FOUGA MAGISTER CM170

version 1.1

Flight Simulator X -SP1
(FSX-SP1)

Fouga PAF on CORSE island (FranceVFR sceney)

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2D Panels and gauges : Jean-Pierre Langer

Flight dynamics : Jean-Pierre Bourgeois

Ground settings : Benoit Dubé

Textures : Marc Hardouin

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1- THE FOUGA MAGISTER AIRPLANE :

11- History:

The Fouga Magister CM170 is a two-place, twin-engines military jet aircraft trainer. It was developped from a cooperation between Mrs Robert Castello and Pierre Mauboussin, french ingeniors of Fouga company, for the airframe, and Mr Joseph Szydlowski, Turbomeca company's founder, for the jet engines.

The first flight has taken place on 1952 july 23 with Léon Bourrieau as test pilot. It was selected among 24 other aicrafts presented to the OTAN consultative group for the flight training. The production began in 1956 in France (successively by Fouga company, then Air Fouga, and by Potez, which finally became a part of Aerospatiale) and also by several nations (Germany, Finland, Israel....). At the end of the sixties, around a thousand aircrafts were produced.

The french Airforce was the main user of the Fouga Magister between 1956 and 1996 with about 400 aircrafts and two millions of fhight hours.

Thirty aircrafts of a naval version, called Fouga Zephyr CM175, were built for french Navy.

Up to 12000 pilotes were trained with the Fouga Magister around the world.

Several aerobatic teams have used the Fouga Magister, especially the french patrol "Patrouille de France" (PAF) between 1964 and 1980.

12- General charactéristics :

Special feature of the airframe include a 110° angle butterfly tail

Wingspan :	12,15 m
Lenth :	10,06 m
Height :	2,80 m

Marbore VI engines version (first airplanes had Marbore II engines with lower performances) :

Take off maximum mass :		2900 kg
Maximum thrust	(sea level) :	480daN (x2)
Maximum RPM :		21500 rpm
Maximum speed	:	400 Kts
Maximum Mach :		0.82

2- THE FLIGHT SIMULATOR MODEL :

The Fouga Magister CM170 is presented in 3 versions:
- the "lower serials numbers" version (cf N°62)
- the "higher serial numbers" version (cf N°412) , with remarkable "whiskers" (VOR antennas).
This variant include a "dual control" (DC) model which can be piloted from the rear seat.
- the "Patrouille de France" (PAF) version, in his 1966 paint scheme.

As a simplification, all models use MarboreVI engines, so they have same performances. In fact, the lower serial number aircrafts were equiped with less powerful engines (MarboreII).
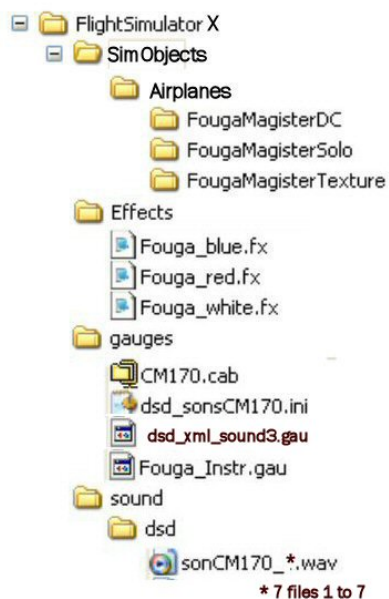*Besides, several differences between the real airplane and models were intoduced to make its use easier for the virtual pilot :*
- the nose gear wheel is steerable while the real Fouga was driven on ground whith toes brakes
- a GPS, a DME and an automatic pilot are introduced in the model
- several supplementary lights are placed on the panel to ease virtual flying (flaps,landing gear, airbrakes)

Flight Simulator X (FSX) installation :

- unzip the archive file in a temporary folder
- place the contents of the different folders in the related FSX folders so as to obtain the configuration illustrated below:

WARNING: this model is not compatible with FSX-SP2 version

- don't modify folders names

- in FSX selection screen, the Fouga Magister is placed under "Potez-AirFouga" "manufacturer's" list
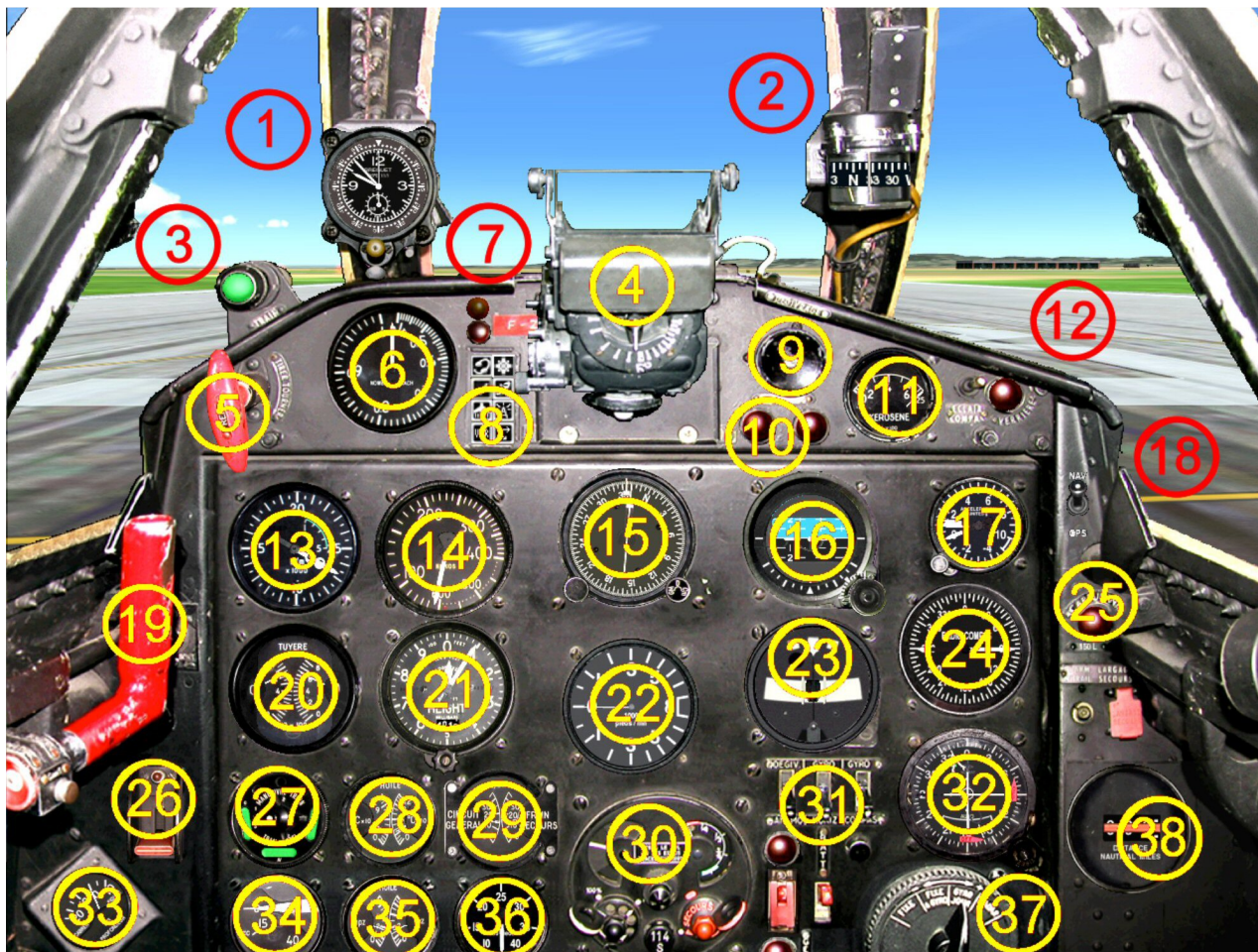
The model does not include any specific sound folder (by default, the FS sound Lear45 is used). I strongly recommend to use Fouga sound effects from Mike Hambly (avaliable in the Fouga package "foufinn1.zip" designed by Kari Virtanen and Miko Maliniemi) (*)

(*) this package is available on major simulation sites (flightsim.com avsim.com simviation.com.......)

3 - COMMANDS AND EQUIPMENTS:

31 - Forward instruments panel (solo or PAF model - panel2D or virtual cockpit mode) :

1- Clock
2 - Compass
3 - Landing gear position indicator (*)
4 - Gunsight (clic for open/close)
5 - Parking brakes
6 - Machmeter
7 - Flaps and airbrake lights (*)
8 - Simicons (*) (**)
9 - Clic here for PA display/hide (*) (***)
10 - Engines fire warning
11 - Fuel tanks gauge
12 - Canopy unlock warning
13 - Engines tachymeter
14 - Airspeed indicator
15 - Gyro compass
16 - Attitude indicator
17 - G meter
18 - NAV-GPS switch (*)
19 - Canopy lock/unlock/ejection lever (****)

20 - Exhaust temperatures (EGTor T4)
21 - Altimeter
22 - Vertical speed indicator
23 - Turn indicator
24 - ADF indicator
25 - Low level fuel warning or low pressure warning
26 - Landing gear lever
27 - Landing gear lights
28 - Engines oil temperature
29 - Hydraulic pressures
30 - Oxygen regulator (**)
31 - Electric panel (***)
32 - VOR/ILS indicator
33 - Trimtab pitch indicator
34 - Flaps position indicator
35 - Engines oil pressure
36 - Cabin altitude pressure
37 - Gunsight selector (**)
38 - DME (*)

(****) WARNING ! Take off with unlocked canopy causes its ejection
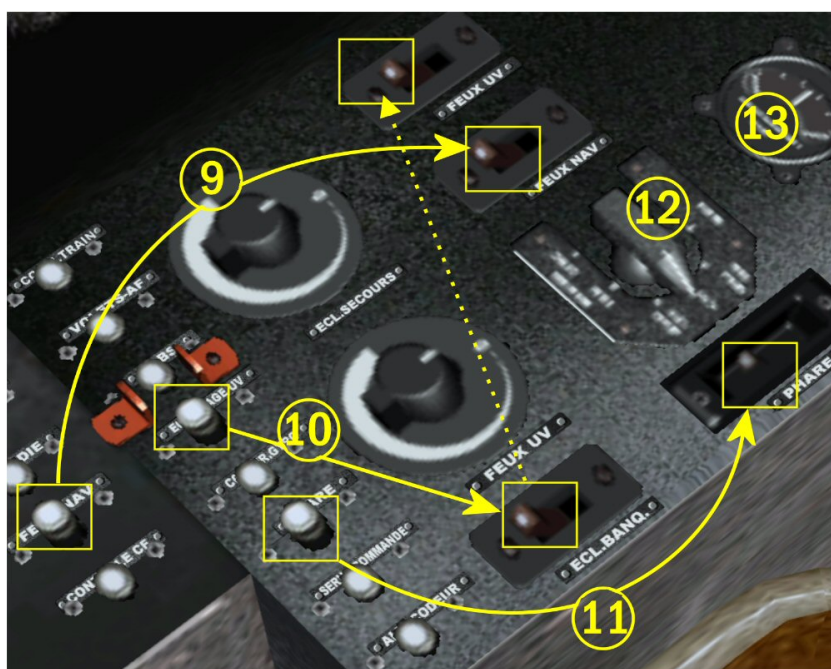
(*) model specific
(**) non functional
(***) for details see below

32 - Left console (solo or PAF model - virtual cockpit mode) :

1 - Canopy lock/unlock lever (**)

2 - Clic here for open/close the canopy (**)

3 - Throttle levers

4 - Flaps switch

5 - Fuel shut-off lever

6 - Throttle torque setting (*)

7 - Normal/emergency gear selector (*)

8 - Emergengy brake selector (*)

9 - NAV lights switch

10 - Panel and consoles lights switch

11 - Landing/taxi light switch

12 - Air conditioning selector (*)

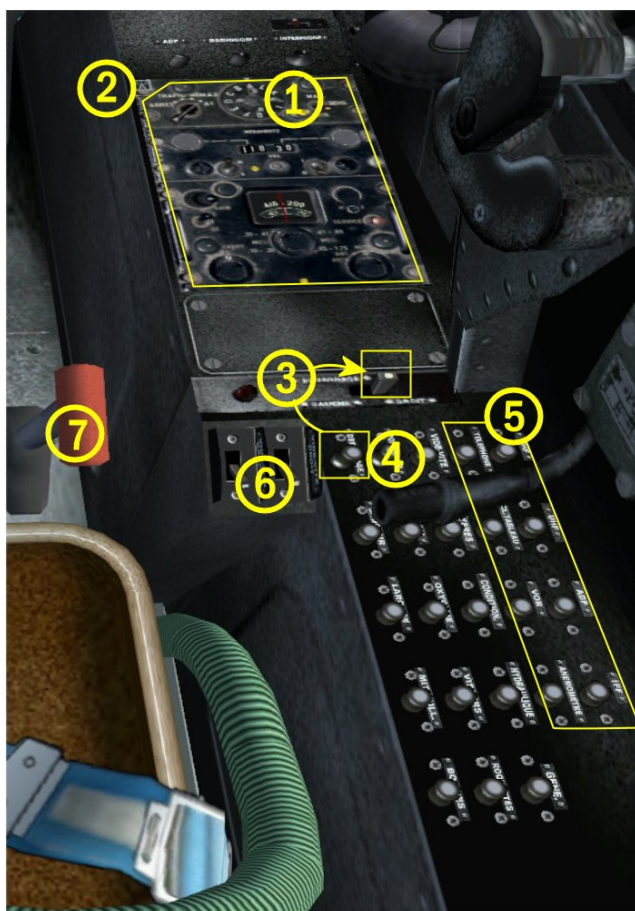13 - Air conditioning indicator (*)

(*) unfunctional

(**) canopy lock is possible only when closed
    opening canopy is possible only when unlocked

Breakers which are not named are non functional. They remain in ON position

WARNING !
1- Don't use "L" shorcut to turn all the lights ON or OFF ! You will activate smoke sytem. Use each switch light
2- Don't use "MAJ+E" or "MAJ+E+2" to move the canopy. It will affect sound effects synchronisation. Use VC commands

33 - Right console (solo or PAF model - virtual cockpit mode) :

1 - Radios (except IFF/Transpondeur)
For a better reading, it is preferable to open the radios window (simicon 2 or radios simicon on the principal panel)
2 - Radios simicon
3 - Starter (breaker + selector right/left)
4 - Fuel pump
5 - Radios and instruments breakers
6 - Dump valves switches (*)
7 - Manual emergency pump (*)

(*) non functional

34 - Forward central console (solo or PAF models - virtual cockpit mode) :

1 - IFF/Transpondeur (cf radios panel for details)
2 - Pedals position adjuster (*)
3 - Voltmeter

(*) non functional

35 - Rear cockpit (DC model only - virtual cockpit mode) :

The rear seat cockpit, only visible with DC model and virtual cockpit mode, has the major part of the controls and intruments of the front seat cockpit. On the real airplane however, not all the commands are avaliable from the rear seat and the flight control requires front pilot actions. To make possible a complete flight from the rear seat in the model, a "pop up window" is avaliable with essential controls and intruments. Clic on a shoulder of the front pilot active or desactive this view.

Because of a reduced visibility, the rear seat cockpit of the Fouga is equiped with a periscope. Use F10 shortcut to activate the periscope view and on the bottom of this view to return to the previous view (or FS9).
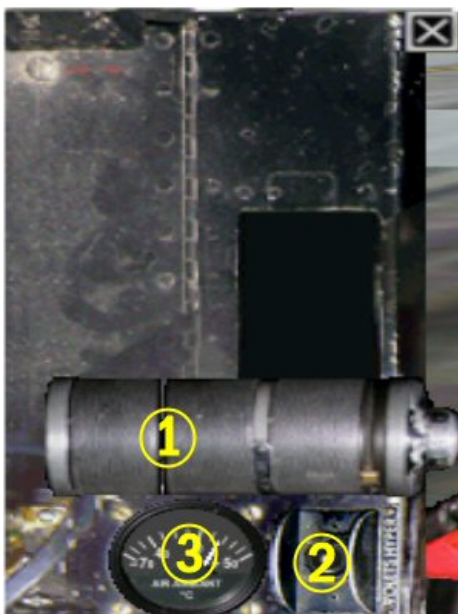
36 - Others windows (all models) :

- Other windows selection simicons :

1 - ATC window
2 - Map
3 - Tablet
4 - GPS (*)
5 - Left console
6 - Radios
7 - VFR/IFR view selection (**)
8 - Landing view (**)

(*) model specific
(**) 2D panel only

- Left console :

1 - Throttle levers

2 - Exterior temperature (*)

3 - Flaps switch

(*) model specific

- Radios panel :

1 - ON/OFF switch

COM
   2 - Frequency setting
       Left clic   +/- 25Khz
       Right clic +/- 1Mhz
   3 - Selected frequency display (3 seconds)

NAV
   4 - Frequency setting +/- 1Mhz
   5 - Frequency setting +/- 25 Khz
   6 - Tune switch

ADF
   7 - Band selector
   8 - Frequency setting
   9 - Selected frequency display (3 seconds)
  10- Tune switch

IFF/Transpondeur
   11 - Code setting +/- 1000
   12 - Code setting +/- 100
   13 - Code setting +/- 10
   14 - Code setting +/- 1

- Automatic pilot :

     The Fouga had no automatic pilot. This option is added to keep model's use more easy.
To see the autopilot window:
   - solo model: look at "forward intruments panel" (page5)   number 9
   - DC model: on the panel, clic on "dégivrage" (de-icing button in the real plane)

1 - ON/OFF switch
2 - Altitude control
3 - VOR navigation control
4 - Heading control
5 - Yaw damper
6 - Heading setting +/-
7 - Radial setting   +/-

- Smoke system (PAF model only) :

The PAF Fouga was equipped with a two colors smoke system:
- a white one
- a color smoke (blue or red according to the configuration loaded)
The model has the white smoke and, initially, the red one. You can replace the red by the blue smoke in the "aircraft.cfg" file of "FougaMagisterSolo". First make a security copy of this file. Then open "aircraft.cfg" (with notepad) and go to the [lights] section. You can see two lines named "ligh.5=....". The line preceded by a double slash // is passive. So you can choose the color active (blue=fumigène bleu or red=fumigène rouge) by placing the // in front of the color you don't want. Register to save the modifications.

1 - White/color selection switches
2 - ON/OFF switch
3 - Smoke active signs

37 - Camera views:

Several camera views are available in VC mode and in spot view mode through the contextual menu accessible by clicking on a free zone of the screen.
In VC mode, these views are made to keep more easy the access to various parts of the cockpit.

4- REFERENCES :

41- Bibliography :

"Le Fouga sous toutes ses couleurs "
By Ltcl Jean-Loup Rambeau, Eric Moreau and Patrick Audouin (ADDIM editor)
(in french)
http://d520.online.fr/livres/fouga/accueil.html

A superb book, remarkably informed, very valuable for the desgn of this model

42 - Internet links :

- Fouga's informations :

You can found a multitude of informations about the Fouga on the net. A great part of the elements used to realize the model come from numerous excellent sites, in particular:

AirFouga   http://air.fouga.free.fr/

Fouga's restoration and a quantity of informations about this plane   http://www.fouga.net/

Jets for ever   http://perso.orange.fr/jets.for.ever/

Friens of "5° Escadre" (French Airforce unit)   http://www.musee-a5e.com/

"Conservatoire de l'Air et de l'Espace d'Aquitaine " (the preservation and promotion of our aeronautic and space heritage)   http://caea.free.fr/index.html

- also :

- " Traditions des escadrilles de l'Armée de l'Air" a remarkable work to collect and structure informations about the French Airforce units. The webmaster of this internet site, Henri Guyot, contribute geatly to this Fouga's modeling and flight dynamics parameters settings
http://perso.orange.fr/airtraditions/

- Virtua-Aerodesign, the Marc Hardouin's site. Marc Hardouin is the creator of this model's textures. You can found on this site many other textures for the Fouga and also for a lot of other aicrafts.

http://virtua-aerodesign.net/

5 - THANKS :

First, I thank the members of the Restauravia team which contribute to this work, particularly:
- Jean-Pierre Langer for his major work about the panels and gauges
- Marc Hardouin which realize the textures of this package and offer many other ones (http://virtua-aerodesign.net/)
- Jean-Pierre Bougeois and Benoit Dubé which set the flight dynamics model and on ground stting, so that it work as a real Fouga ,

and also all persons which give me informations and documents about the Fouga airplane.

A special thank to Henri Guyot, a former Fouga Magister's instructor-pilot, which spontaneously offered his help and contribute with enthusiasm to the settings and the flight tests of this model. His substantial experience of the Fouga was a real advantage for us .

6 - LEGAL MENTIONS :

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