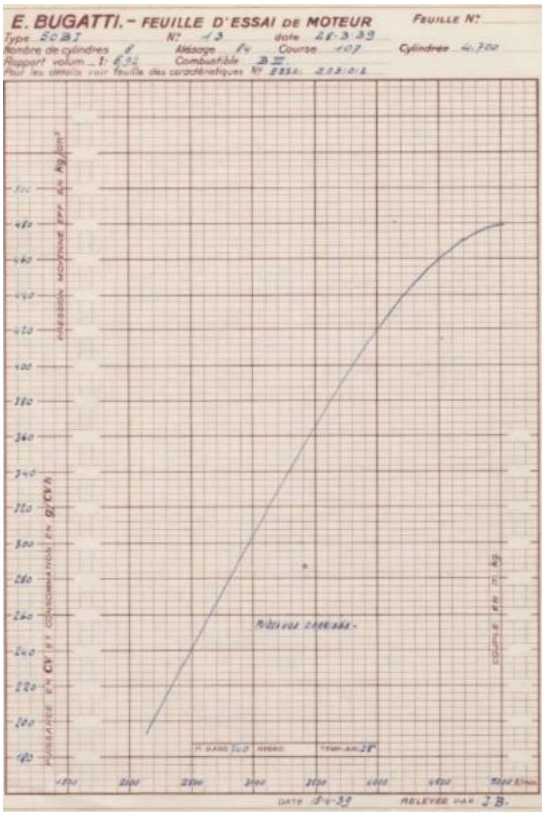


Bugatti "ROYALE" coupé "NAPOLEON"

1.2 EB100 P HISTORY

Ettore Bugatti's fascination with speed remained unbroken, despite the unfortunate fates of several of his friends. When, in 1937, ten years after Charles Lindbergh had crossed the Atlantic Ocean from New York to Paris, the French Ministry of Aeronautics asked him to develop a modern airplane for an air race. Bugatti gladly accepted the challenge and he set out to design and build a sleek elegant plane to eclipse the air speed record.
The new machine had to be light and very fast.

The first tests with two counter-rotating propellers, driven by two engines placed one behind the other, were very promising. Bugatti wanted to break the speed record of 709 km/h with his Type 100 P aircraft.



The French army was enthusiastic about the idea of a powerful aircraft and even offered a bonus as a reward if the record was broken.

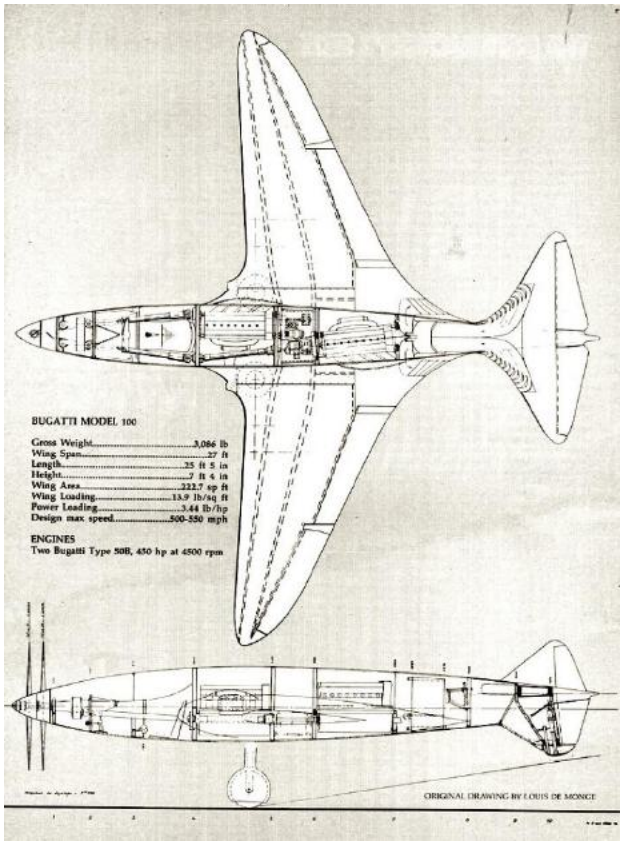
The French Air Force would thus have a more advanced aircraft than the German Air Force. However, the outbreak of the Second World War put an end to the construction of the Bugatti aircraft.

This plane was designed in 1937, and built to participate in the "Coupe Deutsch de la Meurthe" in 1938, against Max Holste (future designer, among others, of the Broussard) and Nicolas Roland Payen on Payen Pa-100, and to try to break the world speed record.

Ettore Bugatti asked the Belgian-born engineer Pierre Louis de Monge to design it.
The development and construction of the twin-engine Bugatti 100P racing plane with each of the two engines containing a displacement of more than 8 liters began at the Bugatti factory in Paris, 15, rue du Débarcadère.

The test pilot was Maurice Arnoux.

At the same time, a version for the speed record, with shortened wings, was to be built



In 1938, "Le Patron" obtained 6,900,000 francs from the French Air Ministry for two aircraft, the Type 100P, intended for the Deutsch de la Meurthe Cup (100 km closed circuit record), and a Type 110P (second reduced wing aircraft), intended to break the world record for pure speed.

At the end of 1939, A military version, the 110P fighter, was requested by the French Air Ministry. The planned armament is a 37 mm gun in the propeller axis and 3 machine guns in each wing. The order concerns 2 planes, 2 spare engines, and 1 complete transmission mechanism.

Unfortunately, in June 1940, the Bugatti factory withdrew to Bordeaux. The Germans were at the gates of Paris.
The plane was dismantled and transferred to the Château d'Ermenonville, owned by the Bugatti family. It never flew again.

After the war, the plane was eventually bought by an American who wanted the engines, mainly for use in auto racing. The rest of the plane is currently on display at the EAA AirVenture Museum in Oshkosh, Wisconsin.

A modern replica, as faithful as possible in both form and spirit, after years of research, effort and hours of work, took off on August 19, 2015 in Tulsa, Oklahoma.

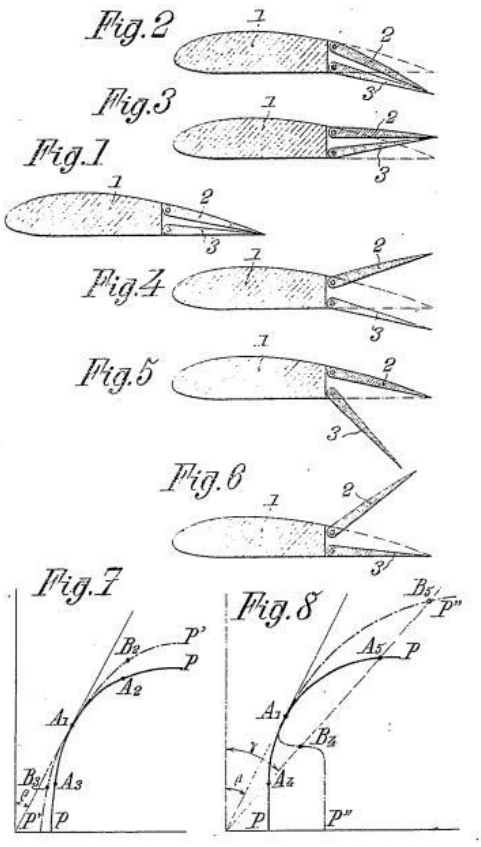
This aircraft unfortunately crashed on its 3rd test flight on August 6, 2016 in Burns Flat, Oklahoma.

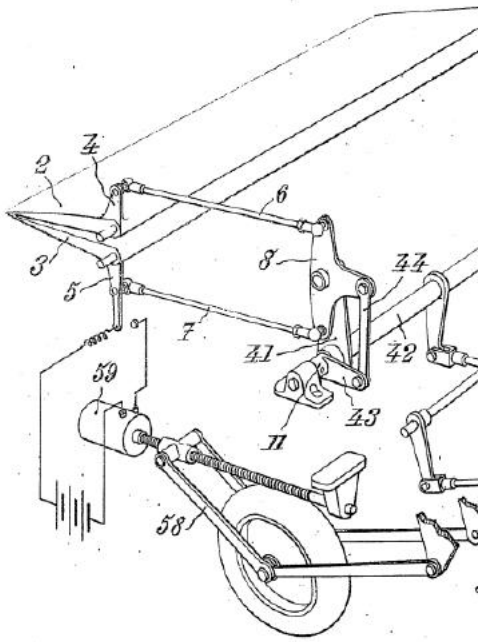
The pilot, Scotty Wilson, was killed in the crash. A version with his Livery will honor him and his contribution to the Bugatti pursuit legacy of speed and beauty.

1.3. The innovations

The aircraft had many innovative features:

- A Y-tail to allow a safe ejection of the canopy and the pilot.
- Two counter-rotating propellers powered by two Bugatti engines to avoid torque effects.
- A pneumatic rather than hydraulic system to power the main elements of the aircraft.
- A landing gear with automatic deployment.
- An automatic flap and airbrake "crocodile" system.
- A 37 mm barrel - cannon in the axis of the engine
- The air inlets for the cooling of the radiators are made by the Y-shaped inlet.
- The heated air is expelled into the leakage edges of the wings to avoid turbulence.
- Auto mixture control
- Wood with sandwiched layers of balsa and hardwoods, including tulipwood stringers covered with doped fabric.





GENERAL INFORMATION

2. GENERAL INFORMATION

2.1. SPECIFICATIONS

Low wing aircraft

Engines: 2

Seats: 1

Maximum Speed: 500-plus mph (as designed)

2.2. DIMENSIONS

Length: 7.7 m (22 ft 97 in)

Wingspan: POWER

Height: 2.25 m (6 ft 56 in)

Propellers: 2-bladed fixed pitch conter-rotating propellers

2.3. WEIGHT

Empty weight: 1.250 kg (2.755 lbs)

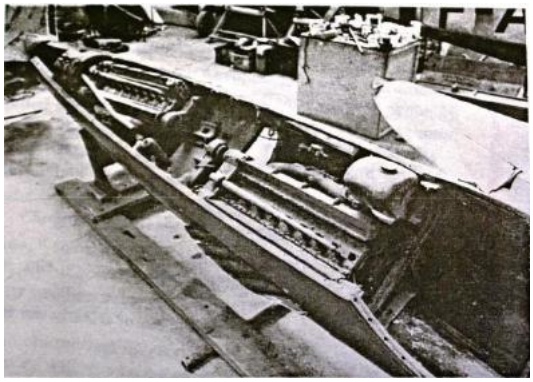
Useful load: 300 kg (661 lbs)

Gross weight: 1.550 kg (3.417 lbs)

2.4. ENGINE

2 - 8 cylinder in-line engines with liquid cooling each with a displacement of 4700 cm3 producing 450 to 500hp at 4500rpm according to the versions.

Made of aluminum and equipped with a dry magnesium crankcase to reduce as much weight as possible hiel retaining enough strength needed for the power produced. Unfortunately, magnesium was susceptible to fire which added to the danger of this type of design pushing the limits of the engines and aerodynamics of the plane. The engines were a true work of art which lived up to Bugatti's desire to achieve aesthetics on everything he was involved in.



Power plant:	Two Bugatti Type 50B inverted
Horsepower:	450 hp
Cylinders:	8-cyl in line
Year:	1937
Power:	500hp at 4500 rpm
Cooling system:	Water with radiators

2.5. EQUIPMENT

The Bugatti 100 P was never really completed.
All the equipment is therefore extrapolations from other aircraft of the same period.

The initial version of the aircraft was designed to break records, so the essential flight equipment of the time was reduced to its strict minimum.

It is obvious that in 1939, a plane had to have a radio and some navigation elements.

We have therefore provided a VHF radio and an ADF system as an option selectable on the Clipboard.

On the other hand, the apparatus will not have external equipment like navigation lights or landing lights.

2.6. WEAPON – MILITARY VERSION

All the military equipment is only speculation based on needs at that time and conjecture.

We can imagine that the French army would have replaced the two Bugatti engines by a standard hispano suiza engine (two three-bladed propellers), used on a large part of its aircraft fleet.
The canopy area would have been redesigned to allow a simplified view of enemy planes (possibly a bubble canopy and higher seat for pilot) or a simplified use and the efficiency of a gunsight.

In order not to distort the aircraft too much, we will use the standard version to equip it militarily.

Here is the military equipment installed by default:

- 2 freq. VHF RADIO
- 1 ADF display and loop motorized antenna.
- 1 O^2 system
- 1 red/white inside cockpit system

- 1 20 mm main cannon crossing the axis of the propeller.

- 2 7.5 mm secondary weapons under wings

- 1 Optional droppable ventral fuel tank

- 1 visor and 1 modified center panel

Main canon: The end of the barrel tube passes through the gearbox driving the propellers and emerges in the center of the propeller's conical shroud (the "spinner").
This arrangement (called motor-gun) makes it easier for the pilot to point.

HISPANO-SUIZA HS404 20mm 43 kg/ 95lb 60 shells for 600 strokes per minute 8.1 kg/ 17,8lb
Incendiary explosive shell 20 × 110 mm

Secondary weapons: a machine gun mounted in a pod under each wing

MAC 1934 M39 Machine gun 7.5mm 10.7Kg/24lb 350 shells in belt for 1200 strokes per minute 14 kg/31lb

Pneumatic shooting controls/actuations.

PERFORMANCE

3. PERFORMANCE

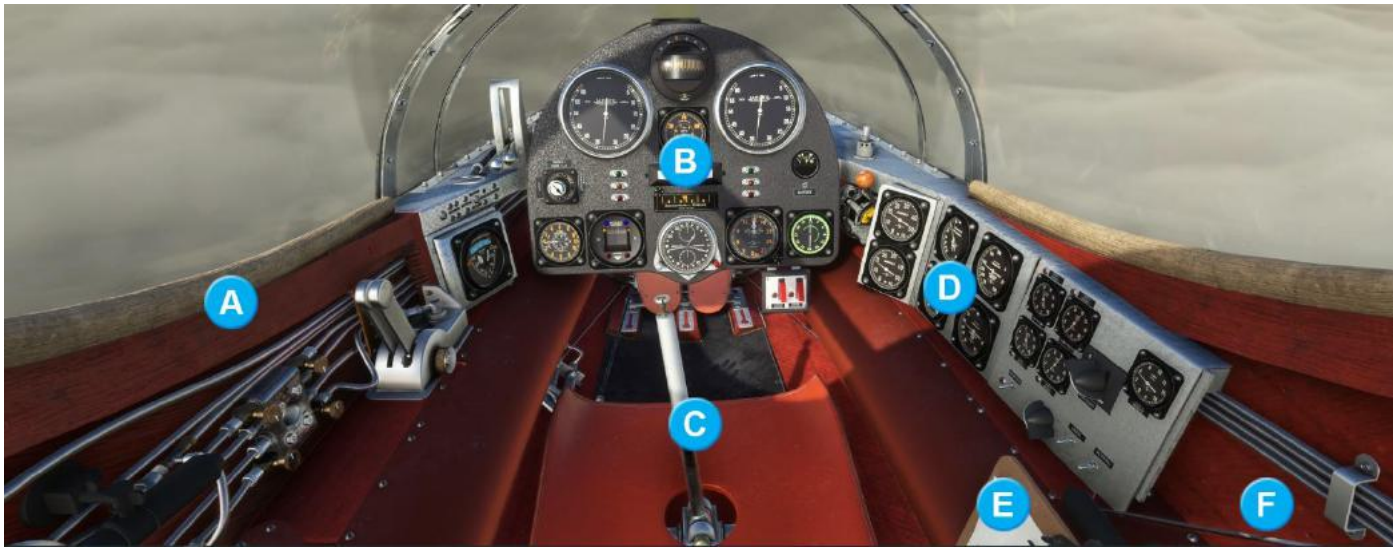
3.1 NORMAL PROCEDURES - SPEED

Take-off speed:	82 kts / 151 km/h
Climb speed:	139 kts / 257 km/h
Cruise speed:	280 kts / 518 km/h
Full Flap stall speed	60 kts / 111 km/h
Flap up stall	80 kts / 148 km/h
Max flaps extended	130 kts / 240 km/h
Max gear extended	152 kts / 281 km/h
Max. speed:	360 kts / 666 km/h at sea level
Ceiling	21.100 ft / 6430 m
Average autonomy	2 hours /559nm

PANEL GUIDE

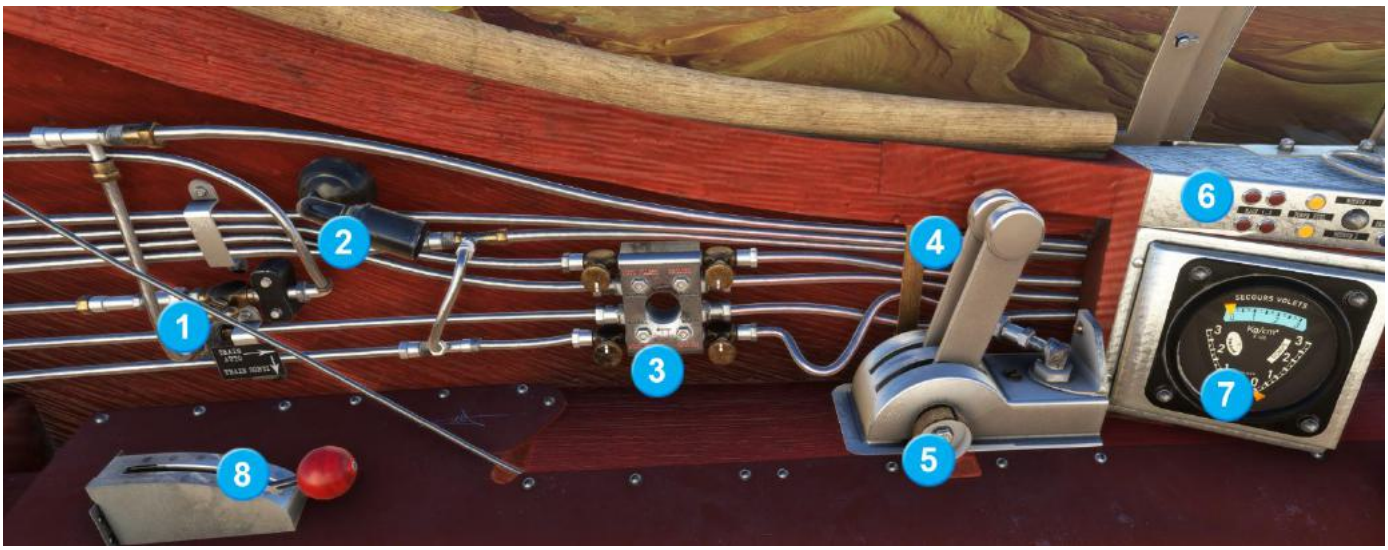
4. PANEL GUIDE

4.1 MAIN PANEL



A. INSTRUMENT PANEL LEFT
B. CENTER PANEL AND OVERHEAD
C. CONTROLS
D. INSTRUMENT PANEL RIGHT
E. CLIPBOARD
F. RADIO AREA

4.1.1. INSTRUMENT PANEL LEFT

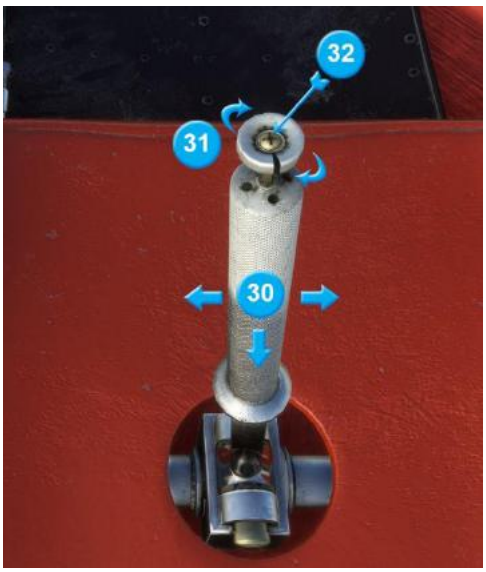


1. Gear auto/down valve
2. Adjustable left spotlight
3. Air distribution circuit normal/emer.
4. Throttle engine left/right
5. Elevator trim.
6. Easy mode help lights
7. Pneumatic indicator display
8. External tank jettison control (if available)

4.1.2. CENTER PANEL AND OVERHEAD

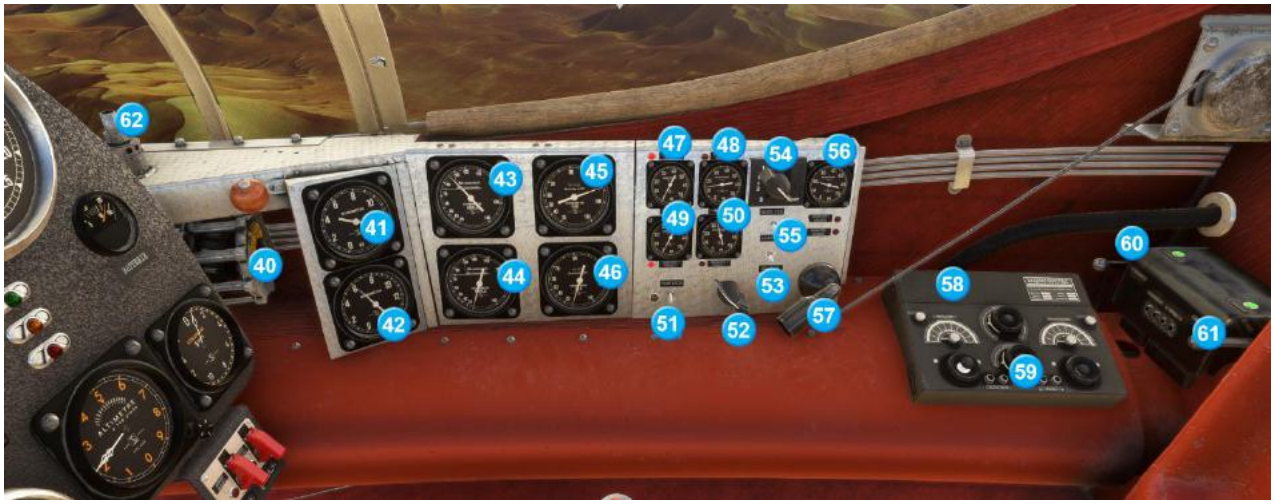
10. Open/eject canopy
11. Parking brake lever
12. Airbrake lever
13. Flaps lever
14. Vertical speed display
15. Gear position display
16. RPM indicator
17. Compass
18. Tachometer
19. RPM light indicator
20. Chronometer / clock
21. Altimeter
22. ADF/G meter
23. Voltmeter
24. Weapon selector (MIL. Version)
25. Starter ENG1 &2
26. Parking brake system
27. Rudder pedals and brake

4.1.3. YOKE CONTROLS



30. Yoke standard
31. Rudder trim
32. Press fire button (MIL. Version)

4.1.4. INSTRUMENT PANEL RIGHT



40. Pneumatic hand pump
41. Manifold ENG. left
42. Manifold ENG. right
43. Oil temp. ENG. left
44. Oil temp. ENG. right
45. Water temp. ENG. left
46. Water temp. ENG. right
47. Tank 1 Quantity
48. Tank 2 Quantity
49. Tank3 Quantity
50. Tank4 Quantity
51. Oil cooler switch
52. Knob light instrument panel
53. Switch light cockpit
54. Tank 5 to tank 1 2 1+2 selector
55. Switch red / white cockpit light (MIL. Version)
56. Tank 5 and external tank Quantity
57. Adjustable right spotlight
58. ADF panel (if installed)
59. VHF panel main and second. Freq. (inf installed)
60. Radio (avionics) switch
61. Battery master switch
62. Filling valve pneumatic system (ground services)

4.1.4. CLIPBOARD -PAGE 01 - MENU

The clipboard is stored/stowed on the right side of the pilot.

Just click on the metal clip to take it out or put it away again.

Two positions are available:
A: in front of the pilot on his right side

B: To the left of the pilot on his lap

Services: Requests or cancels ground services.
The pilot exits the aircraft, and the engine covers are removed.
Services are inhibited as soon as one engine is switched on.

Chocks: Request or cancel the installation of wheel chocks.
The chocks are deactivated if the plane is moving forward.

Auto pilot: There was no autopilot on this aircraft, none less we installed a hands-free system to hold the wings flat, maintain a heading and altitude at which it was switched on.
As the throttle is not managed by this system, the altitude can still vary due to wind up or down drafts.

Flight Easy- Normal – Realistic: three flight levels for three skill levels
Easy mode:

- no fuel consumption
- no engine or pneumatic system failure
- Display of flight assistance lights.

A light on indicates a problem with the start-up.

Oil 1&2 and water 1&2 Warning light.

Radio and battery status light

ADF frequency capture indicator light

Normal mode:

- No help/assistance lights
- Engine and pneumatic system failure can occur
- Normal fuel flow

Realistic mode/ career mode (Not available in this version)

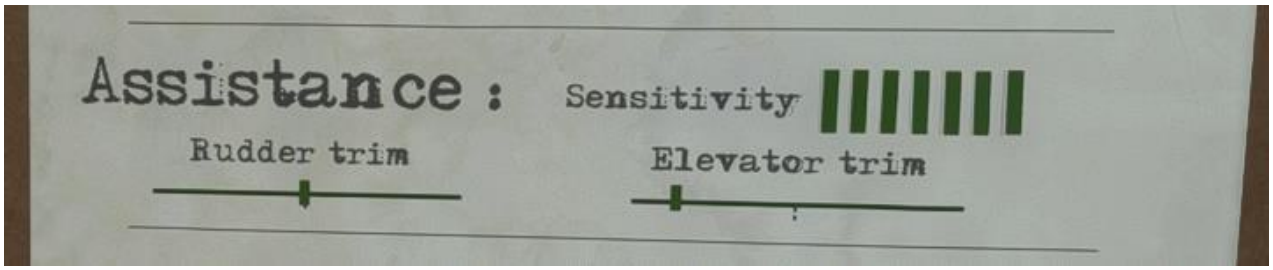
- Specific missions for each EB100 version
- Air Race timing clipboard page
- No "ready to fly" available

STATUS Cold start - Ready to fly : two pre-set status options for your aircraft

Cold start: The aircraft is at a complete stop, all systems are shut down, ground services and chocks are in place.
This status can of course only be selected on the ground via a clipboard option.

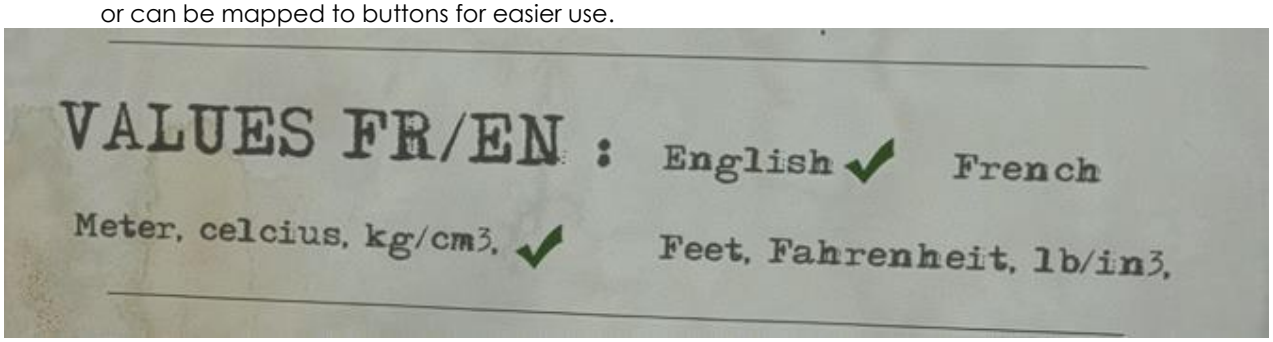
Ready to fly: Engines are started, all essential systems are switched on and adjusted, aircraft is ready for take-off – flaps 33%.
This status can be used in flight to reset the flight parameters or restart the engines. It cannot be used in career mode.

Visibility: Hide or show pilot, yoke or outside visual effects



Assistance:

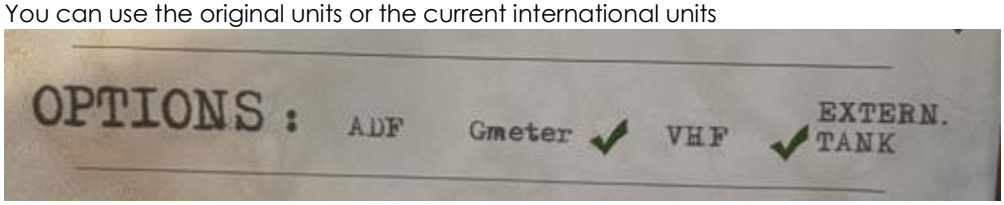
Sensitivity: Some joysticks or equipment require more or less sensitivity for trimming
Rudder and elevator trim: can be managed here by pressing on left and right of the adjustment bar or can be mapped to buttons for easier use.



Value:

FR /EN: All the information was written in French but you can localize them in English if you prefer

METER/FEET …etc: In 1939 the units were not yet standardized.
You can use the original units or the current international units



Options: Some equipment are installed by default, others are optional but add weight to the aircraft.
If the ADF indicator is not installed/selected, the Gmeter will default and overlay the ADF indicator on the pilot panel.

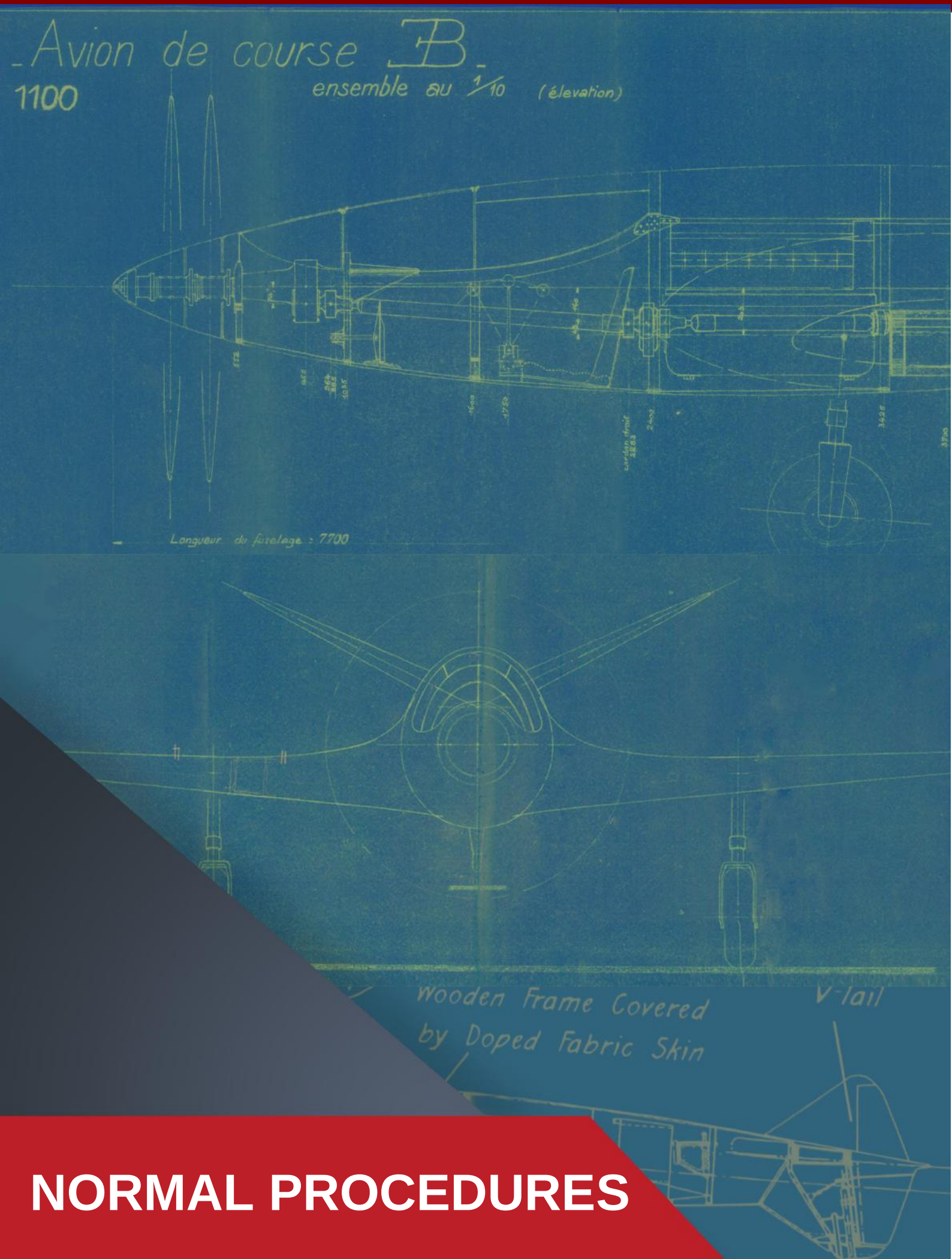
External tank is only available on some versions.

Fuel: on ground, you can manage fuel quantity by simply press pre-config

Ream: the rearmament of the gun is possible only on the ground and for the military versions of BUGATI 100P

Checklist: access to the normal and emergency on dedicated page.

Checklists are available in English and French



NORMAL PROCEDURES

5. NORMAL PROCEDURES

5.1. TAKE-OFF

Before take-off, the pilot needs to validate essential elements:

- All controls are free to move and not blocked
- The Flettner (elevator trim) is in neutral position (USER can adjust for takeoff +5-7 deg)
- Oil pressure and water temperatures are ok on engine 1 and 2

Pilot sets the throttles (left & right) to 50% and release the parking brake, then wait for tail raise above 40kts.

There should be no effect with the two contra-rotary motors if the rudder is centered

When speed increase to 55-60 knots, pilot should pull back the yoke slightly to climb slowly.

Above 150 feet, vertical speed by trimming nose down to reduce pitch and increase aircraft speed above 75 knots.
After checking a positive vertical speed, pilot raise flaps to 0% position . Gear is auto raised up.

Target cruise speed is 250-280 knots depending on weight.

A slightly higher Cockpit view (hit spacebar) is desirable in most flying situations to get a better view.

On ground, do not taxi to high speed, a braking action could create a ground loop and/or damage propellers

5.2. Cruise

Power should not exceed 6000 RPM in nominal flight.

Above 300 kts, elevators are less effective and a ground effect could occurs at low altitude

5.3. Descent and Landing

Use airbrakes to break the aircraft speed under 200kts
Use flaps to reduce to approach speed under 150kts and final speed under 100 kts (inner airspeed display)
At full flaps gear is auto down.

Full Flap stall speed	60 kts / 111 km/h
Flap up stall	80 kts / 148 km/h
Max flaps extended	130 kts / 240 km/h
Max gear extended	152 kts / 281 km/h

Land slightly tilted back to touch down with both wheels of the main gear or better yet a 3-point landing is more desired. **– Pro tip Landing with Airbrakes ON can add a little more lift to further reduce landing speed**

Reduce throttle as soon as possible, then pull back the stick once the speed is controlled to make the tail skid touch down and slow the aircraft.

When all gear are in compression (on the ground), braking action is assisted by auto airbrake.

Never push the stick forward which could cause a ground loop or "cheval de bois" in French.

TIPS FOR PILOTS

6. TIPS FOR PILOTS

6.1 Engine.

Mixture, oil & fuel valves or ignitor 1+2 are auto managed.

To cut an engine simply turn Engine starter to the desired engine then press the button (as a start/stop)

In case of idle position for a long time then a quick push of the throttle, the fuel accumulated in the pipes can induce a flame at the exit of the exhausts

6.2 During Taxiing

The limited visibility in the cockpit makes the ride complicated.

The pilots often used to lean their heads to the side and ride in zigzag pattern.

Throttle control is essential to keep speed reasonable for taxiing.

6.3 Air Race flight

Check with precision the centering of your device and take only the minimum fuel to stay light enough.

Keep an eye on the G-meter to avoid black or red veils. You will hear pilot panting or grunting when G pressure gets high.

Near ground at high speed expect a ground effect and a slight suction that the elevators cannot simply correct.

6.4 Variables persistency

Some variables are saved each time the game is closed or the plane is disabled by returning to the menu.

WORK IN PROGRESS

This documentation is for FLIGHT SIMULATOR GAME USE ONLY

INSTALL & SUPPORT

7. INSTALL AND SUPPORT

This product should be automatically installed to the right flight simulator scenery folder.

- "Official/OneStore" for Marketplace and Steam Buyer

ONLY USE THE MODERN FLIGHT MODEL IN GENERAL OPTIONS MENU

In case of trouble please contact us:

Discord **https://discord.com/invite/5uCtPUwX2E**
Email **contact@redwing-copter.com**

For updated information, Improvement efforts, fixes and optional installation advice, please check our website **https://redwing-copter.com/**

8. CREDITS

Authors: Bertrand DEMARE., Etienne CHATRY, Eliott BOISSENIN and all subcontractors .

We thank all helpers and beta-testers, Dkgolfnut-Dennis, Mirou, Elblounge, Easyraider, Dakota Pilot and TheSmoke14.

A special thanks to all our customers, helping us to create better products.

MORE INFO.

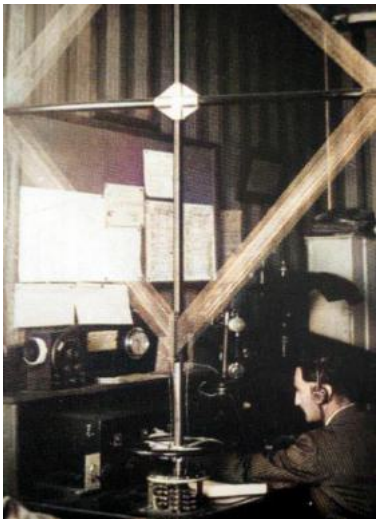
9. MORE DETAILED INFORMATION

The following pages will provide specific information about the following items:

ADF
Airbrakes
Airspeed indicator
Ailerons, rudders, and elevators and trims.
Altimeter and altitude
Clipboard
Direction, indicator compass
Electric system
Fuel system
Landing gear
Lights – external - internal
Magneto / ignition -starter
Oil engine system
Pneumatic system

ADF - AUTOMATIC DIRECTION FINDER

To gain directional navigation awareness (flight from a point to another by following the ground-based signals), fly above the clouds or at night, the pioneers of aviation have developed various techniques.
The navigation compass associated in addition to a stopwatch allowed to define routes with a wind drift calculation.



It was then quite often necessary to recalculate its position while flying to validate it is on course.

Visual beacons helped pilots for a time, but it was the advent of radio and the construction of ground transmitter/beacons that allowed a new way of navigating.
In the beginning, both ships and aircraft used radio transmitters.

The pilot would call a Gonio station on the ground and it would read the position of his call via Morse code initially and then by radio audio it would send back his bearing to the station.
Several bearings of nearby stations allowed to triangulate a precise position of the aircraft.

The navigators of the German Hindenburg with this empirical method, could bring their airship to less than three meters from the mooring mast without any visibility.

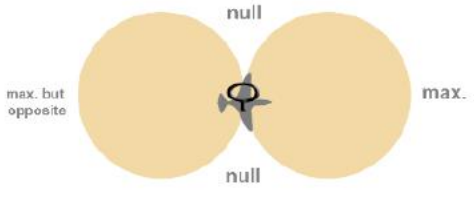
Then transmitters specifically installed for navigation “THE ADF” (Automatic Direction Finder) became widely used.

The NDB beacon is the oldest means of radio navigation since it was invented in 1920 by Fisher.
This non-directional radio transmitter, which broadcasts its signal in all directions and with the same power, is based on the principle of radio direction finding.

There are two types of transmitters:
- NDB often of great range of 100 to 200 Nm, it defines the airways. Its code is generally composed of three letters;
- Locator of reduced range between 15 and 30 Nm near an aerodrome it is used as an approach and landing aid. Its callsign is usually composed of two letters. Not to be confused with the ILS localizer;

The ADF signals follow the curvature of the earth. The maximum of distance is dependent on the power of the beacon station. The ADF radios can receive on both AM radio station and NDB (Non-Directional Beacon). Commercial AM radio stations broadcast on 540 to 1620 Khz. Non-Directional Beacon operate in the frequency band of 190 to 535 Khz. EB100 P is a loop rotating antenna. This system Is only directional and a 180° error could be encountered.
Accuracy: between 5 and 10°.

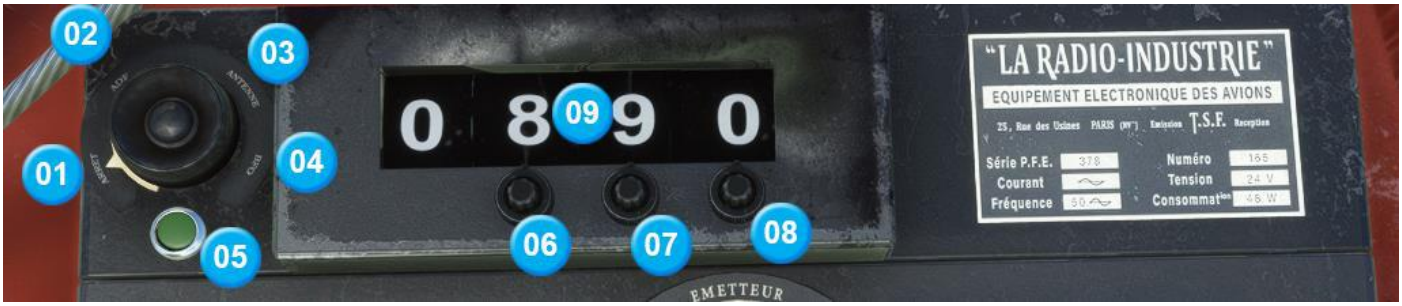
Sensitive to atmospheric disturbances (thunderstorms), coastal effects, night effects (ionized layers of the upper atmosphere)



GONIO RECEPTION - LOOP ANTENNA

The ADF frequencies in 1930 were much more limited but we have updated the devices to make them compatible in MSFS with the 2020s

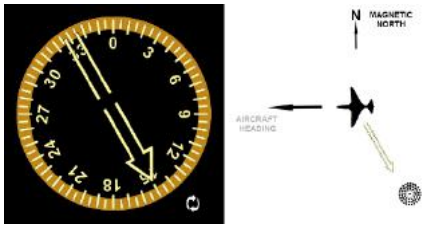
BATTERY and RADIO/AVIONICS must be turned on



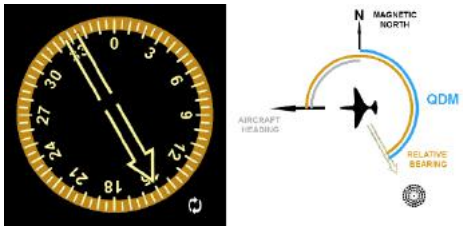
01- OFF position / ADF is not energized.
02- ADF / The ADF is operational
03- ANTENNE (ANTENNA) / ADf is on ident. Morse code of the station audible and ADF Fq
04- BFO / Only Morse code is audible
05- Lights up if an active ADF frequency is detected (only on easy mode)
06- Rotary knob for Mhz selection
07- Rotary knob for Khz selection
08- Rotary knob for Hz selection
09- ADF frequency display area

ADF USE

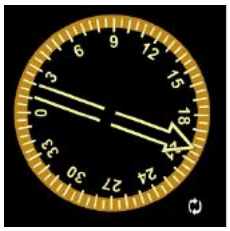
Display the frequency of the station you want to reach.
Switch to ANT or BFO to confirm station identification.
Switch back to ADF to view the direction of the station.
The ADF needle always indicates the geographical position of the station relative to the aircraft.

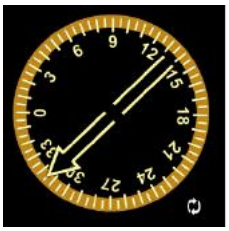


Turn the card selection knob if you don't want to do mathematical calculations.



Relative Bearing (QDM) = Magnetic bearing of station + magnetic heading (- 360 if over 360)





WIND MANAGEMENT

With wind, the pilot must change the bearing by turning to the side of the needle to head for the station. Keeping the course constant, which initially gives a zero bearing, he waits to see the trend of the needle. If the needle leaves the 0° bearing, it indicates the direction of the wind that is causing the deviation:

- If the ADF needle goes to the right, it means that the wind is coming from the right.

- If the needle of the ADF goes to the left, it means that the wind is coming from the left.

To reach the station on a constant heading without making the "dog curve", the pilot must counter the wind by taking a drift corrected heading. He must therefore set the ADF needle against the wind until he reaches the station.

If there is a deviation of the needle and the drift reaches 10°, instead of correcting the heading by 10° to cancel this drift, it is better to make a correction of 20°, i.e. double the value of this drift, then to hold this interception heading until the needle is pointing again towards the windless heading before reducing the correction by half, i.e. 10° of drift, to compensate for the wind, and then to refine this correction to the right value.

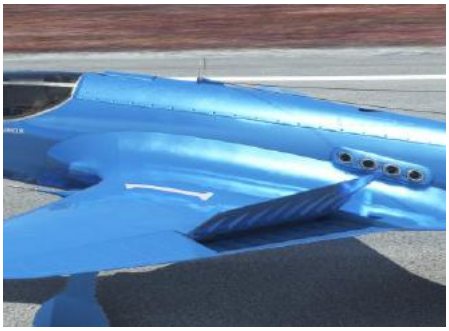
AIRBRAKE

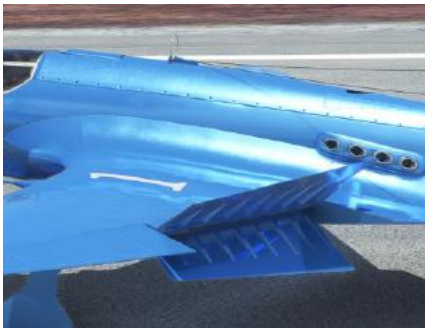
The speed of the device can be greatly reduced by using the airbrakes.

4 notches to adjust the dynamic braking power.

Together with the flaps in open position, the "crocodile" shape increases the capacity of the system.

Airbrakes are a mechanical cable system that does not require pneumatic pressure or electricity





Airbrakes are often used to break the speed of an aircraft during a steep turn, change the attitude of an aircraft in close combat or a short landing.

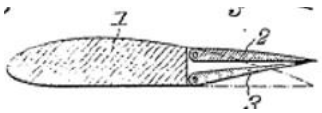
On the ground (all landing gear in compression), an automatic system extends the airbrakes as soon as the pilot brakes in order to keep the aircraft on the ground.

Manual control overrides the automatic system.

There is another automatic system to synchronize 5° up flap and airbrake at high speed.

This concept modifies the curvature of the wing to increase the efficiency of the flight controls.

This system is not yet implemented in this version.



AIRSPEED INDICATOR

Two needle displays the current speed of the unit.

The inner orange needle displaying speed from 0 to 100 kts is used for take-off and landing.

The outer white needle displaying speed from 100 to 400 kts is used for cruise flight. Display number is x10 for KTS.

The "Badin" system by anemometer gives the indicated speed (Vi) or read speed. This speed corresponds to the proper speed (Vp) or true speed at a pressure of 1013.25 hPa/29.92 inhg (at sea level in standard atmosphere) and at a temperature of 15°C/59°F.

As the density of the air decreases, i.e., as it rises, the proper velocity is greater than the indicated velocity (an approximation can be made by adding 1% per 600 feet above the 1013 hPa/29.92 inhg sea level).

True Atmospheric Pressure is not settable on early Air Speed Indicators like this Badin model. Therefor you need to calculate true altitude based on deviations from standard pressure manually.

All instruments can be read in French or English and with French or English values according to the selection on the clipboard menu page.

The Badin system was invented by Raoul Badin in 1911 to measure the speed of an aircraft in relation to the air in which it evolves and to fly in a controlled manner without visibility

This instrument became mandatory in 1923 on board civil transport aircraft. In the French-speaking aeronautical world, "Badin" has become synonymous with aircraft speed.

AILERONS RUDDERS ELEVATORS & TRIMS

Aileron, rudder, elevator and trims.

All surface controls are manually operated by cables depending on the physical force applied by the pilot to the control column and rudder.

During flight, trim adjustments on each axis must be made to maintain the aircraft in a stabilized flight configuration without maintaining pressure on the control column.

On the EB100P there was no native trim but for convenience we have created elevator and rudder trim to help stabilize the aircraft.

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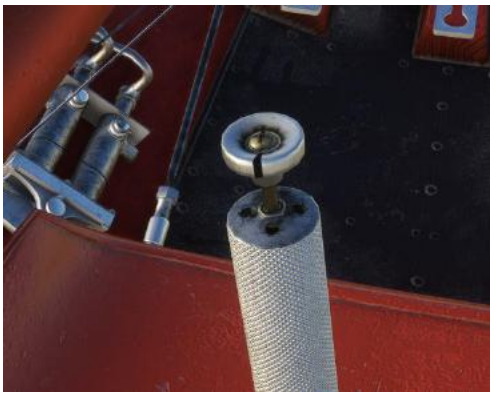
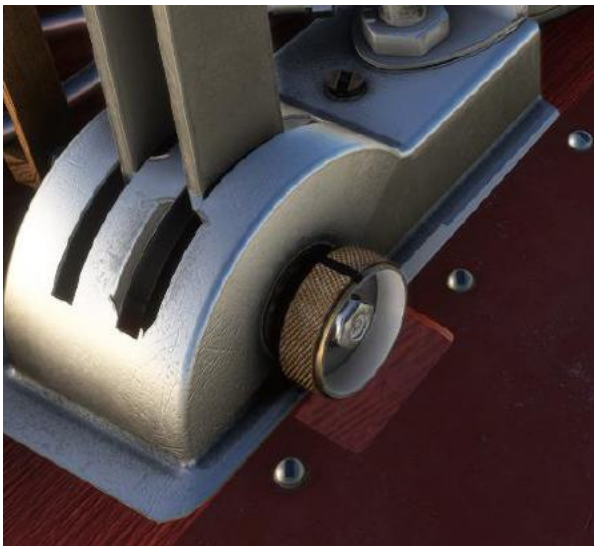




ELEVATOR TRIM is “HIDDEN” near throttle an mouse adjustments can happen here.

RUDDER TRIM is “HIDDEN” up on the yoke.

Mapping to buttons on your yoke can be easier to use if you prefer.

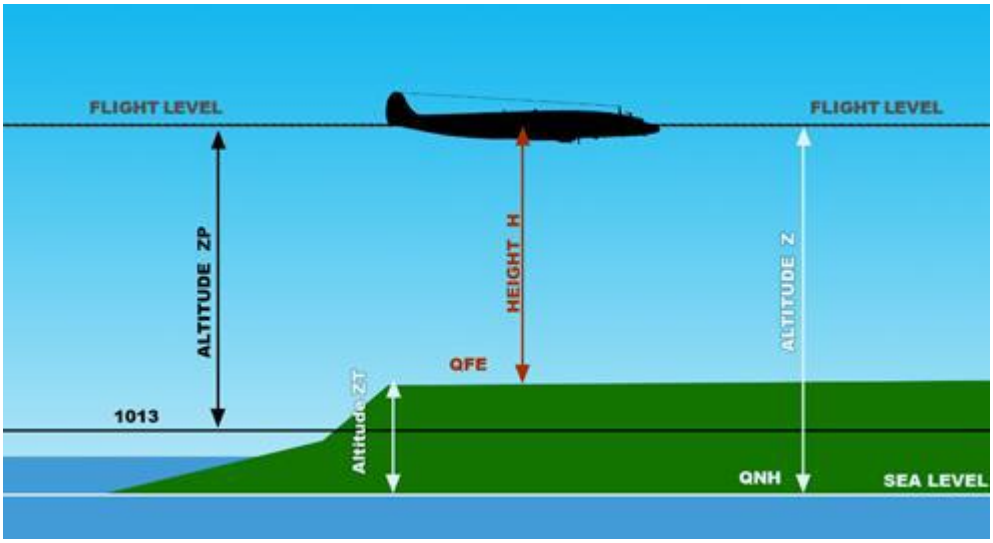
Robert Esnault-Pelterie invented the aileron (1905) by modifying a plane of his own construction designed after the Wright brothers' Flyer, then the joystick (1906) as well as the development of the star engine (1907).

Altimeter and altitude

The altimeter provides a pressure altitude.

This measurement is based on the decrease in atmospheric pressure as altitude increases.

The altimeter is actually a barometer graduated in altitudes set by a Knob to the left bottom.



QNH: This setting is displayed in the adjustment window and is relative altitude to sea level pressure
On the ground, an altimeter set to QNH indicates the topographic altitude ZT of the airfield.
In flight, an altimeter set to QNH indicates a current altitude based on QNH value. Note that the QNH setting is only valid for a given sector/area of about 100 to 150Km around the station that provided the most current QNH.

The altitudes indicated on the maps are in function of the QNH.

QFE: This setting is used for the take-off and landing phases; displaying the pressure prevailing at the current location/airfield in the window.
On the ground before take-off, by setting the pointer to zero with the adjustment knob, you can read the QFE in the window.
In flight, an altimeter set to QFE indicates a height (altitude/pressure) relative to the airfield concerned. The QFE can either be communicated by radio to the pilot or calculated from the local QNH and the altitude of the airfield. In case the QFE is transmitted by an air traffic service, the reference level is the official altitude of the aerodrome.

1013: This setting consists in displaying in the adjustment window the pressure that would prevail at sea level if the real atmosphere corresponded to the standard atmosphere.
This pressure is expressed in hectopascal. (i.e., 1013.25 hPa or 29.92 inhg)
This setting is used for air traffic because it is independent of any measured or calculated pressure. It allows a correct spacing in the vertical plane of all aircraft flying in the airspace.

Autopilot

This original aircraft was not equipped with an autopilot. However, we have integrated a hands-free system to help with longer flights.

The plane will maintain its course and altitude when the Auto Pilot is turned ON.

The auto pilot is located at the top of the main page of the Clipboard.

The AP can be disabled by clicking on the "HULA GIRL" card on the dash or by selecting OFF on the clipboard

Autopilot is not available on ground.

Canopy

The canopy can be locked and unlocked from the ground using the top handle.

Use this handle on the ground to open and close the canopy, or to eject it in flight.

The V-shaped tailplane is designed to allow the pilot to safely eject from the aircraft.

In reality the folding canopy was not mechanized and required the assistance of a ground technician. We simulate the canopy as if it were on slides for convenience.

Clipboard

SEE chapter 4.1.4 to 4.1.10 for all information's on Clipboard

Direction Indicator compass

Direction indicator indicates the magnetic heading of the aircraft according to the earth's magnetic field.

Electric system

Aircraft battery, avionic battery switches off and Amperemeter display

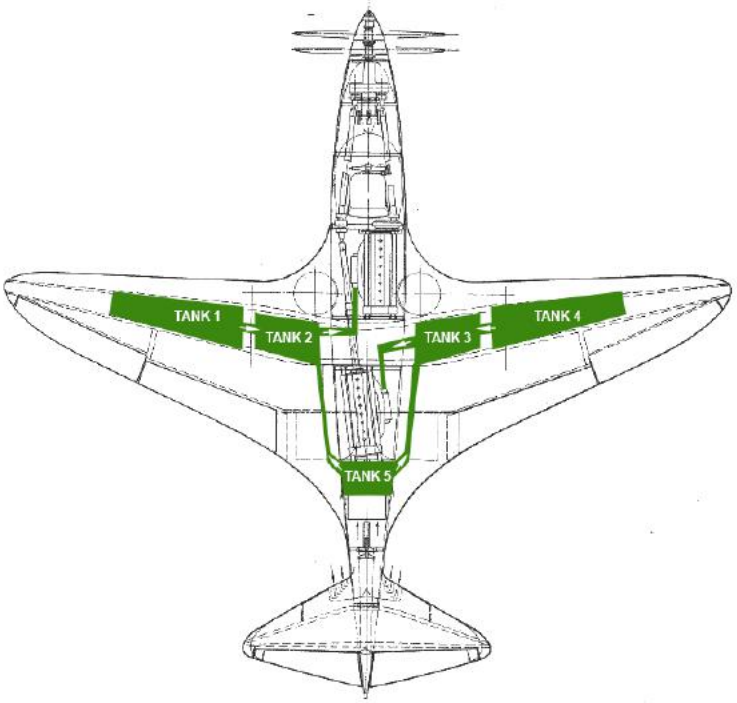
FUEL SYSTEM

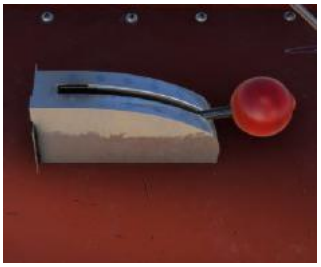
Fuel system is very basic on EB100P.

Tank 1 is linked to Tank 2 by gravity and vacuum pressure.

Tank 4 is linked to Tank 3 by gravity and vacuum pressure.

Tank 5 can feed ENG 1 or 2 or 1 and 2 via a knob selector.





External if available and installed is feeding tank 5. Quantity of tank5 and external tank are cumulated on same display.

External tank can be jettisoned via a right side red lever

LANDING GEAR

Ettore Bugatti filed patent no. 854-333 for the interconnected landing gear, flaps, and automatic airbrake system.

The landing system is powered by a pneumatic circuit (even if the initial patent talks about an electric motor).

By default, if the circuit is closed (valve pointing up and down) or in failure, the gear is extended.

On the other hand, if the air circuit is open (pointing in line with piping), then the gear is in automatic.

Lowering the flaps to the last notch automatically activates the landing gear by opening the circuit Closing them (flaps 0%) will raise the gear.

The main gear and the tail wheel are retractable to improve the aerodynamics of the aircraft.

LIGHTS – EXTERNAL - INTERNAL

There are no navigation or landing lights for racing aircraft.
The Military EB110 P version is equipped with a minimal navigation light system

The interior lighting is activated by a switch on the back of the right panel.

A two-position switch allows a white - red selection of the cockpit lighting (MIL. Version)

The lighting of the instruments is controlled by a rheostat knob (left side) to limit the reflections on the canopy.

The left and right spotlights are adjustable with the mouse.

MAGNETO – IGNITON – STARTER IGNITION

The starting system, like all systems on this aircraft, has been designed to be as simple as possible.

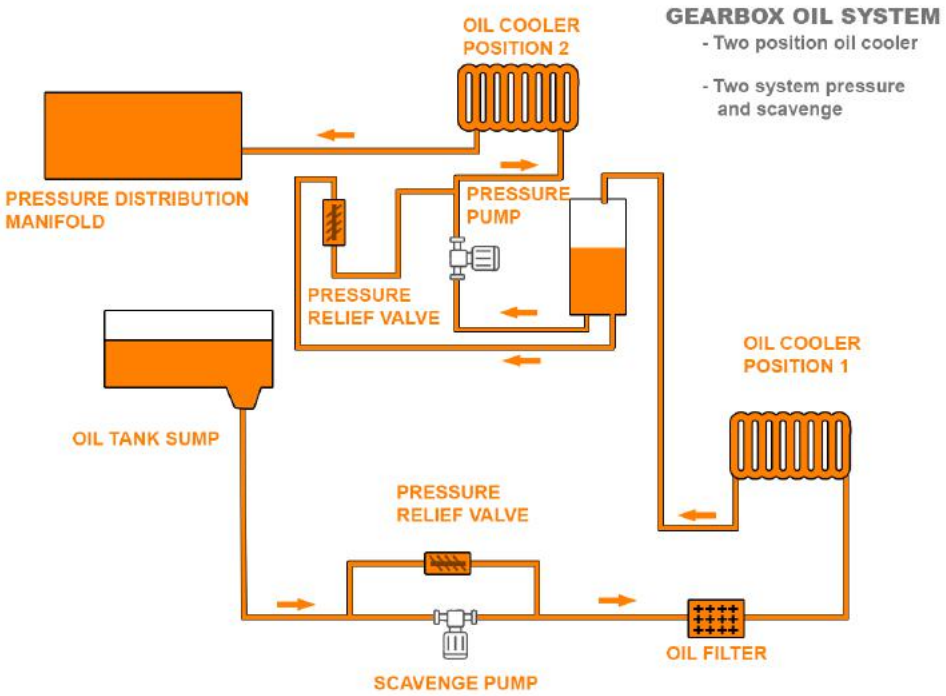
Just turn the starter one step and press to start engine 1 and turn a second step to start engine 2

The magnetos, oil and fuel valves are automatically managed.

To stop an engine, turn the knob on the desired position the pull it.

OIL ENGINE SYSTEM

The oil temperature is displayed by two indicators.
In case of overheating an external flap on the fuselage top behind canopy can be activated/raised to help cooling



OXYGEN SYSTEM

The portable oxygen system is only available in the Military version

The cylinder located on the right of the pilot behind his seat is easy to use.
A valve located before the mouthpiece allows the opening and closing of the O^2 delivery.
The mixture is indicated on the manometer

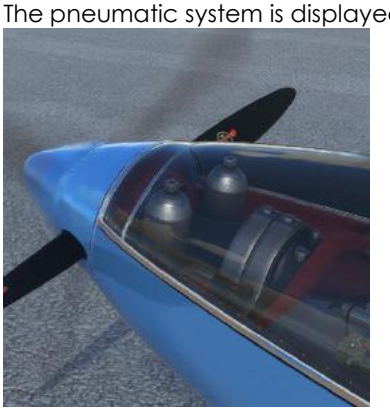
hypoxia is not yet simulated in MSFS

PNEUMATIC SYSTEM

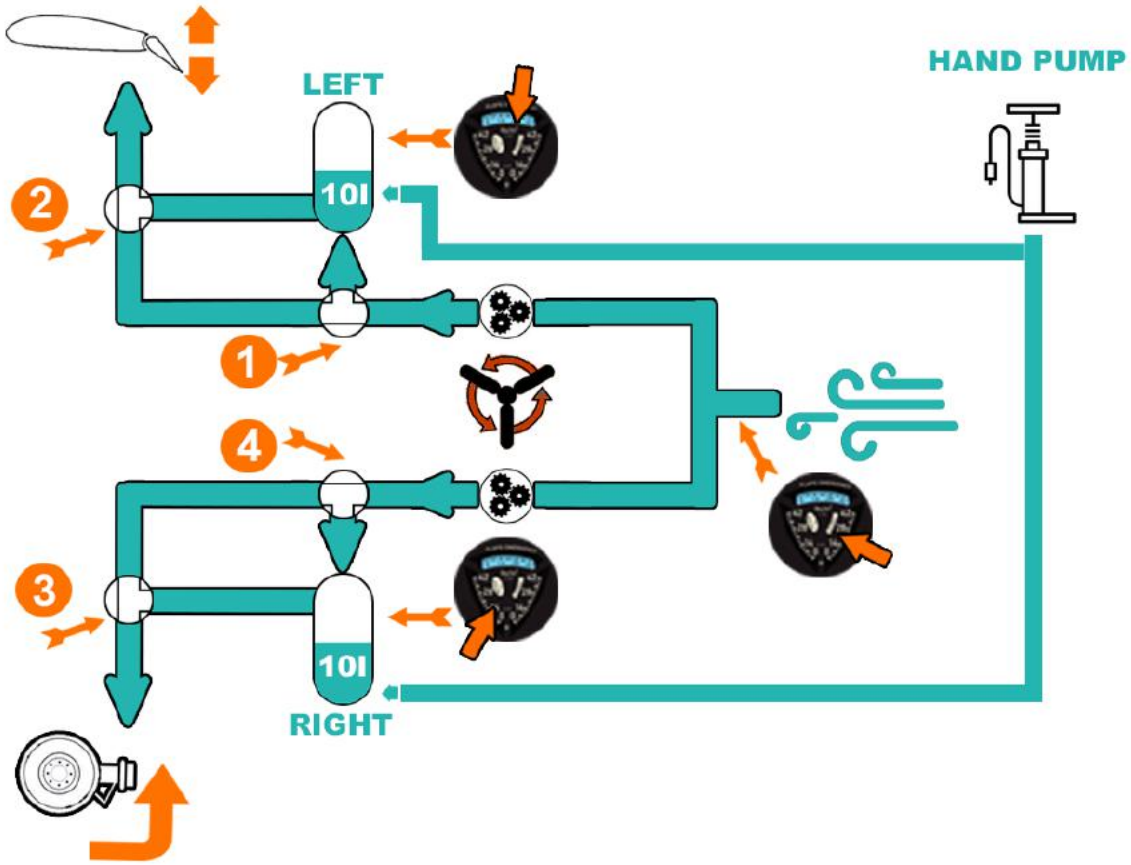
The air intake is made in front of the nose via a device through the propeller's central axis.

The engine drives a double pump that supplies all the pneumatic pressure to the circuits of the aircraft.

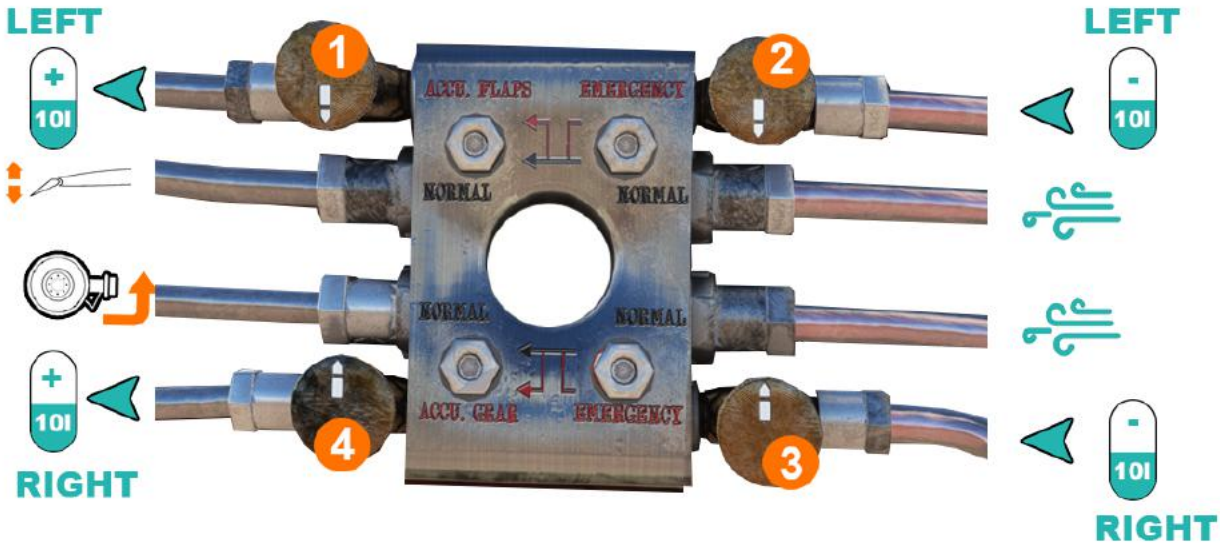
The pneumatic system is displayed by one indicator.



Two tanks (10 liters each) can be used in case of emergency, one for the flaps, and the other for emergency landing gear.



PNEUMATIC SYSTEM

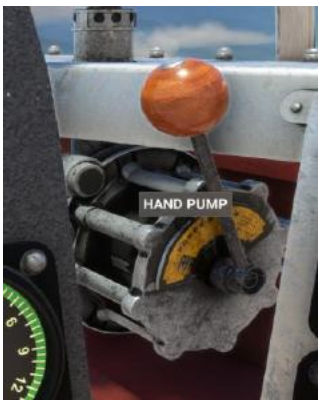


4 manual valves (1&2 for flaps and 3&4 for landing gear) are managing the normal and emergency process to feed critical aircraft systems.

- The valves on the right are for emergency use of backup pressure
- The valves on the left are to feed /refill emergency backup pressure.

In case of pneumatic leak, closing left and right valves of one circuit (example valve 2 to emergency and Valve 1 to ACCU FLAP) will close all pressure to the normal system.

Pilot can use a hand pump to add pressure in both backup system (32 movement to refill both emergency tanks).



All instruments can be read in French or English and with French or English values according to the selection on the clipboard menu page.

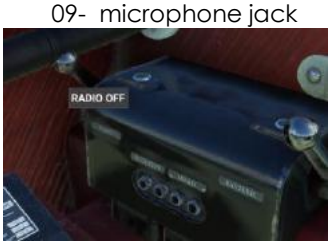
RADIO

The radio system in 1939 is still very heavy and imposing (25 Kg – 55 lbs).

It is not installed by default in the AIR RACE version.
However, you can integrate it on the ground as an option on the clipboard.

The ADF (12Kg - 26lbs more) imposes the installation of a complete Tx/Rw radio equipment.

01- ADF AREA if installed.
02- Primary freq. switch
03- Secondary Freq. switch
04- Primary freq. selector
05- Secondary Freq. selector
06- Rx volume
07- Tx gain
08- headphone jack
09- microphone jack



To operate the radio requires an electrical source (battery or engine alternators) and the radio/ avionics lever activation on its right.

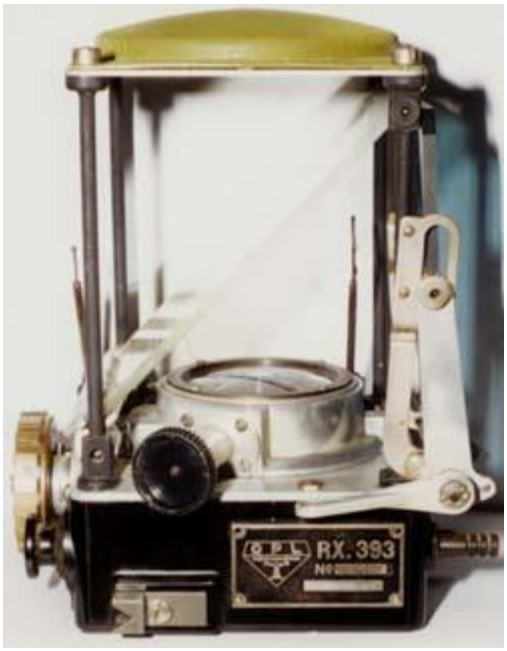
WIKI SEE chapter 11.0 for all information's on version and default equipment

The old frequencies of this radio are not compatible with the current frequencies in MSFS, so this system is not operational.
Use ATC to manage the radio frequencies in game.

VISOR

The collimator " OPL 39 " (Optique et Précision de Levallois, model RX 39) was nicknamed the lantern or the Greek temple.

W.I.P.



10 Easy -Normal -Realism modes

Easy mode:
- Infinite fuel
- no pneumatic failure
- Easy mode can be change to normal or realistic mode even in flight.

Normal mode:
- by default
- Engine and pneumatic failures
- Normal mode can be change to easy or realistic mode even in flight.

Realistic mode:
- Realism mode can be modified to another mode only while on the ground.
- Currently INOP in this version

11.LIVERIES

F-GEBP AIR RACE "BLUE BUGATTI" original N°1

AIR RACE "GREEN BUGATTI" UK N°2

AIR RACE "Silberpfeil" GE N°3

AIR RACE "Golden bullet" SPAIN N°4

AIR RACE "TIGER" N°7

AIR RACE "REDWING"

AIR RACE "TEXACO" N°8

AIR RACE "GULF NETHERLAND"

F-GEBM MILITARY FRANCE 1940

YAKOVLEV 1941

12.VERSIONS

Installed	Optional Via Clipboard	Not available

Livery	Version	VHF	ADF	G meter	Tank	weapons	O2	Modern cockpit
Original	Air Race							
Gulf Netherland	Air Race							
Germany White	Standard							
Spain Golden Bullet	Air Race							
UK green	Standard							
Armée de l'Air	Military					*		
Texaco RED	Standard							
REDWING	Air Race							
Yakovlev	Military					*		
Flying Tiger	Air Race							

* **Weapons are forbidden on Microsoft Marketplace. They are not visible by default. Please contact us on discord to enable them.**