This documentation is for FLIGHT SIMULATOR GAME USE ONLY

FARMAN F.60

FLIGHT MANUAL
EN 1.0.0

Microsoft Flight Simulator

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HISTORY

1.HISTORY

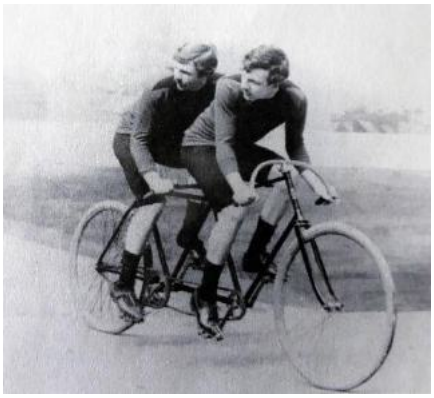
1.1 FARMAN BROTHERS until 1935

The Farman brothers, English by their parents, were born and spent their youth in Paris, France.

They were three brothers: Dick, born in 1872, Henry in 1874 and Maurice in 1877.

Dick was an engineer. He installed the first electric tramway in Rio de Janeiro in Brazil.

Henry and Maurice will launch out in the race cyclist on track to beat in tandem of numerous records..



Henri, He then revealed himself in car racing but also in painting with his mentor Gustave Courtois.

Also very sporty, Maurice, as early as 1908, was climbing and skiing in Chamonix.

Henri made a few attempts with a glider, but it was Maurice who first flew in a balloon and passed his balloonist's license.

Henri bought in June 1907, a plane Voisin with engine Antoinette of 50 CV to try to beat the Grand Prix of the aviation of 50 000 francs-gold.

He made his first tests on the field of Issy-les-Moulineaux

After tests and some technical modifications Henri improved the world record of distance for a heavier-than-air aircraft by taking off then flying on a distance of 700 m.

After six months, Henri Farman made a demonstration of take-off, turn and landing without damage on 1kilometre in front of the prize donors.

Henri developed the concept of ailerons to facilitate the turns. He received the patent n°5, his brother, Maurice, received the n°6, on November 18, 1909.

The two brothers then built their first plane and won many speed and altitude records throughout Europe.

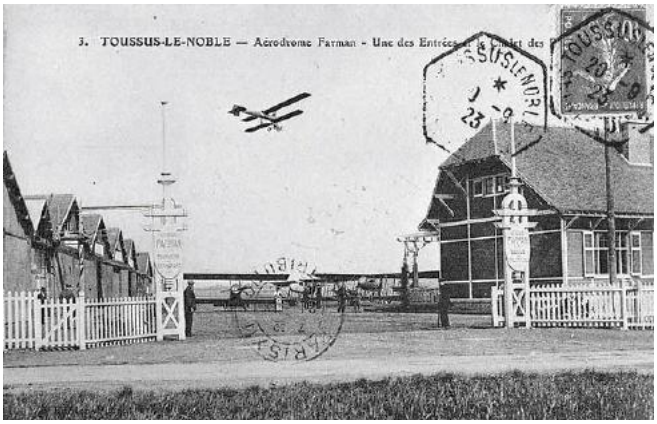
During the first world war, the planes of Henri or Maurice were delivered to the French and English aviation companies.
These planes were used for observation or bombing, but mostly as training aircraft.

F.30

At the request of the French government, the three brothers joined forces to create the Société Anonyme des usines Farman.

F.40 Horace

The field of Toussus le Noble where Blériot is already located (in Buc.) will be chosen as the take-off and test runway.



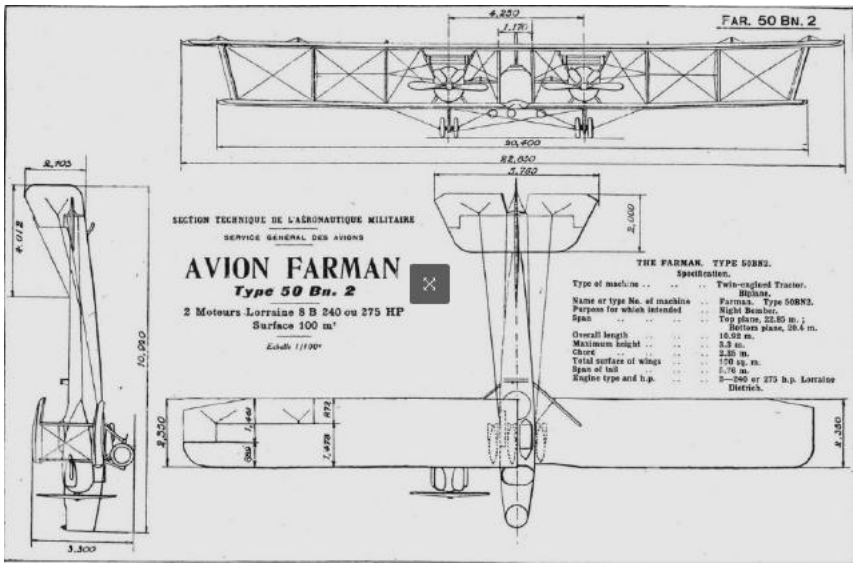
In 1925 they developed the first blind flight simulator for their flight school where the whole world came to train

Between 1929 and 1930, French aviation kept an international aura, marked by records and raids. Farman-Goliaths were sold to Romania, Cuba and even Japan.

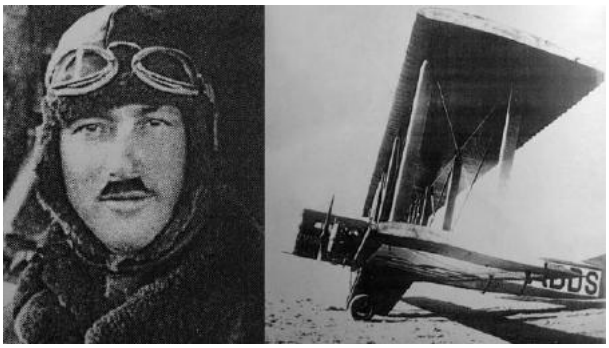
1.2 F.60 HISTORY

In 1918, Henri designed a modern biplane.

The F.50 Goliath was to be a bomber capable of carrying 1000 kg of bombs over a 1500 km circuit.
But it arrived too late to take part in the conflict.



The aircraft was then converted into a commercial civil passenger aircraft and renamed the F.60
After several publicity flights, the first commercial flight was planned between Toussus le Noble and London.



As non-military flights were not authorized at that time, Lucien Bossoutrot and his passengers were all former military pilots wearing the appropriate uniform and mission order.

The outbound flight lasts 2 hours and 30 minutes.

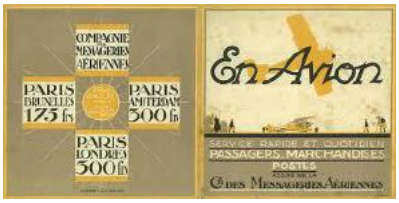
On April 3, 1919, 14 passengers were transported to an altitude of 6,200 m (20,341 ft).
On August 11, 1919, an F.60 carried eight passengers and one ton of equipment from Paris to Koufa, via Casablanca and Mogador, 180 km north of Saint-Louis du Senegal, a flight of over 4,500 km.

The airlines, which appeared very quickly throughout Europe, were quick to acquire the F.60.

In 1920, the Compagnie des Grands Express Aériens (CGEA) began to operate regular flights between Le Bourget and Croydon.

The Compagnie des Messageries Aériennes (CMA) soon followed suit.

The Société Générale de Transports Aériens (SGTA) opened a Paris-Brussels route in July 1920
. In May 1921, this route was extended to Amsterdam. The Belgian company Société Nationale pour l'Etude des Transports Aériens (SNETA) also opened a Brussels-London route in April 1921.



1.3. F60 Versions

FF.60 Designation for the first three prototypes.

F.60 Civil passenger transport version: two Salmson CM.9 engines (260hp)

F60bis two Salmson 9AZ engines (300hp)

F60Bn.2 Three seat night bomber , two Salmson 9Zm (260hp) for French army and navy (not a sea planes).

F.60 Torp. French navy sea plane, two gnome-Rhône 9A Jupiter radial piston engines (400hp)

F.60M 1924 Blunt nose version , two Reanult12Fy engines (310hp)

F.61 Goliath with two Renault 12Fe (300hp)

F.62 Only one Farman 12We single engine (500hp) to brake records

F.62 BN.4 Export version for the Soviet Union , two Lorraine-Dietrich V-12 engines (450hp)

F.62 BN.5 5 Seat night bomber, two Lorraine-Dietrich 12Db engines (400hp)

F.63 BN.4 two Gnome-Rhône 9A Jupiter engines (450hp) for French air force

F.63Bis Front cabin, Two Armstrong Siddeley Jaguar II A engines (365hp)

F.63Ter Airliner, two Gnome-Rhône 9Aa Jupiter (380hp)

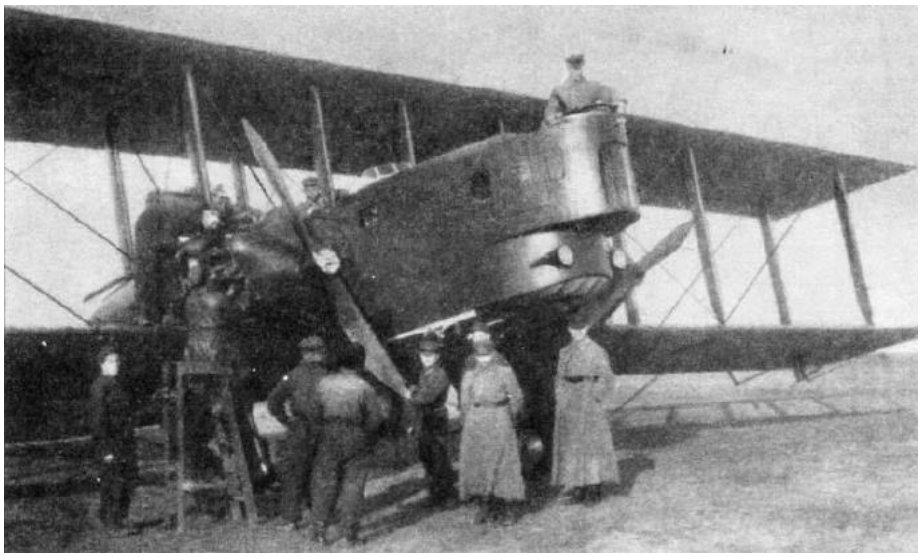
F.65 sea/ground plane torpedo bomber, two Gnome-Rhône 9Aa Jupiter (380hp) for French navy

F.66 sea plane torpedo bomber, two Salmson CM9 (260hp) for French navy

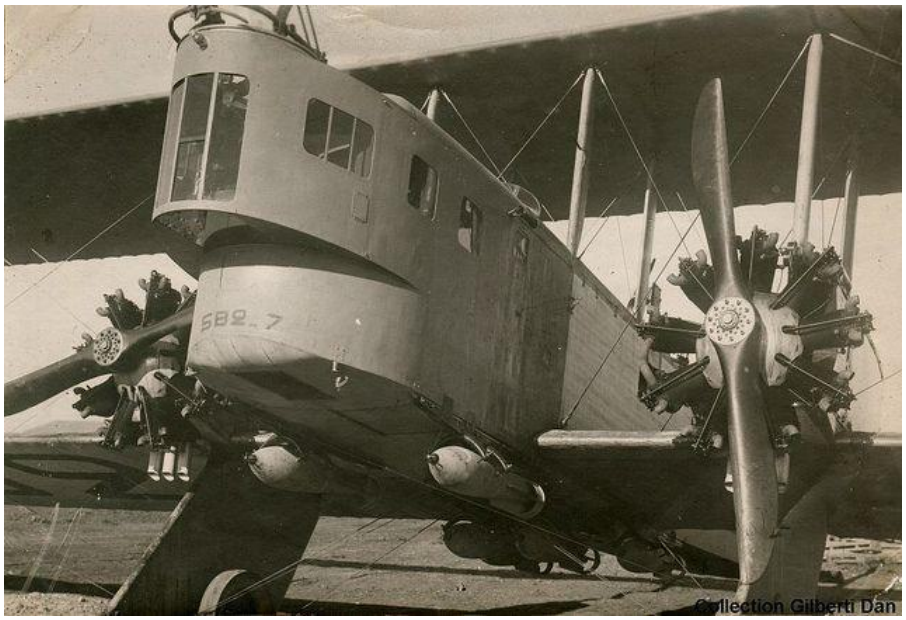
F.66 BN.3 Single Gnome-Rhône 9Aa Jupiter (380hp) for Romania export.

F.68 BN.4 Bomber aircraft, two Gnome-Rhône 9Aa Jupiter (380hp) for Poland export.

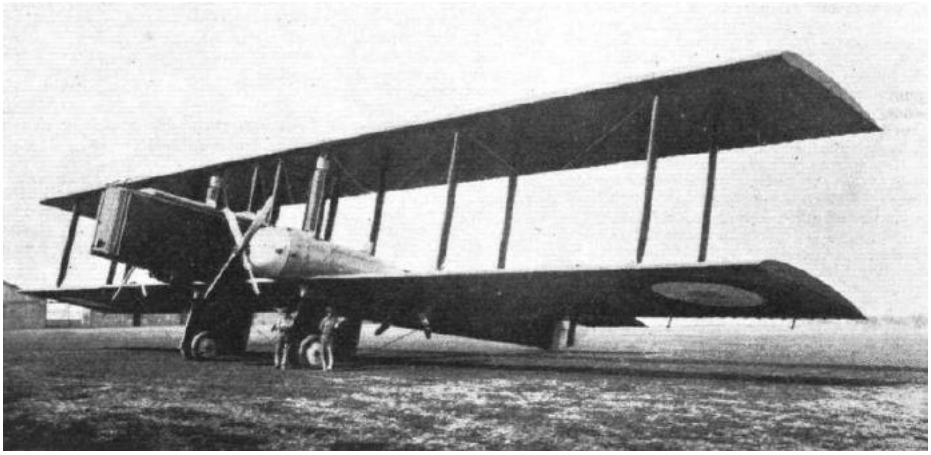
F.140 Super Goliath, super heavy bomber, four Farman 12We in tandem pairs (500hp)



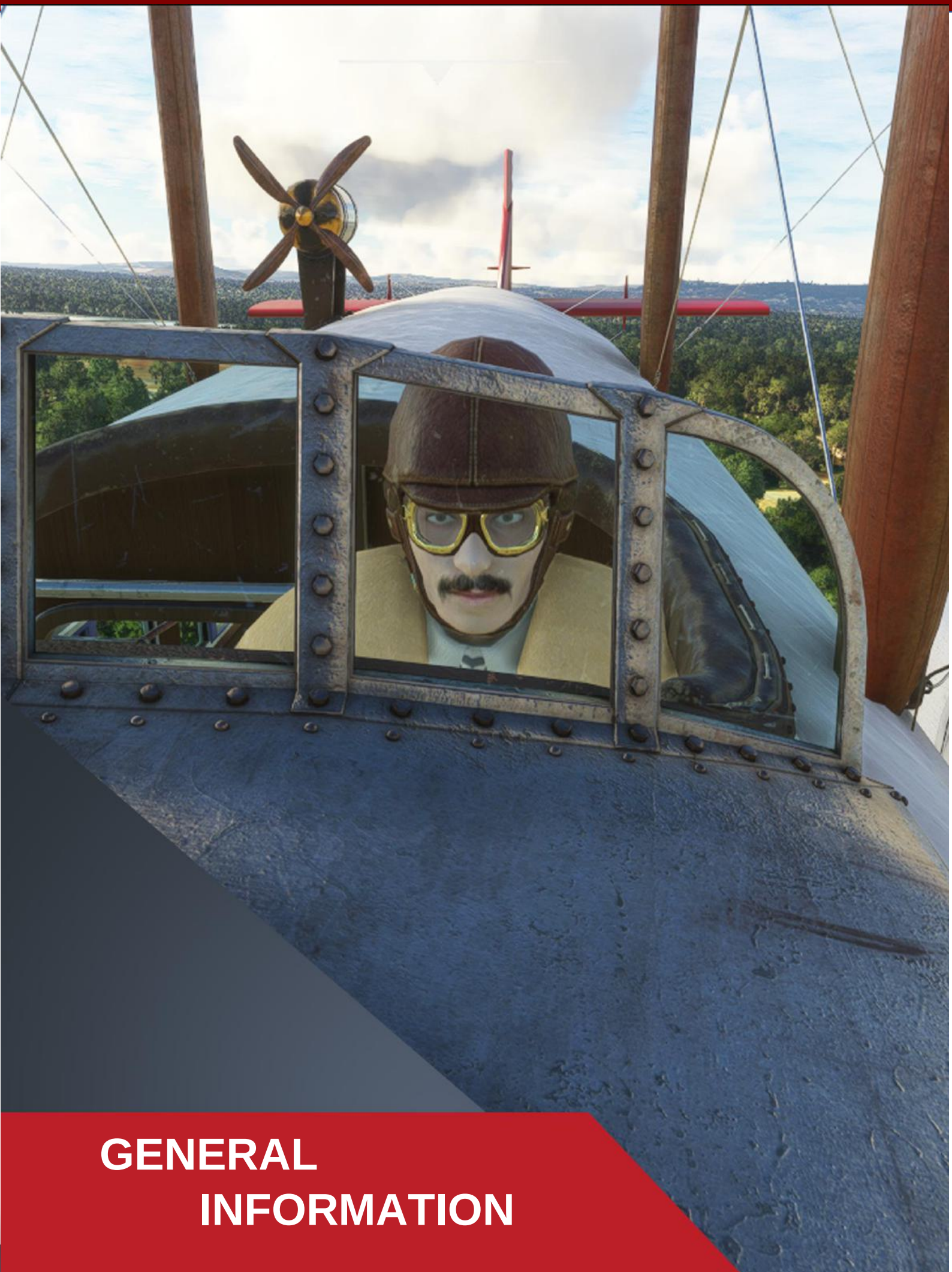
FARMAN F.62



FARMAN F.65



FARMAN F.140



GENERAL INFORMATION

2. GENERAL INFORMATION

2.1. SPECIFICATIONS

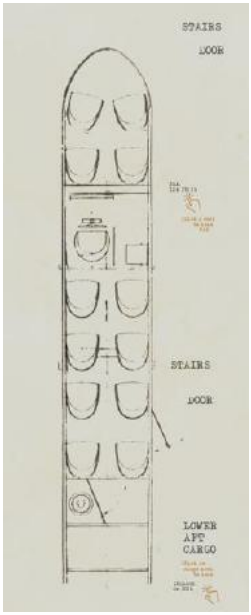
Commercial versions:
Crew: 1 pilot, 1 mechanics
Passenger's: 12

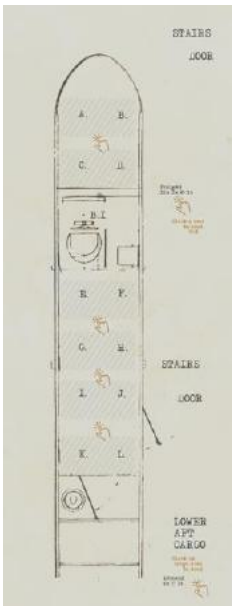
Cargo version:
Crew: 1 pilot, 1 mechanics

Military version
Crew: 1 pilot, 1 mechanics
1 navigator, 1 bomber

Range: 400 km (250 mi)

Service ceiling: 4000 m (13,100 ft)






Only cargo version can use nonstop pickup mail system with mail hook

2.2. DIMENSIONS

Length: 14.77 m (48 ft 5 in)

Wingspan: 26.5 m (86 ft 11 in)

Propellers: 2-bladed fixed pitch propellers

Wing area: 160 m² (1,700 sq. ft)

Height: 4.9 m (16 ft 1 in)

2.3. WEIGHT

Empty weight: 2,500 kg (5,511 lb)

Useful load: 2370 kg (5,224 lb)

Gross weight: 4,870 kg (10,737 lb)

2.4. ENGINE

The engines were produced at Salmson's factory at Billancourt near Paris was expanded during the First World War, and a second factory was opened at Villeurbanne near Lyon.

Cylinders 9-cyl radial

Year 1917

Bore 125 mm (4.921 in)

Stroke 170 mm (6.693 in)

Power 186.4 kW (250 hp) at 1400rpm

Cooling system: Water with radiators

2.5. PAYLOAD AND C.G.

Balancing CG

The FARMAN F.60 is designated for take-off and landing operations at a Center of Gravity (CG) between 18% and 40% MAC

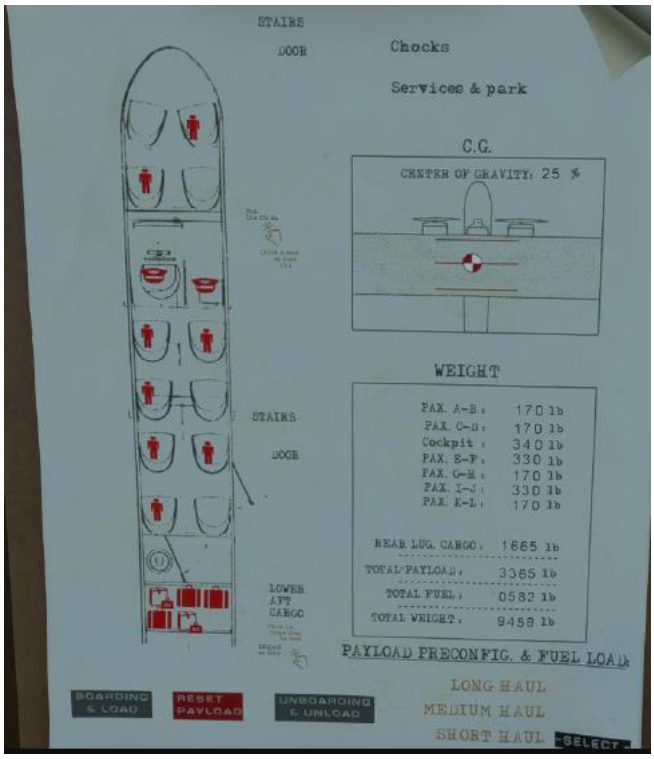
2.6. PAYLOAD EXAMPLES

There are 3 pre-configured options for fuel and payload:

- Long Haul / Heavy plane (100% fuel and CG balanced payload)
- Medium haul / Standard plane (50% fuel and CG balanced payload)
- Short haul / Light plane (33% fuel and CG balanced payload) Press BOARDING to load your payload

Press UNBOARDING to unload the plane.
Press RESET to reinitialize payload.

If you select another configuration, such as long, medium or short haul based on travel distance, you will have to configure passengers and luggage to maintain the CG near 29.0%, especially for heavy take-off.



Please do not use MSFS weight and balance UI

After a selection and/or a modification please validate the new “blinking” payload by pressing BOARDING & LOAD .

Please refer to CLIPBOARD CHAPTER for more information

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PERFORMANCE

3. PERFORMANCE

3.1 NORMAL PROCEDURES - SPEED

Take-off speed:	32 kts / 59 km/h
Climb speed:	40 kts / 74 km/h
Cruise speed:	65 kts / 150 km/h
Max. speed:	100 kts / 180 km/h at sea level 91kts / 170 km/h at 1000 m (3300 ft) 89 kts / 165 km/h at 2000 m (6600 ft) 86 kts / 160 km/h at 3000 m (9800 ft)
Ceiling	13.123 ft / 4000m
	1,000 m (3,300 ft) in 4 minutes 59 seconds 2,000 m (6,600 ft) in 11 minutes 31 seconds 3,000 m (9,800 ft) in 19 minutes 48 seconds 4,000 m (13,000 ft) in 31 minutes 2 seconds
Average autonomy	7 hours / 216 NM / 400km

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PANEL GUIDE

4. PANEL GUIDE

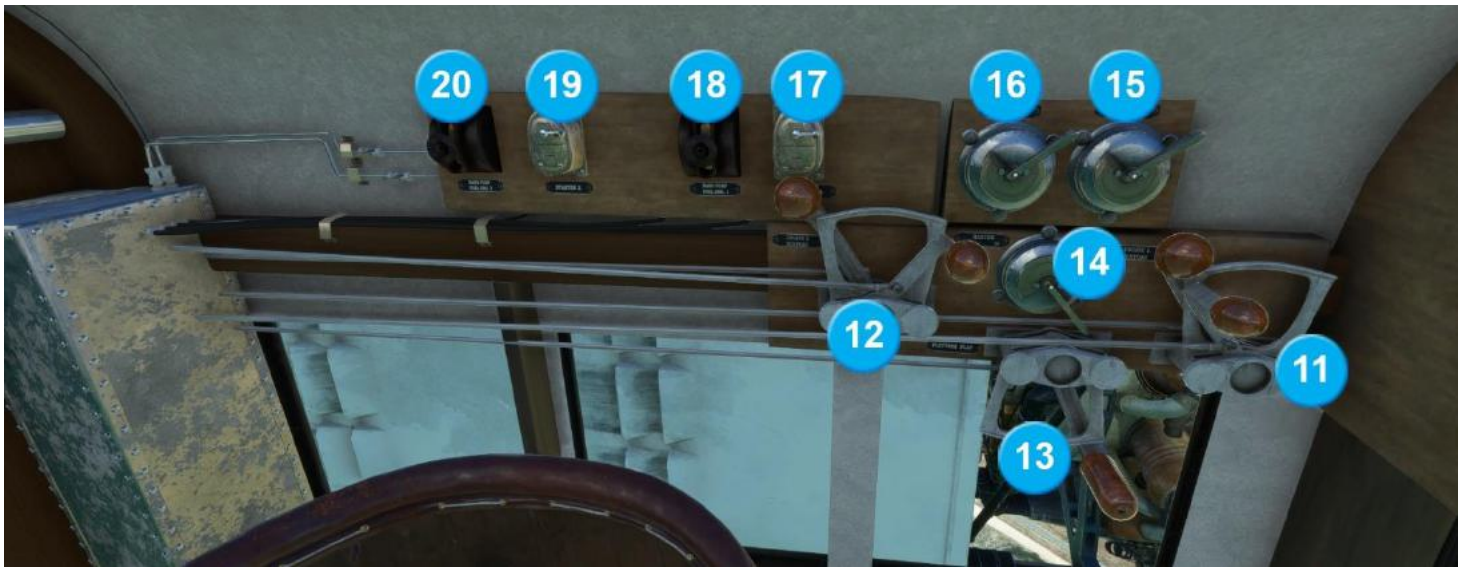
4.1 MAIN PANEL

A. INSTRUMENT PANEL PILOT
B. LEFT SIDE PILOT
C. PILOT SEAT AND CONTROLS
D. CLIPBOARD

4.1.1. INSTRUMENT PANEL – PILOT

1. Tachometer left engine
2. Tachometer right engine
3. Altimeter
4. Airspeed indicator
5. Fuel tank left front & rear
6. Fuel tank right front & rear
7. tank left selector
8. tank right selector
9. Cabin light switch
10. Landing light switch

4.1.2. LEFT SIDE PILOT

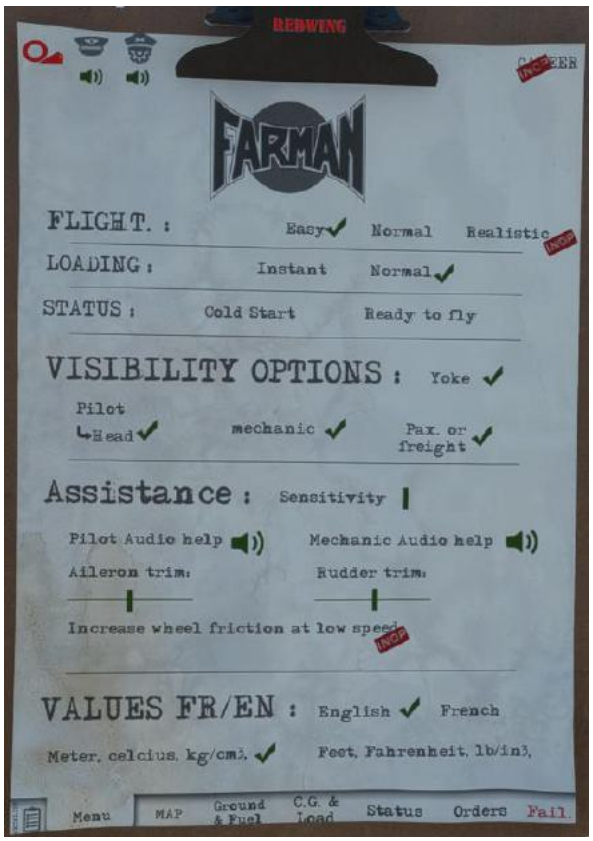


11. Throttle lever engine left
12. Throttle lever engine right
13. "Flettner" elevator trim
14. General switch on/off
15. Ignitor engine left
16. Ignitor engine right
17. Starter ignitor engine left
18. Fuel hand ppump engine left
19. Starter ignitor engine right
20. Fuel hand pump engine right

4.1.3. PILOT SEAT & CONTROLS

21. Pilot seat
22. Mechanics jump seat
23. Yoke
24. Rudder
25. Magnetic compass

4.1.4. CLIPBOARD -PAGE 01 - MENU



FLIGHT can be set to **EASY, NORMAL** or **REALISTIC**

EASY mode:

- no failure
- Help lights
- can switch to normal or realistic

NORMAL mode:

- failure can be stopped
- No help lights
- can switch to easy or realistic

REALISTIC mode; **NOT AVAILLABLE IN THIS VERSION**

- real and hazardous failures
- Career mode
- Impossible to change mode in flight

LOADING can be set to INSTANT or NORMAL

INSTANT: Loading and unloading are done quickly (10 seconds)

NORMAL loading and unloading are 10x longer than instant

STATUS can be set to **COLD&DARK** or **READY TO FLY**

COLD & DARK: all switches, lights, and engines are OFF.

READY TO FLY: all switches, lights, and engine are on with P.A. ready.

VISIBILITY OPTIONS: Show or hide 3D for Yoke pilot (and head) , mechanic, pax and/or freight in cabin.

ASSISTANCE: Change sensitivity of "Fletner" / elevator trim from x1 to x7
Turn on/off pilot Voices or mechanics voices
Increase Wheel friction to simulate brakes **(INOP. on this version)**

VALUE FR/EN can be set to ENGLISH or FRENCH, to change voices and texts including instruments in FR or EN

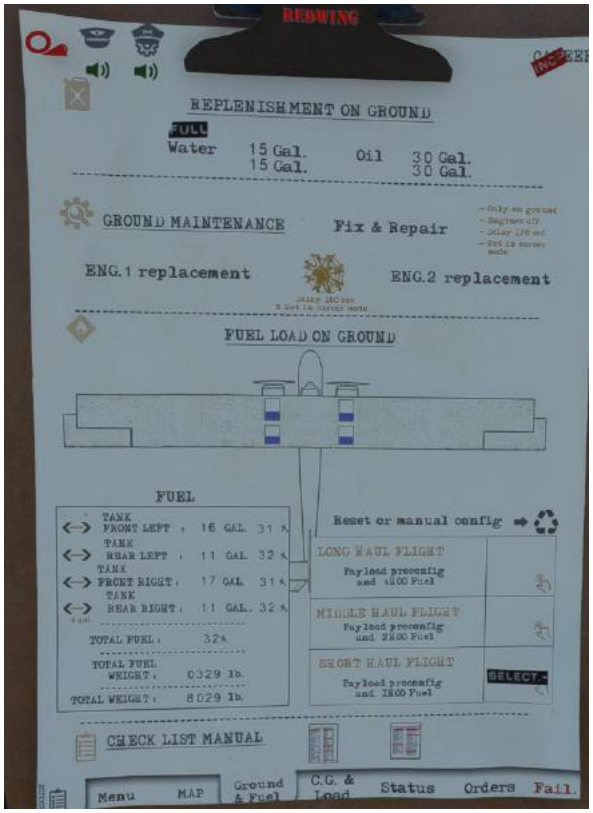
Instruments can also be set to Meters, Celsius, KG/cm3 or Feet, Ft, lbs…Etc.

"POS up" and "POS right" are to select an alternate position for the clipboard

Press the clipboard clip to store it

Chocks can be "in place" or removed (park brake)

4.1.5. CLIPBOARD -PAGE 02 – FUEL



Replenishment for Oil and Water can only be used while on ground.

Fix and repair (only on ground) can repair: Tires, elevators, ailerons, rudders, fuselage, oil or fuel failures, water and radiator failures, generator and propellers.

ENG 1 &2 replacement is used to change complete engine and reset the engine hours usage.

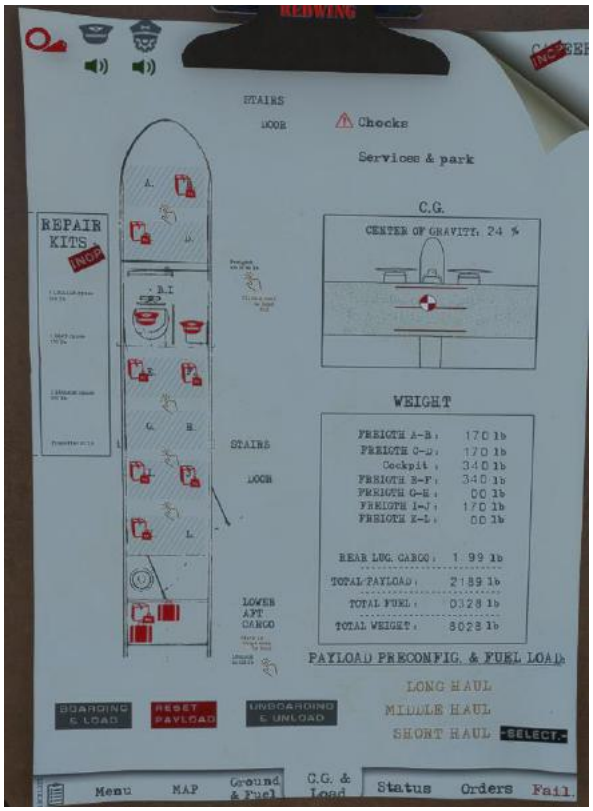
FUEL LOAD ON GROUND manages all tanks fuel.

Config can be reset with RESET OR MANUAL CONFIG icon.

Pre-configuration for long haul (100%) medium haul (50%) or short haul (25%) can be selected to simplify fuel config (and payload on C.G & load page).

CHECK LIST MANUAL gives access to the dynamic checklist pages.

4.1.6. CLIPBOARD -PAGE 03 – C.G. and LOAD



Press on a seat to add/remove passengers

Press on rear cargo (X1 to x6) to add/remove luggage.

After each modification… information starts blinking until BOARDING & LOAD is pressed to validate and start the loading/boarding process.

Press UNBOARDING & UNLOAD after landing to remove pax/freight from the plane.

Press RESET: to reinitialize all payloads.

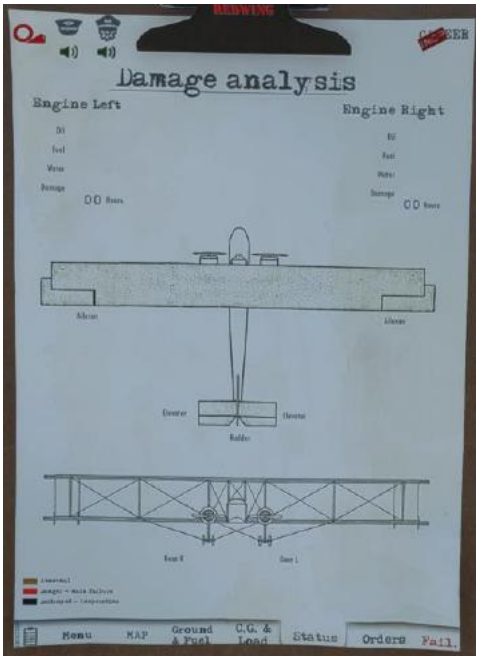
Press STAIRS or DOORS to open/close and/or install/remove front and rear services.

Press CHOCKS to simulate parking brake

Press Services & park to add/remove repair stairs and other services details, including luggage display before boarding.

LONG, MEDIUM, SHORT HAUL can be selected to use preconfigure payload (Passengers, baggage & fuel)

4.1.7. CLIPBOARD -PAGE 04 – STATUS



This page displays all trouble and failures:

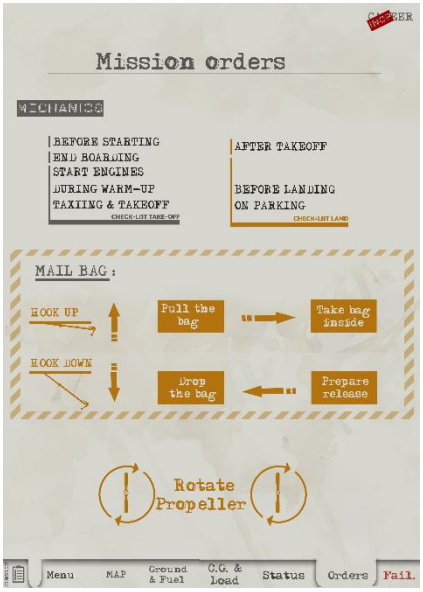
In yellow/amber: caution and abnormal conditions

In red: Warning, danger main failure

In black: Destroyed, inoperative element/system.

Other details such as icing, generator failure or engine damage can be displayed here.

4.18. CLIPBOARD -PAGE 05 – ORDER



Rotate propeller can be used for engine stirring before a start to avoid damage motor.

Press MECHANICS to active all checklists

Press a checklist to start AI checklist with voices.

Details and dynamic checklist are available by pressing the left down icon.

MAIL BAG area is only available in cargo versions:

Lower hook to prepare a non-stop mail bag pickup.

When a bag is hooked up use PULL THE BAG to retrieve the bag near to the rear door.

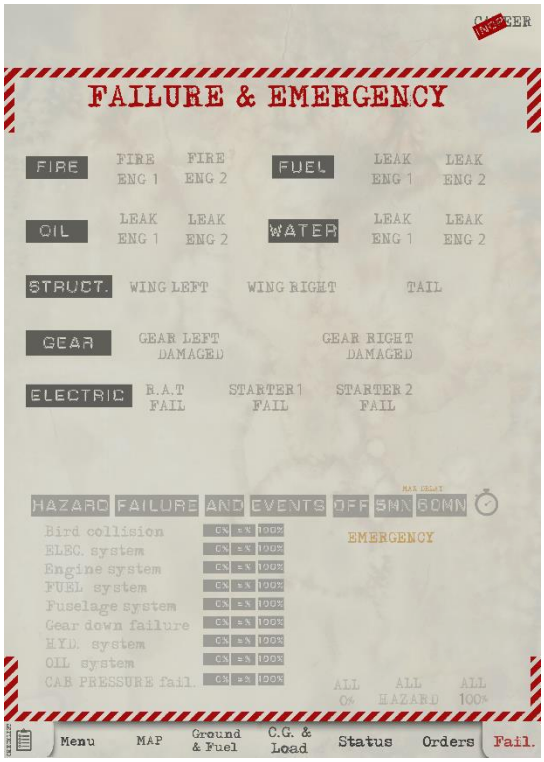
Use TAKE BAG INSIDE to finish the pickup and close the door

Use PREPARE RELEASE to open the rear door and ask the mechanics to prepare a mail bag drop.
Then use DROP THE BAG to drop the bag on a MAIL target area.

A plane can carry up to 9 mail bags. Bags are automatically placed in cargo area behind the mechanics' seat.

Caution when a bag is caught by the hook, more than 25 lbs. are added far rear of C.G. causing pitch increase, until you bring the bag onboard. In addition, the door will cause yaw when opened. So you will have to apply rudder to keep the plane flying straight and watch your airspeed as it may drop quickly.

4.1.9. CLIPBOARD -PAGE 06- FAILURES



In EASY and NORMAL mode, the user can create and/or stop a specific failure.

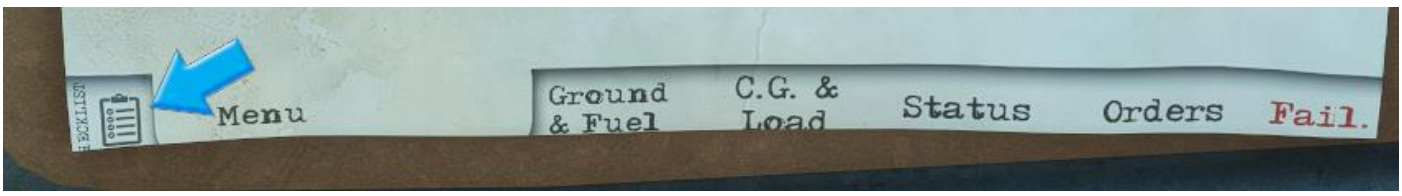
The lower page is not available in this version.

In EASY and NORMAL mode, you will be able to create and manage hazardous failures over the time.

In REALISM mode all failures are automatically and hazardously generated.

Reward for failure management in career mode is only available in REALISM mode.

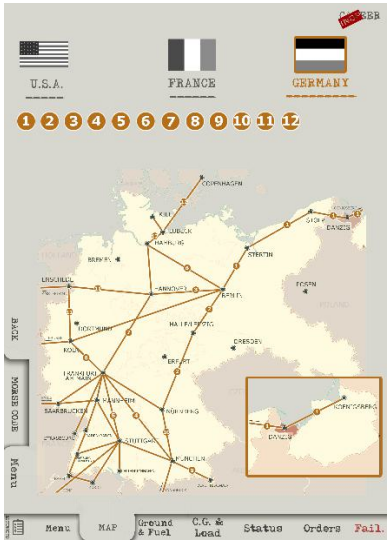
4.1.10. CLIPBOARD -PAGE 07- CHECKLISTS

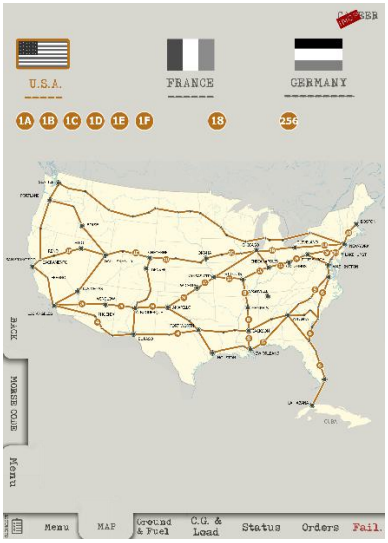


All checklist and essential information are always available on the lower left corner of the clipboard.

Normal checklists are dynamic and follow the orders done by pilot and co-pilot via the order/checklist page.

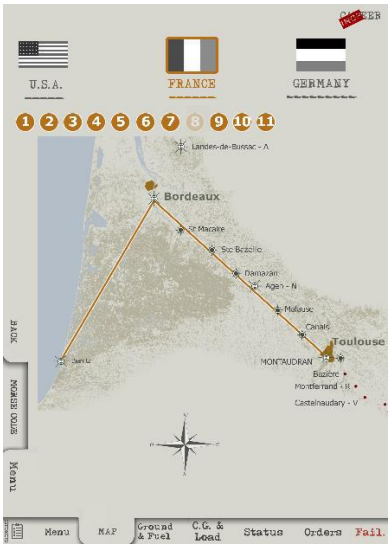
4.1.11. CLIPBOARD -PAGE 08 MAP

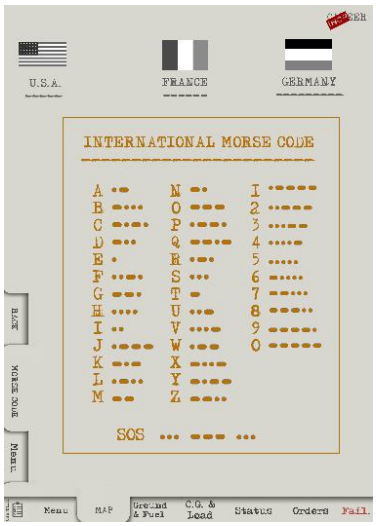




Maps of the air routes as well as the countries included in the scenario's FRANCE35, GERMANY35, and USA35 from REDWING can be read on the clipboard MAP page

Select a country and a Contract AIR Mail (CAM) route number to view a detailed map for that area.





Press "morse code" tab will help you identify the Morse code information of the air lights since no radios were present on this era airplanes. **Visual navigation was required.**

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NORMAL PROCEDURES

5. NORMAL PROCEDURES

5.1. TAKE-OFF

Pilot manages the take-off and the mechanics is checking all engines, cabin passengers and/or freight.

Before take-off, the pilot is checking 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 left and right engine
- Landing light (if available) is on

Pilot sets the throttles (left & right) to 100% and wait for tail raise above 30kts.

A wash effect on ground could be compensate with right rudder to avoid a left turn effect.

When speed increase to 35-40 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 45 knots.

Target cruise speed is 55-70 knots depending on weight.

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

On ground avoid aileron operation to avoid wings touching ground.

This aircraft has no brake, to stop aircraft or to help turning. Only use rudder and engine power balance (Left/Right).

5.2. Cruise

Power should not exceed 1800 RPM in nominal flight.

Use RPM above 2000 RPM during 3 minutes could damage the engine and reduce its life time.
Use RPM above 1900 RPM during 5 minutes could damage the engine and reduce its life time

Engine time life is limited to 100 hours (150 hours in real life)

5.3. Descent and Landing

There is no flap or landing aid installed on this aircraft, but the approach speed is very low when the airplane is trimmed properly and the landing distance very short. It is therefore quite easy to land on any field or airfield when configured correctly.

Land slightly tilted back to touch down with both wheels of the main gear or better yet a 3 point landing is more desired. 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.

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

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TIPS FOR PILOTS

6. TIPS FOR PILOTS

6.1 Engine mixture

Since the on-board instruments are very limited, the pilot must manage the engine mixture by ear to avoid over-consumption of fuel.

An engine that is too rich emits a bluish-black smoke and indicates too much fuel in the mixture.

An engine that is too lean creates vibrations, then chatter and finally stops due to lack of fuel.

A mixture that is too rich over a long period of time could clog and shorten the life of the engine.

6.2 During Taxiing

The limited visibility in the cockpit and the absence of brakes makes the ride complicated.

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

To bring an aircraft to a complete stop, a strategic U-turn was used to reduce ground speed.

6.3 Repair the aircraft

Although robust, the Farman F.60 is made of wood and canvas.

The crews were experienced in basic repairs to finish their flights.

Some hose failures (radiator, oil, gasoline) were managed in flight by the mechanic who went out on the wing attached with a simple rope. *This process is not recreated in MSFS.*

More complex breakdowns required the pilot to land in a field to repair and then take off again continuing the flight.

As soon as the plane is on the ground, the essential failures can be solved in this way.

In normal mode, all breakdowns can be repaired on the ground, including engine, wheel exchanges and heavy structural repairs.

In realism mode, you must have a repair kit with you, which takes the place of a passenger/luggage/cargo and weighs 200 lbs.

This kit allows the exchange of wheels, engine parts, as well as a propeller. Simple repair of the fuselage and structure is partially possible while not at an airport.

Don't forget the repair kit if you want to complete a full flight and validate your transports in Career mode

6.3 Standard day flight

Always keep your view of the ground and do not fly through cloud cover. The aircraft is not equipped for blind flight as no radios nor electronic navigation equipment was onboard.

In the 1920's, aircraft generally followed railroads and rivers to navigate to their destinations.

Fly at the right height so you always have an eye on an emergency landing zone.

6.4 Standard night flight

This aircraft is not designed to fly at night, nevertheless, a landing light system allows to detect the proximity of the ground.

The main instruments and their needles are reflective at night and the mechanic can assist you with his flashlight (ALT+L).

6.5 Variables persistency

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

We use these variables to give persistence to the aircraft, to save technical data for maintenance purposes and in the future to create a career mode for your pilots and aircraft fleets.

Engine (each) :

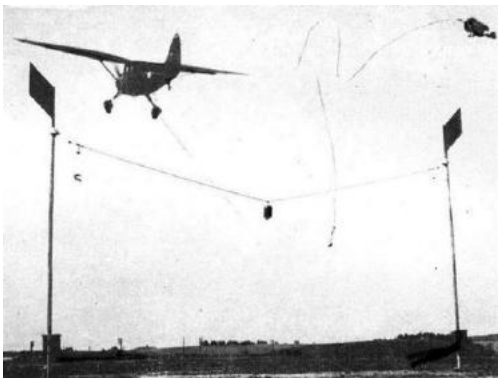
- Time of use
- Damage over time
- Failures fire, oil , fuel …Etc.
- Oil, and water quantities

Clipboard :

- Essentials (ex.: yoke hidden, seat positions….Etc.)
- Fly mode
- Clipboard position

Failures :all

6.6 NON-STOP PICKUP SYSTEM



The problem with airmail delivery to small towns was the long delays extended by take-offs and landings at each city.

To combat this, a system of ropes with masts was invented to allow the mail to be retrieved without landing.

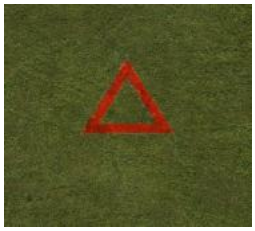
Only cargo planes are equipped with a recovery hook

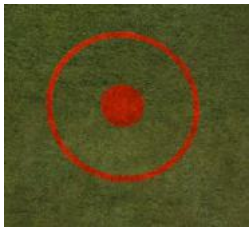
NON-STOP PICKUP MAIL are only availlable on some REDWING AIRFIELD 1935 SCENERIES

The aircraft's mail pickup hook, once in contact with the rope stretched between the poles, could lift the whole thing and continue flying. The flight engineer has to pull the mail back into the plane where it has been sorted and arranged en route.

To direct the aircraft a system of indicators/symbols and orange markings are drawn on the ground

Chevrons direct the aircraft on a trajectory to a triangle indicating the proximity of the recovery area.
Red and white masts with pennants and an orange line drawn perpendicular to the ground delimit the mail pickup zone.



The dropping is simpler because an orange DZ or dropping zone cicle is depicted for you to aim at. It is still tricky to hit the Target/DZ due to altittude variations, wind and pilot error.

Helpful indicator lights are available on EASY mode

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

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

This documentation is for FLIGHT SIMULATOR GAME USE ONLY

MORE INFO.

9. MORE DETAILED INFORMATION

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

Airspeed indicator and ETEVE
Ailerons, rudders, and elevators
Altimeter and altitude
Brake system
Clipboard
Direction, indicator compass
Electric system
Fuel system
Landing gear
Lights - external
Lights - interior
Magneto / ignition -starter
Oil engine system
Tachometer
Trim elevator - FLETTNER

AIRSPEED INDICATOR

A rotating backdrop displays the current speed of the unit, which can be read at the top center of the instrument

The lower part of the instrument gives information on the aircraft's pitch attitude to help you trim effectively for cruise conditions

The data is not very accurate and can vary rapidly. It is provided by a pitot probe in the nose of the fuselage and is subject to icing and other weather conditions.

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.**

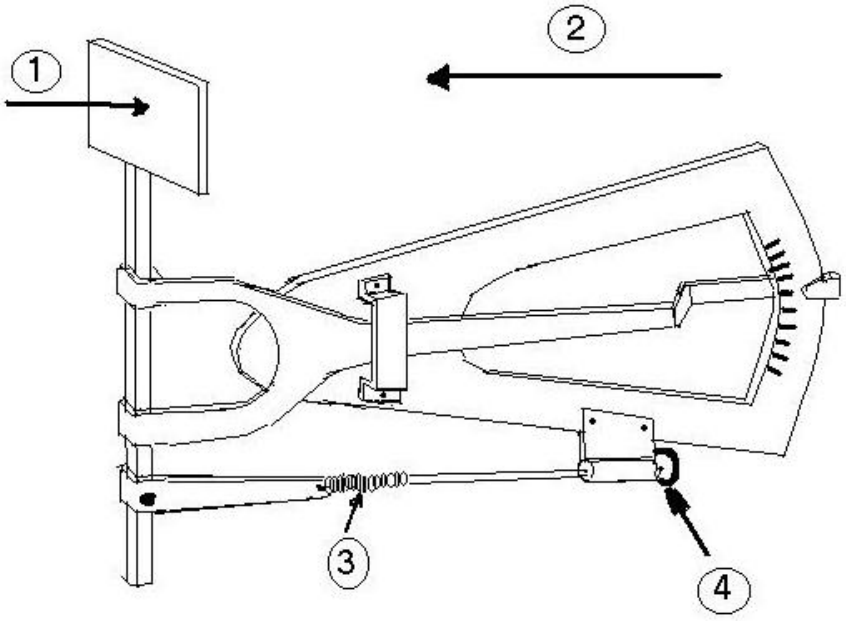
All instruments can be read in French or English and with French or English values according to the selection on the clipboard menu page.

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.

ETEVE AIRSPEED INDICATOR

In 1911, Albert Octave Eteve created a paddle speedometer which became standard on board French military aircraft. He also invented the first machine gun turret system.



1/ a paddle tilts back under the pressure of the relative wind
2/ Direction of flight
3/ Return spring
4/ Zero calibration adjustment knob

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 Farman F.60 there is only one elevator trim called "FLETTNER" but for convenience we have also created aileron and rudder trim to help stabilize the aircraft.

See section “FLETTNER” for more information's

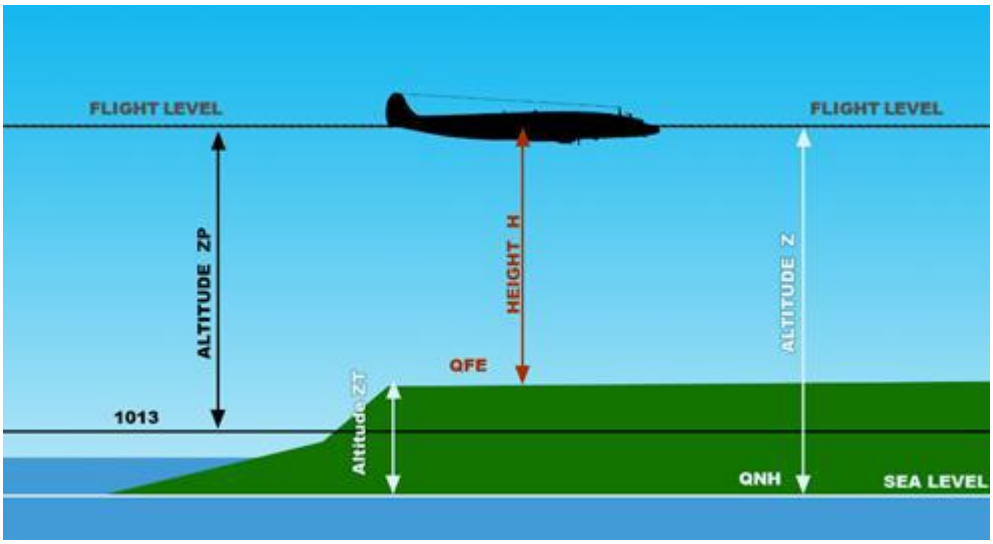
Robert Esnault-Pelterie invented the aileron (1905) by modifying a plane of his own construction designed after the Wright brothers' Flyer, then the joystick (1906) as well as the development of the star engine (1907).

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.



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.

BRAKE system

There was no braking system on the Farman F.60.
Only the tail stand could cause braking on grass runways and at low speed.

We created an option to intensify this ground friction (for example on hard runways).

You can ask at any time and on the ground to place the wheel chocks to simulate the parking brake.

The chokes instantly stop the aircraft that can cause a ground loop (tip forward and hit the nose) in the event of excessive speed.

Parking brake is activating chokes.

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

The aircraft does not include a battery. The electrical system was simply composed of a master cut-off switch and a wind turbine generating electricity in flight.

The electrical power was transmitted to the three landing lights as well as to the cabin ceiling lights.

Master on/off also feeds the Magnetos (ignitors, starter ignitors) and even EASY mode helping lights.

In case of RAM generator failure there is no more power for cabin and landing lights.

FUEL SYSTEM

There are two fuel tanks behind each engine labelled Front and Rear tanks

A Gold metal selector enables the transfer of fuel from the Front/Rear tank to engine.

A double tank level instrument for each engine displays front tank with an up needle and rear tank with a lower needle.

Engine are only powered by mechanical pumps when motors are running.

To start them it is therefore necessary to use manual pumps in order to initiate a sufficient pressure for the start-up.

More than 5 pumps on the hand pump is necessary for this process.
There is no fuel pressure indicator on this plane.

The pilots are therefore in the habit of pressing up to 6 or 7 times while waiting a second between each pump.

LANDING GEAR

The suspension of the wheels is created by "Sandow" rubber bands.
In case of hard landing, it is possible to lose a wheel. This may cause you to land on the reinforced wooden structure, but you will have to repair the gear before another takeoff is attempted.

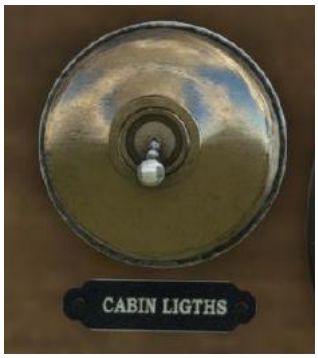
LIGHTS - EXTERNAL

There is no navigation or position lights.

Only three landing lights are available to aid in night landings.

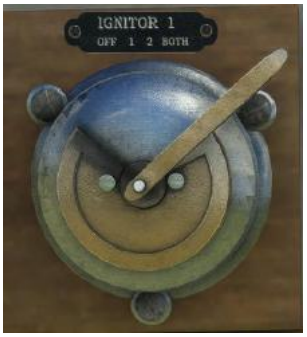
They are activated by a switch on the left of the pilot panel

LIGHTS - INTERIOR



Cabin light switch is located above landing light switch and will light up the passenger cabin area

MAGNETO – IGNITION – STARTER IGNITION



The aircraft ignition system produces a spark to burn-up the fuel/air mixture in the cylinder.

These systems are used to produces a spark and deliver it through an electrode of the spark plug in the aircraft engine cylinder.

This enables the proper consumption of the fuel/air mixture inside the combustion chamber, but this system cannot start the engine on its own.

For starting another system is used in conjunction with the Magnetos.

A Starter/crank lever must be turned many times to create a super spark.

If all conditions are met, then the engine should start.

OIL ENGINE SYSTEM

Each engine oil tank has a volume of 18.49 US. Gallons (70 litres).

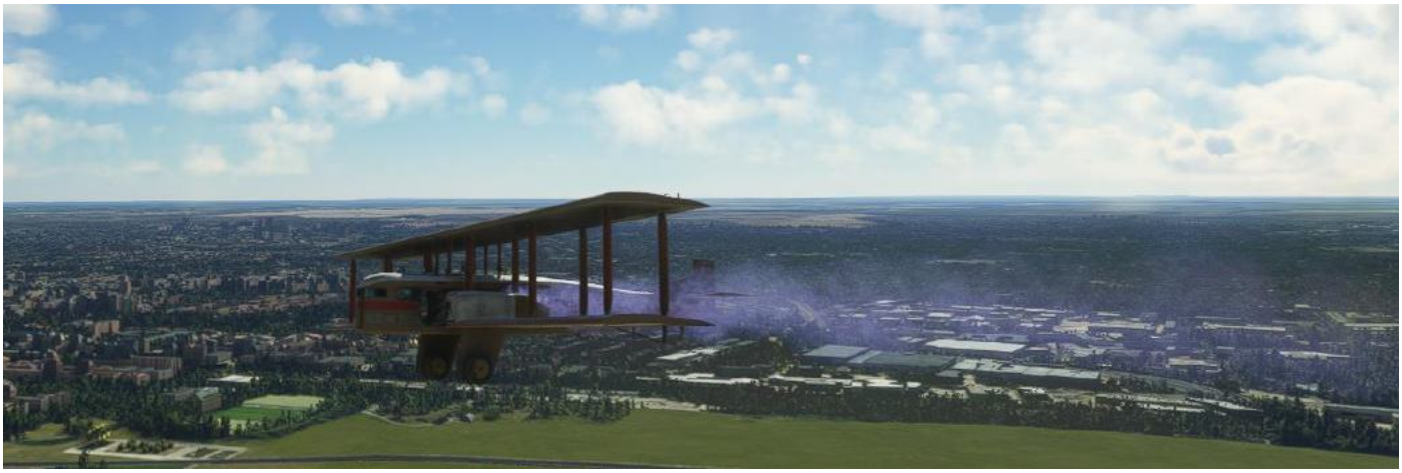
The oil pressure display is outside the cockpit on each wing cabane

A cold oil has a high viscosity and thus higher pressure

A hot oil is fluid and will have a lower pressure.

Castor oil was used to lubricate the engine for more than 7 hours, which was typical for a round trip.

After more than an hour of rest, all the engine oil fell to the bottom of the crankcase. It was therefore necessary to rotate (stir) the propeller to replace this viscous liquid in each cylinder and avoid ignition at the bottom of the engine, which could create an explosion or liquid lock (not allowing rotation).



In the event of an oil leak, bluish white smoke appears behind the engine.
Usually, black oil splashes spread all over the fuselage and engine nacelle.

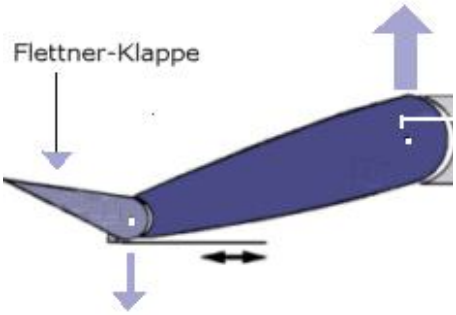
TACHOMETER

This instrument displays the speed of the motor in Revolutions Per Minute (RPM).

It is necessary to read the internal numbers of the dial (from 0 to 12) until the first complete turn of the needle then the external numbers of the dial from 12 to 24.
The revolutions per minute are indicated x 100

TRIM ELEVATOR TAB - FLETTNER

The aerodynamic trim adjusts the pitch of the command to maintain a constant climb on the yoke without the need of the pilot to pull the commands.



Anton FLETTNER a German engineer create a system to trim the elevator. This was crucial to maintain consistent flight attitudes for cruise.

Until 1945, he played a major role in the development of helicopters for the German Navy and the Aviation Ministry of the Third Reich.

He became a naturalized American citizen, and in 1949 founded the Flettner Aircraft Corporation, of which he was president. He then joined Kaman Aircraft, for which he developed, among other things, a successor to his Flettner Fl 282 Kolibri, marketed today under the name K-Max, using the principle of the double two-bladed meshing rotor, which makes it possible to save on an anti-torque rotor.

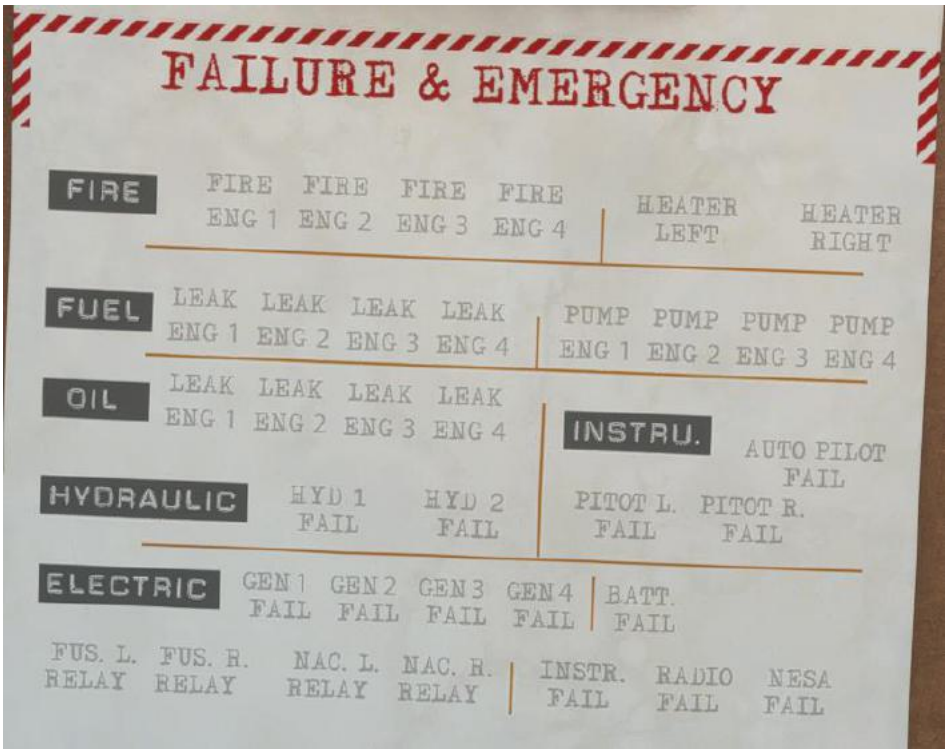
Flettner Fl 282 "Kolibri"

K-max

10. Failures

10.1 Instant failures

Upper part of the clipboard failure page creates instant failures: FIRE, FUEL, OIL, HYDRAULIC, INSTRUMENTS, or ELECTRIC



Use this for training and to create rapid action events for you to address.

10.2 External control damages

Fuselage can be damaged due to excessive overspeed or other conditions as follows:

Main wing limitations
- Negative 3 G @ 100 kts
- Positive 4.5 G @ 110 kts

Horizontal stabilizer over 105 kts (194 km/h)

Total wing destruction over 125 kts (231 km/h)

10.3 Gear damage

At touchdown several factors are analyzed to detect the quality and impact speed of the landing.
If the landing is too hard on one leg or if speed is over 60 kts, a tire will explode.

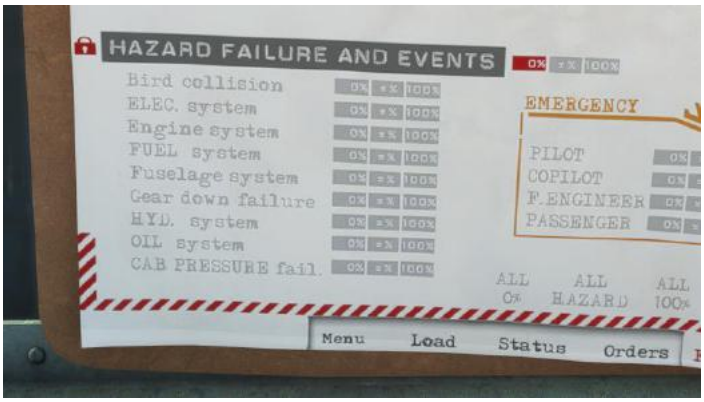
The damaged wheel will cause significant braking and prevent standard rolling characteristics significantly.

The MSFS crash concept is based on impact zones and joules.

If you land "softly" enough without hitting the fragile areas, the plane will not destroy itself.

10.4 Hazard failure and events NOT AVAILABLE IN THIS VERSION

The second part of the clipboard failure page generates random failures.
The delay is selectable from 0% (OFF), within 60min or within 5min.



At 0% no failure will occur. For other delays (60 min or 5 min) , you can activate/deactivate failures of your choice before random selection.

After 60 seconds, a random process selects one of the main failures and will enable the selected trouble within a random delay between 0 to 60 minutes or 0 to 5 minutes depending on your selection

It is possible to de-active all hazard failure or only some specific failures. Three scenario buttons (bottom right) can manage them; All 0% (Sets all to 0%), All Hazard (enables all set to random), or All 100% (sets to 100%),

Some main failures have specific activation characteristics. Others have sub-systems of failures.
There should not be more than one or two failures at same time, with the exception of a failure causing another failure. Like an electrical (generator) failure causing a fire on an engine.

10.5 Easy -Normal -Realism modes

Easy mode:

- by default, no hazard event – but user can add them
- All failures are displayed in the failure page and in the status page
- Easy mode can be change to normal or realistic mode even in flight
- External control visual failures (aileron, rudder, elevator) have no impact on flight characteristics

Normal mode:

- by default, no hazard event – but user can add them
- All failures are displayed in the failure page and in the status page
- Normal mode can be change to easy or realistic mode even in flight

Realistic mode:

- by default, hazard events are all selected – but user can modify them
- Realism mode can be modified to another mode only on ground.
- External control visual failures (aileron, rudder, elevator) have impact on flight characteristics

11. Career Mode NOT AVAILABLE IN THIS VERSION

11.1 Concept of the career mode.

This mode is more of a role play concept for MSFS.

If you want to further enhance the immersion in the game, we have created a career mode.

As soon as you switch to "realistic" mode, all settings are tracked are saved.

To validate a career mode, you have to fly in realistic mode for more than 30NM and validate a landing without killing the pilot.

11.2 Pilot's career.

You can choose between three different pilots to create a long and successful career with them.

Several parameters are recorded:

- Flight hours (in realistic mode)
- Freight transport totals (after landing)
- Transport mail totals (after landing)
- Mail recovered in flight (in realistic mode)
- Passengers transported (after landing)
- Total number of landings
- Happiness of passengers (in realistic mode)

The rewards will be in the form of REDWING points (RWG) and grades/ranks for the pilots.

Some rewards will be obtained by accumulating high achievements on missions
Prizes and gifts can be obtained and used to improve the planes or help in the life and career of the pilot(s).

RANK 1: Rookie

RANK 2: Second Officer

RANK 3: First Officer

RANK 4: Senior First Officer

RANK 5: Training Captain

RANK 6: Captain

The grades/ranks allow you to accumulate more RWG points (up to x2).

11.3 Pilot page.

1. Use left and right arrows for pilot selection

2. Button to erase all datas including career parameters

3. Button to revive a dead pilot

4. All datas parameters for a specific pilot

5. Redwing earned points to use on Airliner career page

6. Achievement area (W.I.P.)

7. Go to Airliner career page.

11.4 Achievements (W.I.P.)

There are many events where you can receive benefits.
Rewards can be visual, decorative or items that improve your aircraft.

This part of the document is awork in progress and may be changed over time.

11.5 Airliner career concept

You can choose between three different planes to create an ongoing and progressive career.
Your #1 plane will most likely be the primary plane, #2 is a secondary plane and #3 is a backup or training plane.

Several parameters are recorded in realistic mode only:

- Flight hours of each engine
- Damage for each engine
- Damage for each oil system
- Damage for each water system
- Damage for each gear and tire
- Damage for each propeller
- Damage for windshield

You will need specific kits loaded in the aircraft to repair the damaged elements outside the airfields.

Service, maintenance and parts exchange require the use of REDWING points.

Service, maintenance and exchange of parts required for the reconstruction of a destroyed aircraft will require many REDWING points. Which is why you need to be diligent in your flights/missions to fly within the specifications/limits and ensure adherence to required maintenance.

11.6 Airliner career page

1. Lists available tool kits, engine spares and/or propeller spares.

2. Use left and right arrows for plane selection

3. Status of the actual plane on apron.

4. Button to rebuilt a destroyed plane

5. Fuselage repair area

6. Windshield repair area

7. Left engine repair area

8. Right engine repair area

9. Gear & tire repair area

10. Left and Right Propeller repair area

11. Go to pilot's career page.

11.7 Repair concept

In career mode, you must take care of your plane.
You will have to clean it, maintain it and even repair it.

Many of these actions will cost REDWING points.

To earn points, you must be in career mode, fly in realistic mode for more than 30 minutes and make a landing on a runway without damaging g the plane or killing the pilot.

If during breakdowns, which are quite frequent on this aircraft type, you land in the countryside, you will have the opportunity to repair and leave to finally validate your points by landing safely at an airfield.

11.7.1 Repair kits

Repair kits are free of charge if they are shipped from a departure airfield parking lot.
Unfortunately, they can be heavy and even clutter up some passenger areas so be careful with weight and balance and passenger happiness.

TOOL KIT N°1:
Tools and spare parts to repair minor windshield damage, some fuselage damage as well as radiators and water hoses.

Stowes in the rear cargo area and takes one of six locations.
Weight: 333 lbs.

TOOL KIT N°2:
Spare wheel and spare parts box to repair gear, tires, hoses and fuel/oil systems.

Takes the place of the "E" passenger behind the cockpit
Weight: 170 lbs.

Engine spare KIT N°3:
Contains a replacement motor as well as the gantry to disassemble it and all the necessary tools.
The engine is stored in the rear cargo area and takes up two baggage slots.

The installation gantry is located above the passengers on the right

Engine weight: 666 lbs.
Gantry weight: 60 lbs. (20 lbs. on each seat F, H and J)

Propeller spare KIT N°4:
The propeller is stored above the passengers on the left
Propeller weight: 90 lbs. (30 lbs. on each seat E, G and I)

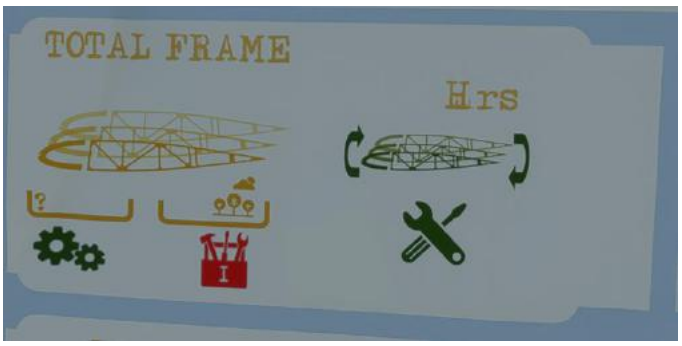
11.7.2 Plane status

This area describes the status of your aircraft. If it is on a parking lot or, for example, it is considered to be in the open country after a makeshift landing.

11.7.3 Rebuild plane

If your aircraft is completely destroyed or lost.
You can rebuild it and recover all its data by spending you earned REDWING points

11.7.4 Fuselage area



In this area the data of the fuselage and its number of hours of use appear.

At the bottom left, the gears indicate its general state

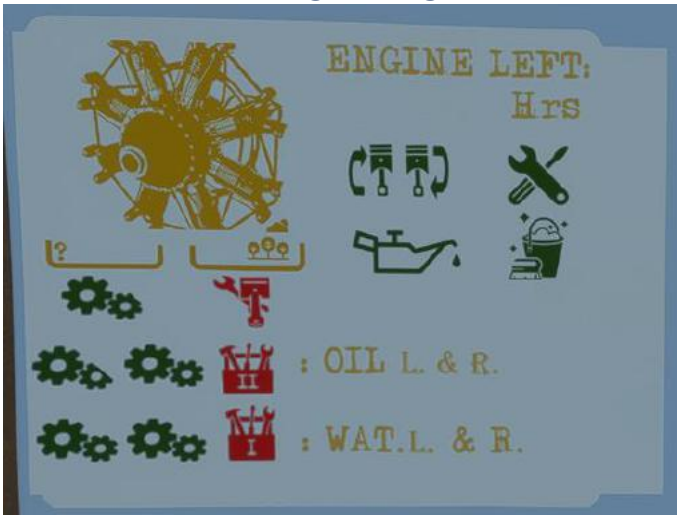
At the bottom middle you can see the kit to use to repair it out of the parking area of an airfield. RED/GREEN symbol will indicate if a kit is available or not.

On the bottom right a pictogram allows to repair the fuselage or to replace a part of it with kit N°1

11.7.5 Windshield area

In this area the data of the windshield is displayed.
At the bottom left, the gears indicate its general state.
At the bottom middle you can see the kit to use to repair it out of the parking area of an airfield.
RED/GREEN symbol will indicate if a kit is available or not.
On the bottom right a pictograms allows:
Replacing a windshield on the apron of an airfield, only.
Repair and/or replacement a glass with a KIT N°1.
Or Clean the windshield (on ground only)

11.7.6 Left and Right engine area



In this area the data of the Engine and its number of hours of use appear.

The life of a motor is 100 hours maximum.
The older and more damaged the engine, the greater the probability of failure or engine fire can completely destroy an engine.

At the bottom left, the gears indicate its general state and, lower right, the status of oil, fuel and water systems can be viewed.

At the top left you can see the kits to use to repair each part of the engine. RED/GREEN symbol will indicate if a kit is available or not. Repairs of this kind must occur in a parking area of an airfield.
On the upper right of the pictogram allows you to fully replace the engine, repair minor systems. In addition, you can refuel some systems with limited liquids (after a replacement) or clean the engine covers.

11.7.7 Gear and tire area

In this area the data of the Gears and tires are displayed.

Each take-off and landing causes more or less damage to the landing gear due to stress.

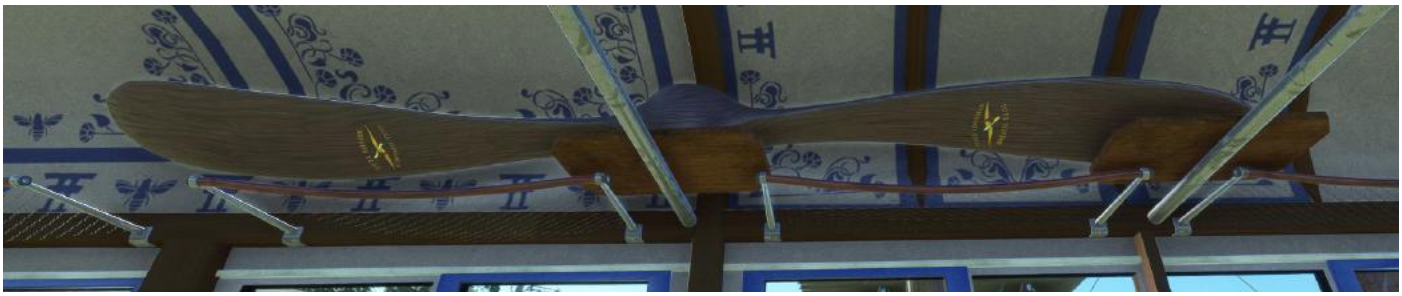
At the bottom left, the gears symbols indicate its general state of left and right landing gears.
At the top left, you can see the kits to available to use to repair gears RED/GREEN symbol will indicate if a kit is available or not. Repairs of this kind must occur in a parking lot

On the right side, a pictogram allows you to fully replace or repair a wheel and allows fora simple reinflate the wheels if necessary.

11.7.8 Propeller area

There can only be one spare propeller on board the F60 at a time.
If you repair one propeller the second one will not be available within the parking lot of an airfield.

The spare propeller can be loaded in the CG &LOAD menu.
It is placed above the head of the passengers and adds 30 lbs. on each loading slots G, H and I



The propellers of the Farman F60 are well protected by the cockpit structure. Nevertheless, we decided, in case of aground loop, to consider some damages that may not be not well simulated.

At the bottom left, the green gears indicate its general state of left and right propellers.
At the top left you can see the kits to use to repair a propeller. RED/GREEN symbol will indicate if a kit is available or not. Repairs of this kind must occur in a parking area of an airfield.

On the right a pictogram allows you to fully replace a propeller. If you are on apron, both propellers are changed and balanced.

12.LIVERIES

F-HMFU (passenger version)

The Farman F60 N°3 is the first aircraft sold to the "Compagnie des grands express aériens" (CGEA)
With its "almond green" color, it was assigned to the Paris-London route.

The CGEA company merged with the "Messageries Aériennes" to create AIR UNION in 1923. The plane is repainted in brown and gold then in a "Chamois and red" livery visible in game.
In 1921 it was named "Ile de France".
The Goliath F-HFU is retired& from service in 1932. Its fuselage is the only one still existing. It is exposed to the "Musée de l'Air et de l'Espace" in Paris.

F-GEAD (Cargo version)

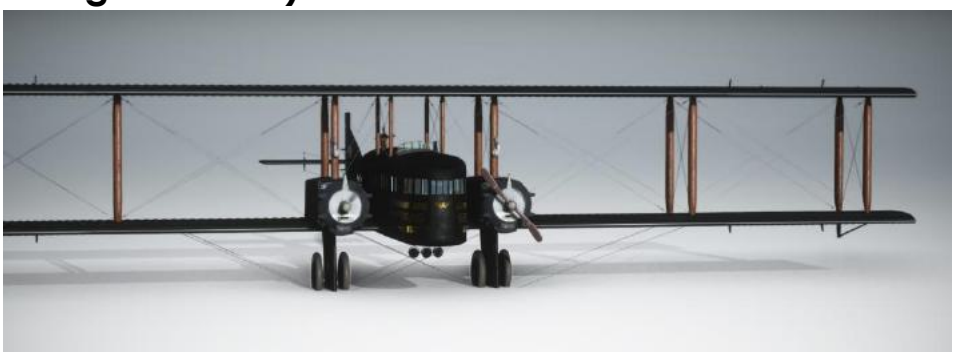
The Farman F60 n°5 is produced in 1919.
In the summer of 1920, a new regulation imposes to write the registration on a white background for a better readability and forbids the national cockades on the planes.

The aircraft in question wears the CGEA livery with simplified markings "Grands express aérien" for a horizon blue livery. It operated on the Paris-London route until 1923.

In 1923, it will take the AIR UNION livery and will be named "Savoie".

In 1929, it made a forced landing in the countryside loaded with £100,000 of gold bullion, then was repaired.
It was reformed in 1932

F-GRWG (passenger version)



The Farman F60 n°8 which left the factory in 1920 was originally registered F-GEAC.

The aircraft in play has an artistic REDWING livery and a fancy registration F-GRWG.

In its real life, the aircraft is transferred to AIR UNION in 1923.
In 1929, after a departure from London, the pilot had to land in emergency in a field which damaged his aircraft.
The mechanic will cut the upper wings, remove the front cabin too damaged and plug the holes with plywood, so that the plane takes off again for Le Bourget where it will be repaired.

The plane will be rebuilt at the end of 1932.

F-ADDT (passenger version)

The Farman F60 n°228 was christened "London" then "Languedoc" when it was transferred to the AIR UNION company in 1923.

In 1928, it left the Paris-London route for a new Paris-Lyon-Geneva route with a crossing of the Alps at 3000m (9000ft).

The plane is reformed in December 1932.

H-BMOG (passenger version)

This livery is a free inspiration of Farman F60 n°228 D-ADDT

No Farman has been registered in Switzerland but it could have looked like this version in game.

CUBA (passenger version)

The Farman F60 N°4 and 6 are bought by the "Compania Aérea Cubana".
They are delivered as well as 4 F40 in 1920 in order to cover an air and postal line between the USA and Cuba.

The aircraft initially kept their French registration.
The Goliath F-GEAB (which had another unknown registration), visible in the game, is named "Mariana" in honor of the wife of the President of the Republic of Cuba.

The pilots were initially French crews, later replaced by Americans.

The fall in sugar prices after the war caused the bankruptcy of the company in 1922. The Farman planes disappeared.

US-MAIL (Cargo version)

This imaginary livery is inspired by the aircraft of the company "US AIR MAIL" NC-45W

We imagined that the two aircraft that disappeared in Cuba would have been able to come back to life in the U.S.A. on air routes New-York -Washington -Malibu-Cuba.

The aircraft is a cargo version equipped with the system of recovery of mail in flight.
NC-45W