Version for Microsoft Flight Simulator, MSFS24

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1. THE PROJECT

Our goal is to bring the rich history of SWISS MILITARY AVIATION back to life using flight simulators. The participants in this adventure are united by their passion and knowledge of flight simulators and the technical and aeronautical adventure that has been the evolution of aircraft defending Swiss airspace.

Museums such as the Musée Clin d'Ailes in Payerne, the Military Aviation and Air Defense Museum in Dübendorf, and the Aviation Museum Altenrhein are full of old aircraft and objects as well as archival documents. However, these items remain static and can only be observed from near or far. Our goal is to bring these objects to life in a more interactive way through specific developments for flight simulators on the market. Although many people consider these simulators to be a game, they allow us to bring aircraft, airfields, and the flight and navigation techniques of the era back to life.

Chance brought together former military pilots with heads full of memories, former air force technicians, and aviation enthusiasts with a passion for computers. Little by little, ideas took shape and our group of enthusiasts set to work...

The arrival of Microsoft Flight Simulator in 2024 allows us to achieve our goals with maximum realism thanks to the quality of the scenes and the 3D modeling of the interior and exterior of the aircraft. This manual describes our fourth project, the Hawker Hunter Mk. 58 version used by the Swiss Air Force from 1958 to 1994. For our creation of the Swiss Hunter MK 58, we benefited from the expertise of two specialists:

Benedikt von Arx, a military pilot who flew the Hunter from 1979 to 1994.

Éric Sommer: Swiss Air Force technician who was a specialist in Hunter maintenance.

He follows our previous creations:

Available on the MSFS Marketplace and from SimMarket:

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2. Genesis of the Hawker Hunter

The Hunter benefited from the technological advances of the 1950s, the most important of which were:

- **The transition from radial compressor engines to axial compressor engines**, which improved the thrust-to-weight ratio (Venom engine: De Havilland Ghost weighing 1,000 kg, thrust 2,200 kg, or 2.2 kg per kg of weight; Hunter Rolls-Royce Avon engine weighing 1,310 kg with a thrust of 4,580 kg, or 3.4 kg of thrust per kg of weight) but also a significantly smaller frontal area (Ghost 1,346 mm, Avon 907 mm)

- The 35° **swept wing**, which offers a combination of advantages in terms of speed, maneuverability, and stability, making it very well suited to a transonic fighter aircraft!

- The **horizontal plane of the movable elevator** (precursor to the monobloc elevator) allows transonic flight by reducing compressibility effects.

The Hunter is capable of supersonic dive flight. On September 7, 1953, Deville Duke set a world speed record of 1,171 km/h with a Hunter.

The Hunter made its first flight in 1951 and entered service in 1954. A total of 1,972 aircraft were built in 15 versions, and it was highly appreciated by pilots for its great maneuverability and robustness. It was used by some 20 countries, first as a fighter, then as a fighter-bomber and for reconnaissance. The two-seater version was particularly popular for training. The Hunter was part of the most famous aerobatic team: the Black Arrows. It was withdrawn from service by the last country to use it (Lebanon) in 2014. A few Hunters still fly in civilian versions.

In 2025, there are still 72 Hunters in flying condition worldwide. They are operated commercially, but often serve as target aircraft for air forces, for example in England, Canada, and the United States.

In addition, 47 Hunters are on display in various museums around the world.

Comparable aircraft: Dassault Mystère IV, F-86 Sabre, Mikoyan Mig-17.

Complete history: Hawker Hunter — Wikipedia (wikipedia.org)

"The Men Who Flew the Hawker Hunter" Martin W. Bowman (Amazon)

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3. The Hunter in Switzerland

On January 29, 1958, Parliament approved the purchase of 100 Hunters, and on April 12, 1958, the first aircraft arrived in Switzerland. These were Mk 6 Hunters, which were later converted to MK 58s, a version specially adapted to Swiss requirements.

These aircraft are equipped with four 30 mm cannons and can be fitted with AIM 9 Sidewinder air-to-air missiles, as well as various bombs and unguided missiles.

One hundred Hunters were initially purchased in 1958 for CHF 313 million. Subsequently (1972-76), used Hunters, factory-refurbished and reassembled in Switzerland, were purchased in two series of 30 units,

including eight two-seaters, for a total of 160 aircraft. In the 1980s, the Hunter's weaponry was modernized and also adapted for electronic warfare. Our Hunter is compliant with this version.

The Hunters served for 36 years and were withdrawn from service in 1994.

Thirty Hunters remained in Switzerland, some of which were donated to museums, others to associations that kept them airworthy for as long as possible, and finally some were displayed at airfields and barracks.

A Hunter demonstration team called "La Patrouille Suisse" was created in 1964 for the National Exhibition in Lausanne.

Operational service: The Hawker Hunter served for several decades in the Swiss Air Force, participating in air defense, surveillance, and interception missions. From 1979 onwards, it took over the ground attack duties of the DH-112 Venom.

Modernization and withdrawal: Over the years, aviation technology evolved, and the Hawker Hunter became obsolete as a primary fighter aircraft. In the 1990s, Switzerland gradually withdrew the Hawker Hunter from active service, replacing it with more modern aircraft.

Legacy: Although retired from active service, the Hawker Hunter remains an icon in Swiss aviation history. Its decades of loyal service helped strengthen the country's air defense and marked an important period in the evolution of the Swiss Air Force.

It should be noted that the Hunter competed in Switzerland with the FFA P-16, whose development was abandoned.

Interesting books on the Hunter in Switzerland:

"Hunter- ein jäger für die Schweiz," authors: Olivier Borgeaud, Peter Gunti, Peter Lewis, sold by Olivier Borgeaud, Studenweg 12, CH-4852 Rothrist. mirage@swissonline.ch

Hunter Fascination: Amazon.com: Hunter fascination: 9783952090602: DONNET, Christophe: Books

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4. Quick start guide

For Xbox users, a mouse is essential in order to take full advantage of our aircraft's features in MSFS2024.

Tips from an experienced Hunter pilot:

Ground takeoff

If you are starting on the tarmac, use the checklist built into **the EFB**.
The engine can be started via the checklist or with **Ctrl+E**, but you will then need to manually check and adjust all instruments and systems.

Takeoff from the runway

Turn on the **pitot heater** and set the **gyro** to the runway heading.
The easiest method is to use the **D** key (assigned to "SET HEADING INDICATOR").

Taxiing

Taxiing requires a little finesse: use **differential braking** and apply the **rudder pedals** lightly**.**

Takeoff configuration

- **Flaps 2**: normal takeoff with a "clean" aircraft or internal tanks only.
- **Flaps 4**: if 4 swing tanks are installed.

Don't forget to **close the canopy**.

On the Runway:

- Stabilize at **6800 rpm**
- Release the brakes
- Apply **full throttle**
  → If you are the leader in formation: use **7700 rpm (yellow zone).**

At **220 km/h (120 kts),** pull gently until you reach approximately **8° ANU**.
Take off at approximately **280 km/h (150 kts).**
Retract **landing gear** and **flaps.**

Allow the aircraft to accelerate to at least **400 km/h (215 kts)** for the best **angle of climb**.
Up to **Mach 0.8,** the climb rate increases but **the angle** decreases.

Flaps, landing gear, air brakes

Flap speed limits:

- Flaps 1: **800 km/h (430 kts)**
- Flaps 3: **550 km/h (300 kts)**
- Full flaps: **460 km/h (250 kts)**

The flaps will not be damaged if they are extended above these speeds: the pressure will simply push them back.

The **Patrouille Suisse** always flew with **flaps 1**.

- Landing gear: **460 km/h (250 kts)** max
- Air brakes: usable at **all speeds**
  → Retracts automatically when the landing gear is extended.

Flight performance

- Mach **0.92** level flight
- Supersonic in **slight descent**
- Faithful to the real Hunter (tested by SwissMilSim)

Maximum loads:

- **+7.5 g**
- **–3.75 g**

Formation flights are very stable with a little practice.

Engine limits

- **Full power (red)**: max **3 min**
- **Climb power 7700 rpm (yellow)**: max **15 min**
- **Cruise 7500 rpm (white)**: unlimited
- **Inverted flight:** max **15** s (shuts down after 35 s)

Artificial horizons

As in the original, the neutral position of the artificial horizons shifts in the event of significant acceleration.
It is automatically corrected slowly in the event of low acceleration.
However, the horizons can be manually adjusted during flight, as before flight.

Approach and landing

In tailwind conditions, aim for **460 km/h (white mark)** or less.
Set flaps to 1 or 2.
Standard Swiss circuit altitude: **1300 m/ground (4300 ft/ground).**

At the end of the tailwind:

- Lower the **landing gear**
- **Full** flaps
- Begin descent immediately

On final approach:

- Slowly reduce speed to **300 km/h (160 kts)** (yellow zone)
- **6000 rpm** recommended

- Minimum **4500 rpm** (slow engine response)

At **50 m/ground**, **idle** and make a normal flare.

Keep the nose up to brake naturally, then lower it about halfway down the runway and brake.

Taxi to the parking area and shut down the engine according to the EFB checklist.

You can also find tutorial videos directly on our YouTube channel by clicking HERE

5. Technical description

a) Model versions

4 configurations are available:

Without additional tanks (FLUNTS)

With two additional internal tanks

With four additional internal and external tanks

A special "PAPYRUS" version Papyrus-Hunter - Hunterverein Obersimmental with additional internal tanks

b) Liveries

4 standard liveries: J-4001/4038/4061/4078, with a choice of with or without additional internal and/or external tanks.
1 PAPYRUS livery with additional internal tanks.

4 Patrouille Suisse liveries with or without additional internal and/or external fuel tanks.
2 RAF Hunter liveries: with or without additional internal or external fuel tanks:

RAF Blue Diamonds Hunter
4 registrations

RAF Hunter XG
4 registrations

The cockpit retains the MK58 Swiss model design.

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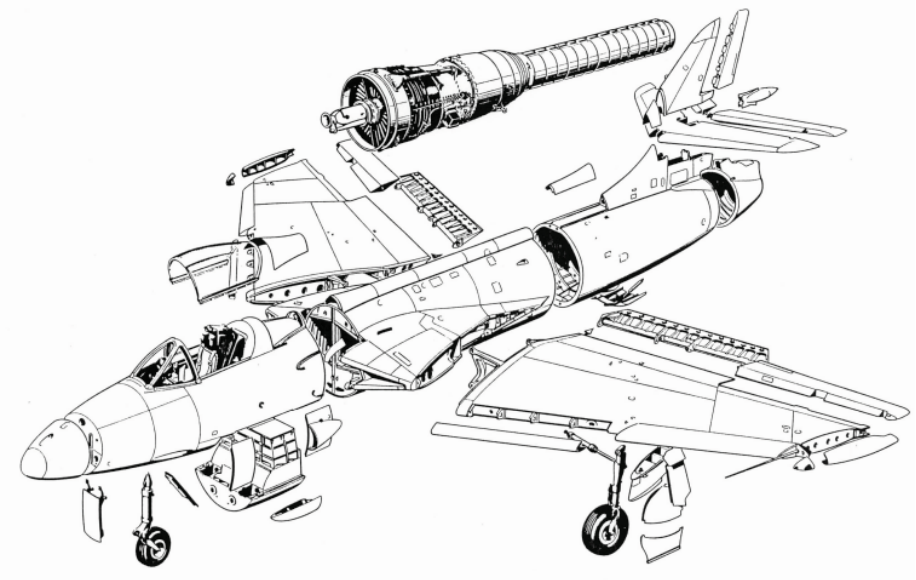
6. ESSENTIAL ELEMENTS

a) Dimensions, details of airframe, landing gear, flaps, air brakes, canopy:

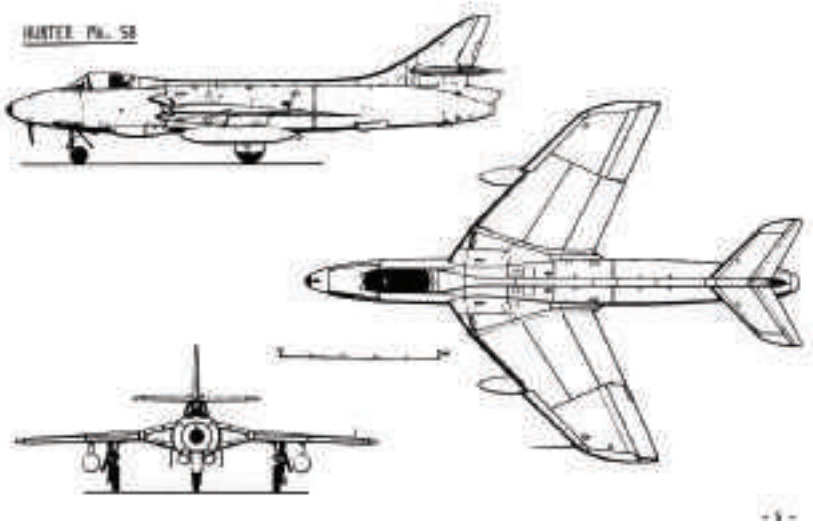
The HUNTER aircraft is a mid-wing, unsupported swept-wing aircraft with a swept tailplane; it is equipped with a main landing gear and a retractable nose wheel.
The thickness of the wing profile is 8.5%. The wing has a sweep of 40° at 25% of the chord. The wing tips (40%) are extended forward by 8% relative to the depth of the local profile. They are also curved downward (sawtooth). The resulting reduction in relative thickness delays the formation of shock waves on the upper surface at high speeds, while the curved section allows for better pressure distribution at high angles of attack. This process significantly reduces the tendency of swept-wing aircraft to "pitch up" during turns. The sawtooth leading edge has virtually the same function as a boundary layer separator.
The ailerons make up 40% of the trailing edge and are equipped with hydraulic servo control.
The landing flaps are mounted between the fuselage and the ailerons.

The fuselage consists of three main parts. The front section, with its synthetic radome, houses the telemetric radar antenna, VHF and UHF radio transceiver equipment, the nose wheel, the cockpit, and the gun cradle. At the front tip of the fuselage, there is an opening for the movie camera. The cockpit is pressurized and air-conditioned and is equipped with a MARTIN BAKER ejection seat. The front and sides of the cockpit are armored.
The second part of the fuselage consists of the integral wing root with air intake ducts and the mounted jet engine.
To change the engine, the rear fuselage is separated at the wing



trailing edge. The air brake is mounted under the ventral part of the rear fuselage.
The conventional swept tailplane is cantilevered. The elevator is equipped with a servo control. To improve the aircraft's handling around the pitch axis at transonic speeds, an electrical system automatically actuates the fixed plane according to the elevator deflection.
All controls are equipped with rigid linkages. The rudder and left aileron are equipped with trim tabs that are electrically controlled from the cockpit.

Propulsion is provided by a ROLLS-ROYCE AVON-203/207 turbojet engine with a static thrust of 4544 kp or 4580 daN.
The various fuel tanks are filled through a single connection located in the left landing gear bay.
The standard armament consists of four 30mm 58 caliber cannons (ADEN Mk 4 Hv) housed under the forward fuselage. The gun cradle containing the ammunition is interchangeable. The sight located in the upper center of the instrument panel is manually operated.
The pylons attached under the wings allow for the carriage of external loads such as rockets, guided missiles, bombs, and drop tanks.



	HUNTER Mk 58
Wingspan	10.24 m
Tailplane span	3.60 m
Overall length	13.95 m
Overall height	3.99 m
Wheelbase	4.50 m
Wing area	32.42 m
Wing sweep	40°
Maximum wing loading	350 kp/m2
Empty weight	6,760 kg 1)
Maximum takeoff weight	11,340 kg
Maximum Va speed at sea level without external loads	1,150 km/h or M 0.94
Maximum ceiling	16,300 m

Maximum speed	From a technical standpoint, there is no limit to the maximum speed in a dive.

1) According to modeling 6,240 kg.

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b) Configuration of the 4 versions

Configuration 1 = with 4 pylons, no external load

		kg	lb
Airframe	Without fuel	6,240	13,756.8
	Driver	85	187
	Pylons	102	224
	Cannons	375	826
	Shells	270	595
	TOTAL excluding fuel	**7,072**	**15,588.8**
Fuel	Fixed tanks 1,780 l	1,429.05*	3,150.5
Total		**8,501.05**	**18,793.3**

Configuration 2= with 4 pylons, additional interior tanks

		kg	lb
Airframe	Without fuel	6,240	13,756.8
	Driver	85	187
	Pylons	102	225
	FLUNTS interior 2 x 73 kg	146	322
	Cannons	375	826
	Shells	270	595
	TOTAL excluding fuel	**7,218**	**15,913**
Fuel	Fixed tanks 1,780 l	1,429.05	3,151
	FLUNTS 150 Gal 2x675 l = 1,350 l	1,083.84	2,389.4
Total		**9,730.89**	**21,452.9**

Configuration No. 3 = with pylons, additional interior and exterior tanks

		kg	lb
Airframe	Without fuel	6,240	13,756.8
	Driver	85	187
	Pylons	102	225
	FLUNTS interior 2 x 73 kg	146	322
	FLUNTS exterior 2 x 44 kg	88	194
	Cannons	375	826

	Shells	270	595
	TOTAL excluding fuel	**7,306**	**16,106.9**
Fuel	Fixed tanks 1,780 l	1,429.05	3,151
	FLUNTS 150 Gal 2x675 l = 1,350 l	1,083.84	2,389.4
	Total with empty external FLUNTS	9,818.89	21,646.9
	FLUNTS 100 GAL = 2x454.5 l = 910 l	730.58	1,610.65
Total		**10,549.47**	**23,257.6**

* By weight: MSFS conversion rate 1 liter = 0.80284 kg. In the manual, the liter/kg conversion is done using a factor of 0.79. MSFS imposes slightly different weights, but the fuel volume in the manual = 1 kg = 2.2 lbs 1 lbs = 0.4535 kg

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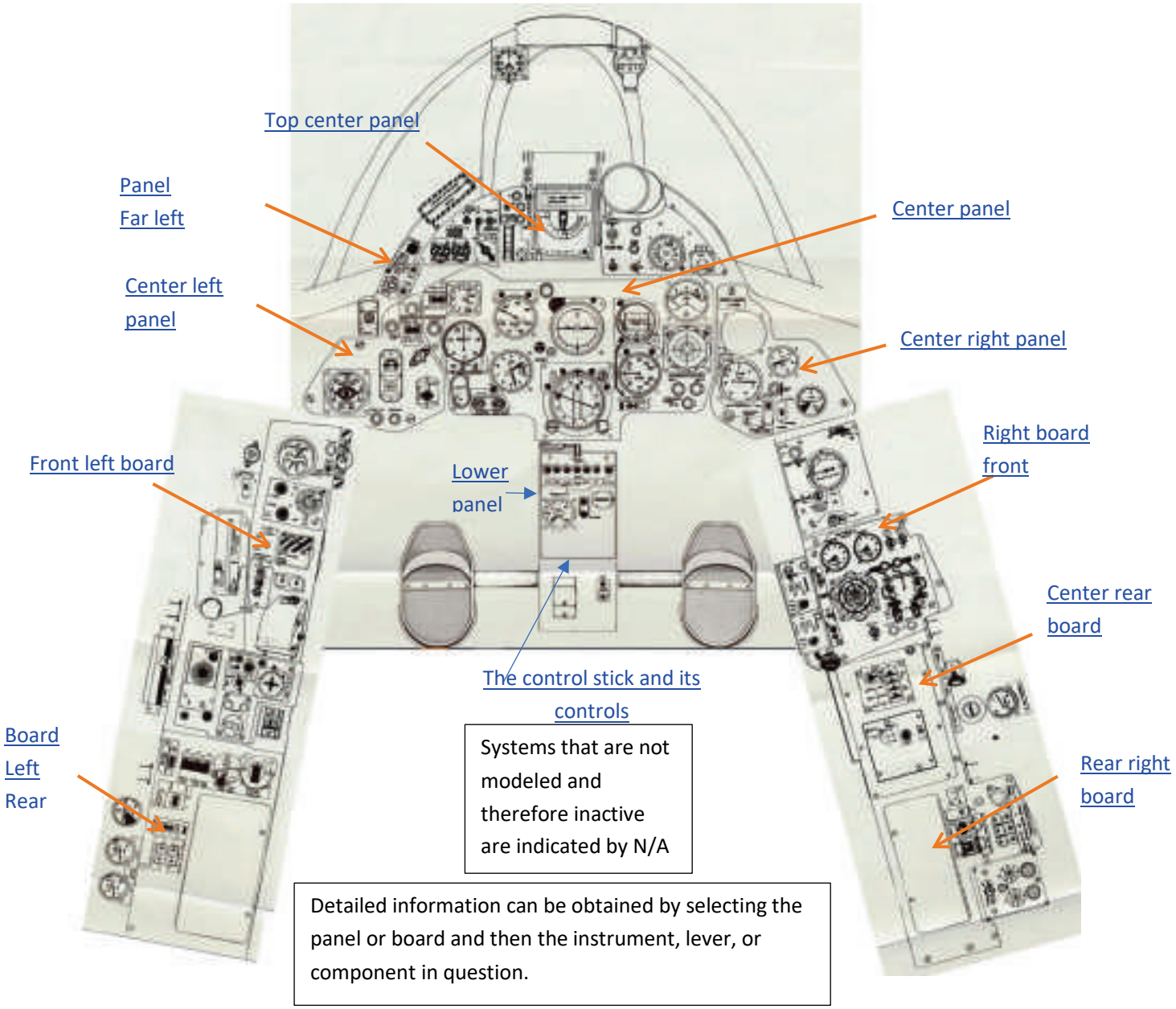
7. THE COCKPIT, instruments, and controls



Systems that are not modeled and therefore inactive are indicated by N/A

Detailed information can be obtained by selecting the panel or board and then the instrument, lever, or component in question.

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The cockpit model faithfully reproduces the cockpit of the Hunter MK58 on display at the Clin d'Ailes Museum in Payerne, an aircraft that has flown hundreds of hours and therefore shows obvious signs of wear and tear. The pilot had to get used to it!

a. The center panel:

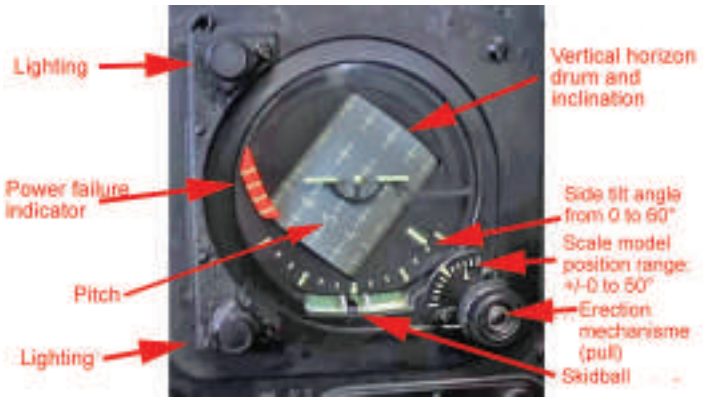
1) Artificial horizons:

 not activated	 enabled

The Hunter has two artificial horizons, SPERRY on the left and SFENA on the right, which is more accurate and used for IFR flights.

Special features of the SFENA gyroscopic horizon: the aircraft is represented in the center of the instrument window by a fixed symbol placed in front of the horizon drum. The numbers 1, 2, 3, 4, etc. on the drum indicate the pitch angle (graduated in degrees x 10) of the aircraft relative to the actual horizon (nose up (+++) or nose down (---)).

The lateral inclination of the aircraft is represented by a roll index that moves in front of the fixed graduations at the bottom of the instrument. Markings every 10° up to 60°.



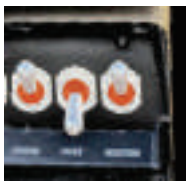
A bubble level indicates if the aircraft is skidding and allows the aircraft to be balanced before dropping weapons or firing cannons.

Both horizons are activated when the switch bar is engaged, and they stabilize in the horizontal flight position within a few minutes. This stabilization can be accelerated using the buttons: lower left for the standard artificial horizon, text: FAST ERECTION PUSH, LEVEL FLIGHT ONLY. For the SFENA horizon: lower right button without text, but also for adjusting the height of the model from 0° to +50° and -50° with 10° markings. The pilot can thus adjust the angle of aim.

At the bottom of the center panel, a switch activates an emergency ignition: "ALIM HORIZ. SEC. NORMAL/EMERGENCY. N/O

2) Speed and Mach indicator:

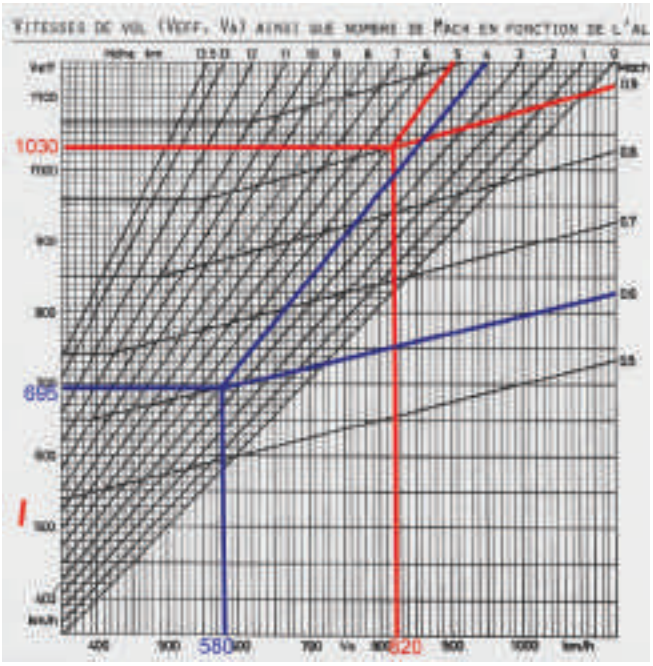
Speed indicator: in km/h
red/white line = minimum speed
Yellow line = recommended final approach speed
White line = maximum speed for landing gear extension and minimum speed for turns, gliding speed in case of engine failure.
The pitot tube located at the end of the wing transmits dynamic pressure to the speed indicator. The pitot tube is equipped with a heating system that prevents icing and thus interruption of pressure transmission; in the event of icing, the speed drops to "0." The pitot tube heater is activated by the dedicated switch on the switch bar, the only one that is not automatically activated with the switch bar. It is activated before takeoff only to prevent overheating on the ground.



Mach meter:

Text:	Mach	3000m/M	= 0.86
	Mach	7500	= 0.89
		12,000	= 0.92
	With external pylon loads		

= with load on the outer pylons.



Actual and indicated airspeed and Mach number according to flight altitude.

Example:
Mach 0.9 = altitude 5,000 m/M, actual speed/Veff 1,030 km/h indicated speed Va = 820 km/h

Mach 0.6 = altitude 4,000 m/M, Veff 695 km/h, Va 580 km/h.

See the performance section

3) Altimeter and variometer:

Altimeter in km Variometer in m/sec

When started up, the altimeter displays the altitude of the airfield at the atmospheric pressure set in the "Weather"/Pressure MSL window. This pressure can also be set using the lower left button on the altimeter. The standard atmospheric pressure is 1013 mb.

4) The gyrosyn:

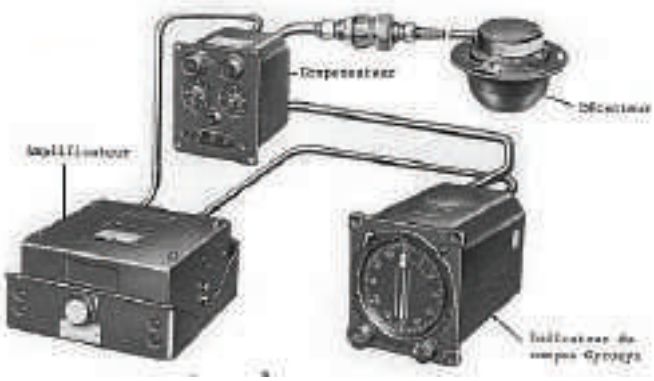
Main navigation instrument:

When the heading is set correctly, the correct setting indicator alternates between o and x.

The correct heading can be set manually using the left/bottom button.

An MSFS command: **"Set Heading Indicator"** is available.

A "detector" compass installed at the tail end of the aircraft (to avoid magnetic interference) reads the aircraft's heading, which is transmitted to the Gyrosyn, thus ensuring a precise and stable heading indication.



The heading set on the Gyrosyn can be checked on the backup compass. (Note: the compass shows the opposite heading to the Gyrosyn.)

5) Pitch trim:

The pitch axis, around which the aircraft's attitude increases or decreases, is controlled by the vertical trim, which is indicated by the TRIM instrument.

Vertical trim is adjusted by the pilot on the joystick. In simulation, given the difficulty of reaching this button with the mouse during flight, this button has not been modeled.

To activate vertical trim, the MSFS commands are available: "ELEVATOR TRIM UP," "ELEVATOR TRIM DOWN."

The roll and yaw trim controls are located on the left panel.

See the elevator chapter.

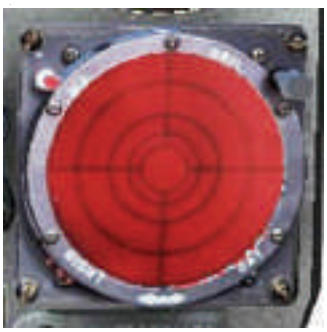
6) Jet temperature:

Corresponds to the various settings for the number of revolutions per minute (RPM) of the engine.

If the red line is exceeded, the engine will catch fire!

See the engine section.

7) Radar 77:



The Radar Warning System 77 (RWS 77 MELPAR) allows the pilot to observe the radar situation around his aircraft. He is informed of this situation by means of optical and acoustic signals.

It is controlled by the control device located on the right panel.

This system is not modeled.

8) Warnings and indicators:

See chapter on flight controls

See chapter on flight controls

See chapter on FLAPS (flaps)

See chapter on flight controls / elevator

See chapter on electrical power supply

See chapter on electrical power supply

Pitot tube activation indicator light, switch on the switch panel.

Artificial horizon backup power supply
See electrical installation

b. Left central panel

1) Landing flap control:

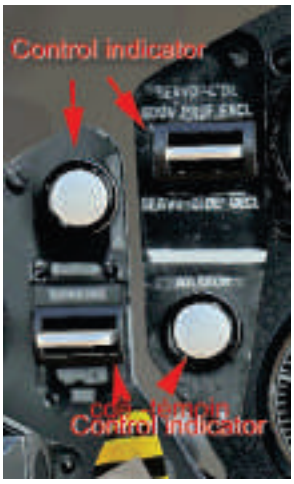
The flap control allows them to be extended to 15, 23, 30, 38, 45, 60, and 80°.

The "EMERGENCY FLAPS" lever allows the flaps to be extended in an emergency using compressed air contained in a cylinder. The pressure gauge on the left panel indicates this pressure. (only if the hydraulic pressure is at 0)

See chapter Landing Flaps Emergency Air Pressure

2) Flight controls, aileron, elevator:

The aileron and elevator controls are hydraulically assisted.



Elevator servo control on the center panel, indicator light on the left center panel
Aileron servo control on the left center panel, indicator light on the center panel

They are engaged after the engine is started (EFB Chapter "Before taxiing," aileron servo control: ON, elevator servo control: ON).

The indicator lights are white when the servos are not engaged and black when engaged.

If the hydraulic system fails, the servo controls can be activated using the two buttons (at the bottom of the center panel) N/O

See chapter on Ailerons

See chapter Elevator

3) Landing gear control:

To retract the landing gear: RENT control.
To extend the landing gear: SORT control.
MSFS CONTROLS: "TOGGLE LANDING GEAR"

On the RENT control: the EMERGENCY sub-control allows the landing gear to be retracted by turning it. N/A

The landing gear position indicator lights can be set to two intensities: DAY/NIGHT.

The "LANDING GEAR" indicator light

See landing gear

4) Air brake:

The AIR BRAKE indicator is white when the air brake is extended and black when it is retracted. (See the Air Brake section).

5) Hydraulic alarm indicator:

The indicator light comes on when the hydraulic pressure is insufficient.
See the chapter on the hydraulic system.

c. Center right panel:

1) Engine RPM gauge:

See the chapter on the engine.

Indicates the number of RPM x 1000, from 0 to 7,850 RPM, idle 2,450 RPM
Inscriptions:
PRO FLUG: max 15 min. 7,750 RPM, max 3 min. RED 7,850 RPM
MIN IM LANDEANFLUG: 4,400 RPM

Engine fire after 6 minutes at 7,850 RPM
on the ground or in flight

Fire extinguisher N/A

2) Cabin altitude:

See the chapter on Cabin Conditioning.

The ALT instrument indicates the altitude inside the cabin.

The CAB PRESS. indicator is illuminated (red) if the difference between cabin pressure and outside pressure is less than 3,000 m, as soon as the altitude exceeds 3,000 m/M.

3) Oxygen tank pressure:

The pressure is always at FULL when the aircraft is loaded.

See the chapter on the oxygen system.

4) Switches and warning lights:

The "CARB LOW PRESSURE" indicator light comes on if the feeder pumps are not engaged. N/A, see chapter on fuel

"STOP SIGN. ACOUST. PRESS. HYDR." Enables the acoustic signal to be triggered when the hydraulic pressure is low or not yet at the normal level when starting the engine. See EFB chapter Preflight/Hydraulic acoustic signal/OFF, or even chapter Hydraulic system

CAMERA: N/O, allows CLEAR/DARK adjustment of the camera.

The radio call repeats the aircraft identification according to the chosen livery.

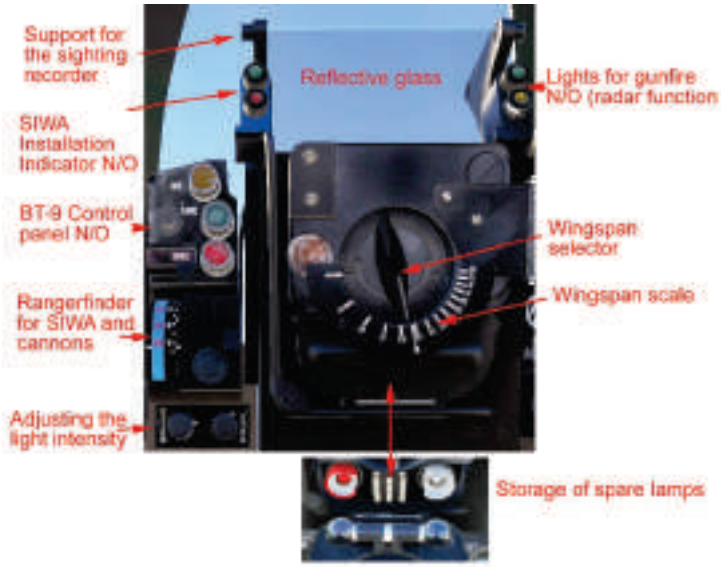
d. Upper Central Panel:

1) Weapons controls:

The armament control panel is not operational as no armament can be loaded at this time. The jettisoning of internal and external tanks will be modeled in a future update.

2) The sight:

Operation
Detailed, see chapter
Armament



Mission map placed in front of the sight (removable)

SIWA: air-to-air guided missile with seeker head

3) Maverick control:

Maverick: AGM-65 A remote-controlled missile equipped with a solid fuel engine and a TV guidance seeker.

Video display of the Maverick installation and various control switches for this weapon. See details in the Armament chapter.

4) G-meter:

Permissible limits: +7 g, -3.5 g
The right button at the bottom allows the pilot to reset the only the yellow indicator; the red indicators
can only be reset to 1g by the mechanic.

5) Fire extinguisher control :

The fire extinguisher controls with the fire warning light in the center , the cover raised, the button controlling the extinguisher can be activated. Fire extinguisher N/O

6) Stopwatch:

Is set to the system time.
The button allows the stopwatch to be started and stopped.
stopwatch.

7) Emergency compass:

e. Leftmost panel:

2 Fuel gauge lamps, or fuel system installation
with the upper button for checking the operation of the lamps

CHAFF and FLARE release control, see chapter
CHAFF and FLARES

f. Lower center panel:

1) Switch bar:

The switches are, in order:
ACCUS / CAMERA N/O / CHAUFF CLACE-FR N/O / AGM 65 BT9 N/O / VISEUR / PITOT / REACTEUR

Pushing the lever up activates all switches (except PITOT) and returns to its original position after activation.

See EFB checklist for switch activation sequence

2) Oil pressure:

10 = minimum at idle
25 = minimum at 7,500 RPM
25-40 = normal pressure during flight
50 = maximum permissible pressure

See engine

3) Spark plug ignition switch:

Locked in the ON position by the white bar, allows the mechanic to trigger the ignition system on the on the ground during aircraft preparation. N/A

See engine

4) Starter:

Starter with and without protection,
the start-up process is initiated
is initiated by pressing the button for 2 seconds.

g. Front left board:

Upper section

Lower section

1) Radio equipment:

The aircraft is equipped with VHF and UHF radio equipment N/O

As military transmitter frequencies are regularly changed for security reasons, the choice was made according to the tables below using three-digit numbers, for example for the Payerne GCA 118 or 119 in VHF and 218 or 219 in UHF.

Radio button N/A

Radio control panel, N/A

See radio section

2) Trim steering and ailerons:

See chapter: Hydraulic system and Servo controls .

The DIRECTION TRIM and AILERON TRIM switches
AILERON switches and the associated indicators are active

MSFS controls: ELEVATOR TRIM UP/DOWN
AILERONS TRIM RIGHT/LEFT

Emergency systems are N/A

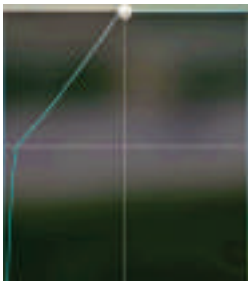
3) Brakes:

The pressure gauge indicates the overall pressure of the SUPPLY BRAKES system and the pressure per wheel: PORT = left, STARBD = right.

See chapter: Hydraulic system and Servo controls.

MSFS Controls: RUDDER AXIS, RIGHT/LEFT BRAKE AXIS
TOGGLE PARKING BRAKES

Recommended brake settings:

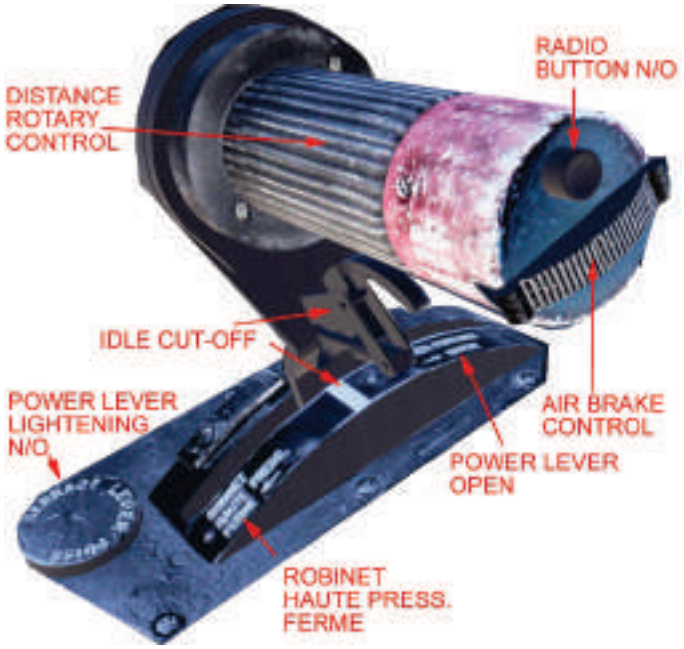


4) Relight switch (RELIGHT)

For restarting the engine in flight, see the Engine chapter

5) Power lever :

The power lever has two functions:



High pressure valve: when starting, the lever is in the HIGH PRESSURE VALVE CLOSED position. Moving the lever forward puts it in idle power position (white line).
To close the valve = shut down the engine, press the IDLE STOP button (with a click). The power lever then returns to the HIGH PRESSURE VALVE CLOSED position.
(This lever is difficult to reach; you have to look down to reach it).

Engine power control: from the white line to the forward position, the engine goes from idle to full power.

MSFS CONTROLS:

Power lever: THROTTLE 1 AXIS
Distance drum control: THROTTLE 2 AXIS
Air brake control: TOGGLE SPOILERS

See engine section

6) Low Pressure Lever:

Cuts fuel supply to the engine; must be in the OPEN position during start-up.

7) Cabin pressure and heating:

PRESS DYN. Activates the dynamic air intake valve (for the pitot tube)
PRESS CAB. Activates the cabin air conditioning. (see Cabin Altitude)
TEMP CAB. Activates the adjustable thermostat

This triple switch must be engaged at start-up.

The switch on the right activates HOT AIR N/A.
On the right, you can adjust the cabin temperature N/A

The cabin pressure control switch is N/A

8) Emergency landing gear release and Jet temp control:

The jet temperature is controlled by a system that can be disabled using this switch. N/A see engine section

EMERGENCY LANDING GEAR release lever (active if hydraulic pressure is at 0)

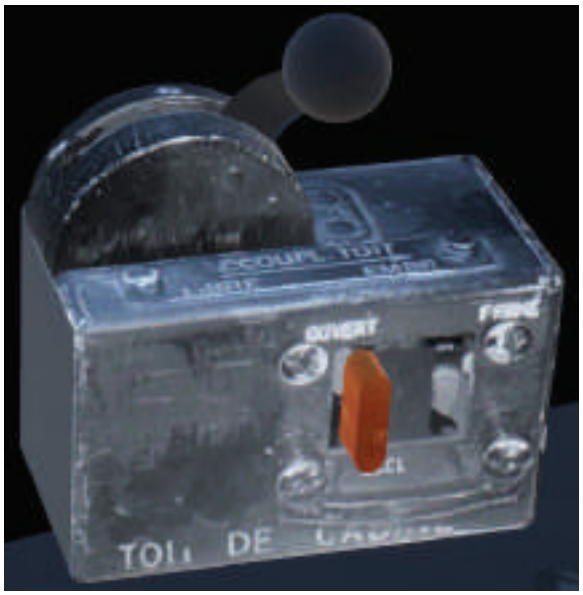
9) Brake parachute:

N/O, modeling planned

10) Ground air brake control:

Spring switch, on CONTR. Allows the ground air brake to be tested, limited to 15°. The air brake retracts immediately when the spring switch is released. Modeled.
See Air brakes

11) Cabin roof closure:



The ROOF COUPLING lever allows the roof to be opened or closed manually. N/A

The lower lever is used to mechanically control the opening or closing of the roof, modeled.

There is no MSFS CONTROLS command for opening or closing the roof.

12) Landing and taxi lights:

The light turns off and retracts when the landing gear is retracted. When the landing gear is extended, the light can be extended or retracted.
.
See electrical chapter

13) Cabin roof release:

N/A

h. Rear left board

The three pressure gauges indicate the pressure in the compressed air tanks for the LANDING GEAR, FLAPS, and BRAKES. Backup system in case of hydraulic system failure. N/A

Other components: ROOF AUTO CONTACT/STABILIZER fuse, CONVERTER SELECTOR and CABIN PRESSURE CONTROL are N/A
See Emergency Air

Converter selector, N/A. See Electrical System section

i. Front right bench board:

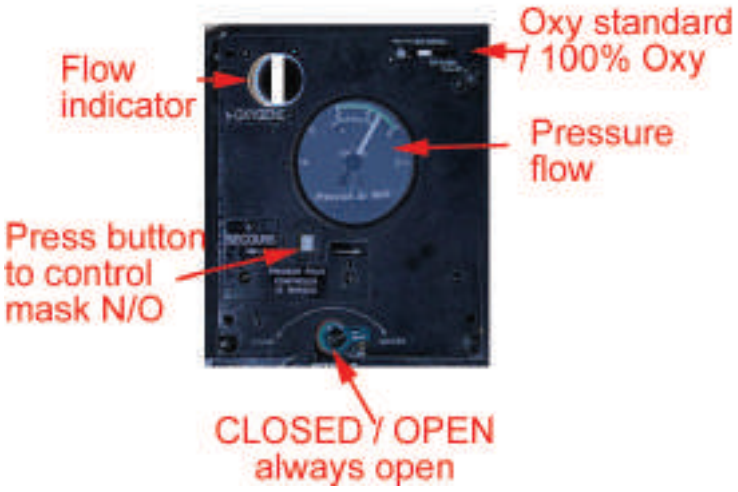
On the wall

1) Oxygen:

The oxygen supply is always open!

EMERGENCY OXYGEN
Emergency circuit for supplying oxygen to the during ejection or in the of a failure of the onboard system N/A

pilot event

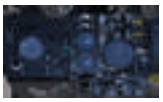


The oxygen tank pressure gauge is located on the center right panel. The oxygen tank contains enough oxygen for approximately 2 hours of flight, with 100% for 1 hour.

2) Fuel panel :

Includes two fuel gauges, switches for the feed pumps with indicator lights, indications of fuel flow between the various tanks, and indicator lights for empty or full external tanks.

See the chapter on fuel for details on operation.



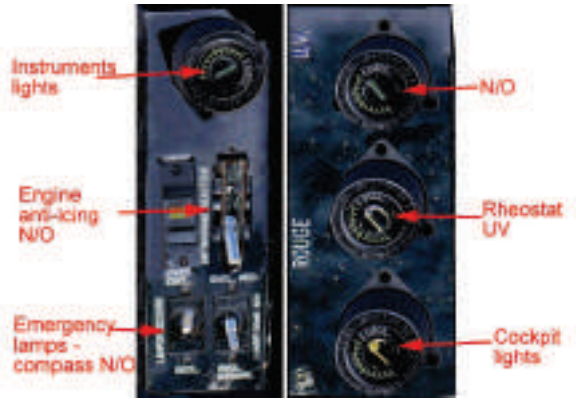
3) RWS 77 MELPAR radar controls:

The RWS 77 MELPAR radar system is not modeled, N/A
See indicator on lower center panel
See RWS77

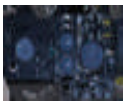
4) CHAFF and FLARES controls:

Not modeled at this time, N/A, see CHAFF and FLARES section

5) Cabin lighting:



Lamps



See electrical installation

j. Center right board:

1) IFF

Secondary identification radar IFF = Identification Friend or Foe. Allows military radar to recognize friendly aircraft and determine their heading and distance. N/A

Electronics section

2) Rocket salvo control:

Salvos of 25, 50, or 100%, indication of remainder in %, N/A

See weapons chapter

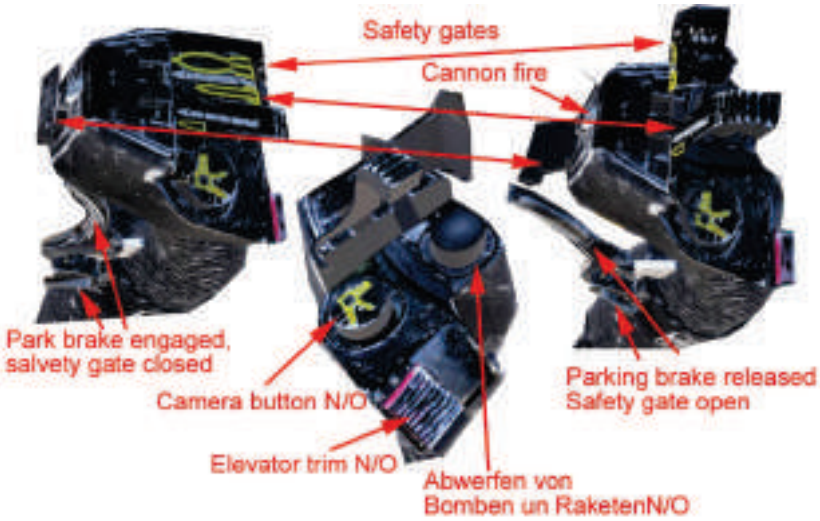
3) G installation test:

To activate and test the pilot's anti-g system, N/A

k) Rear right board:

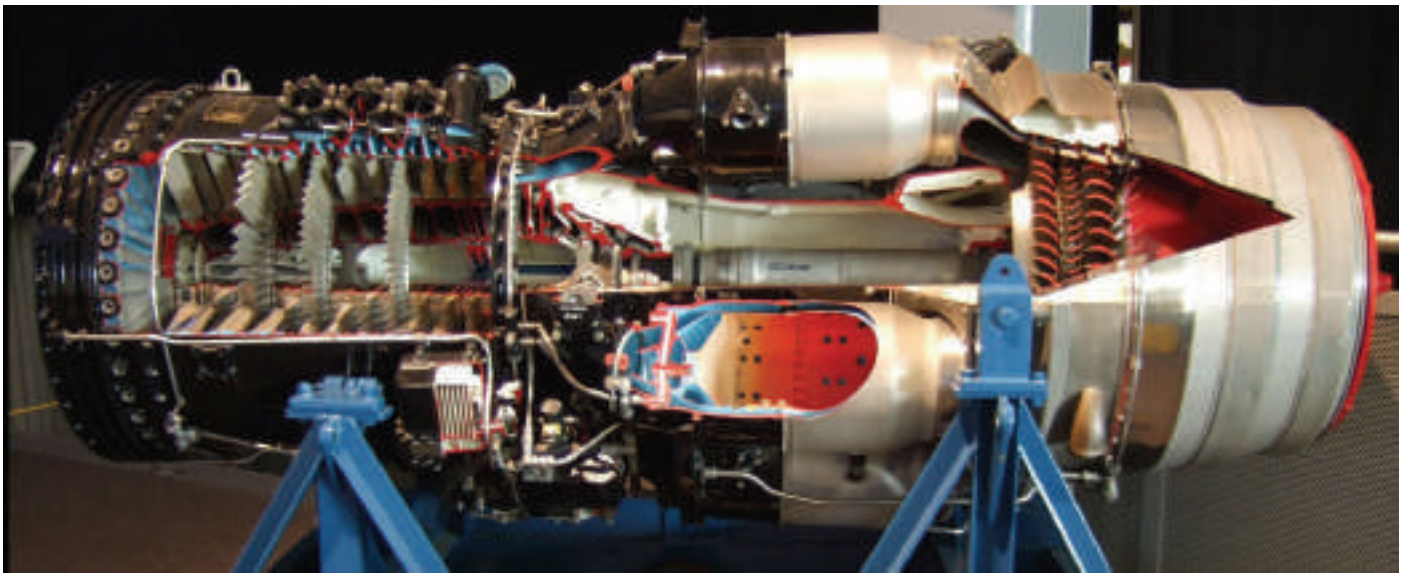
Various controls for the fuel system, fuel pumps, and fire control. N/A

l) The control stick and its controls:



8. Systems and components:

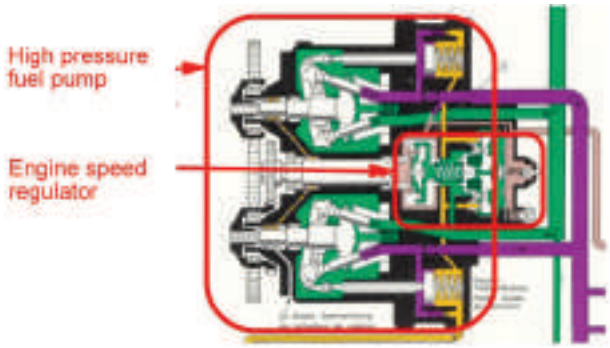
a) The engine:



The AVON 203/207 jet engine

15-stage axial compressor, driven by a 2-stage turbine. Thrust 4,580 kp at sea level.

Important component of the engine: the fuel pump with its speed regulator limiting the maximum permissible value of the pump until the authorized speed is reached. Therefore, there is no limitation on the movement of the power lever.



Engine controls: low-pressure valve and high-pressure valve. Power supply. Starter.

Control instruments: jet temperature, RPM, hydraulic pressure, restart switch,

Other non-modeled components N/A: Engine anti-icing system, circuit breakers, Spark plug ignition switch, jet temperature control

Engine limits:

The engine catches fire after 6 minutes at 7,850 RPM.

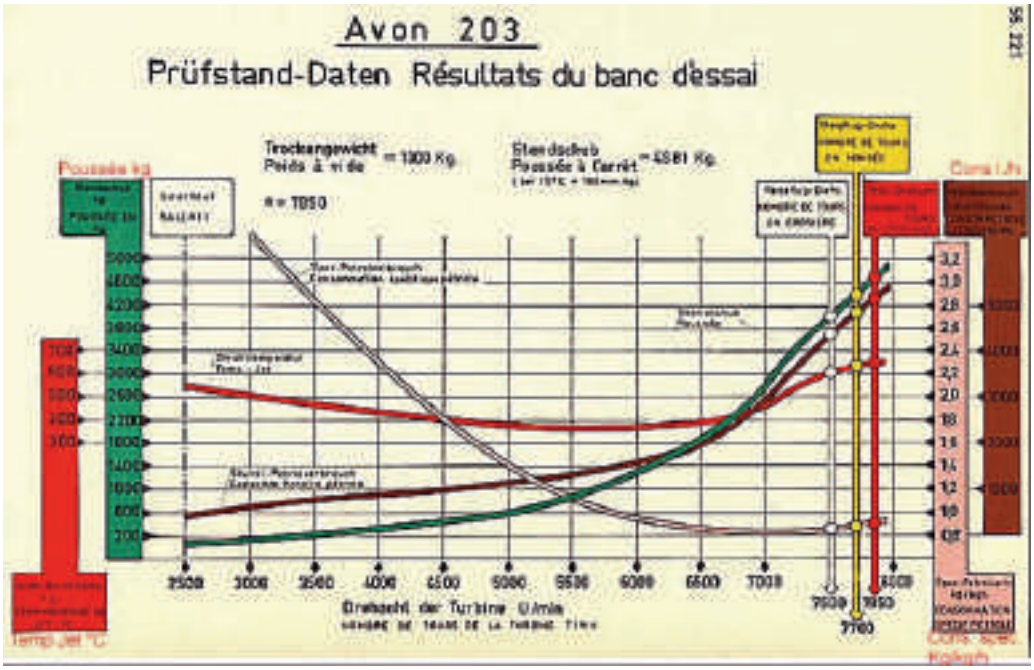
See restart procedure
In the document Checklist

LIMITES DU RÉACTEUR

Régime de puissance		Limites		
		Régime	Temp jet °C	Durée
rouge	décollage et régime de combat	7'850	690	3 min
jaune	régime de montée	7'700	665	15 min
blanc	régime de croisière	7'500	630	
--	régime d'approche	4'500	460	
--	ralenti au sol	2'600 +250 - 50	560	
--	mise en marche	--	635	3 s

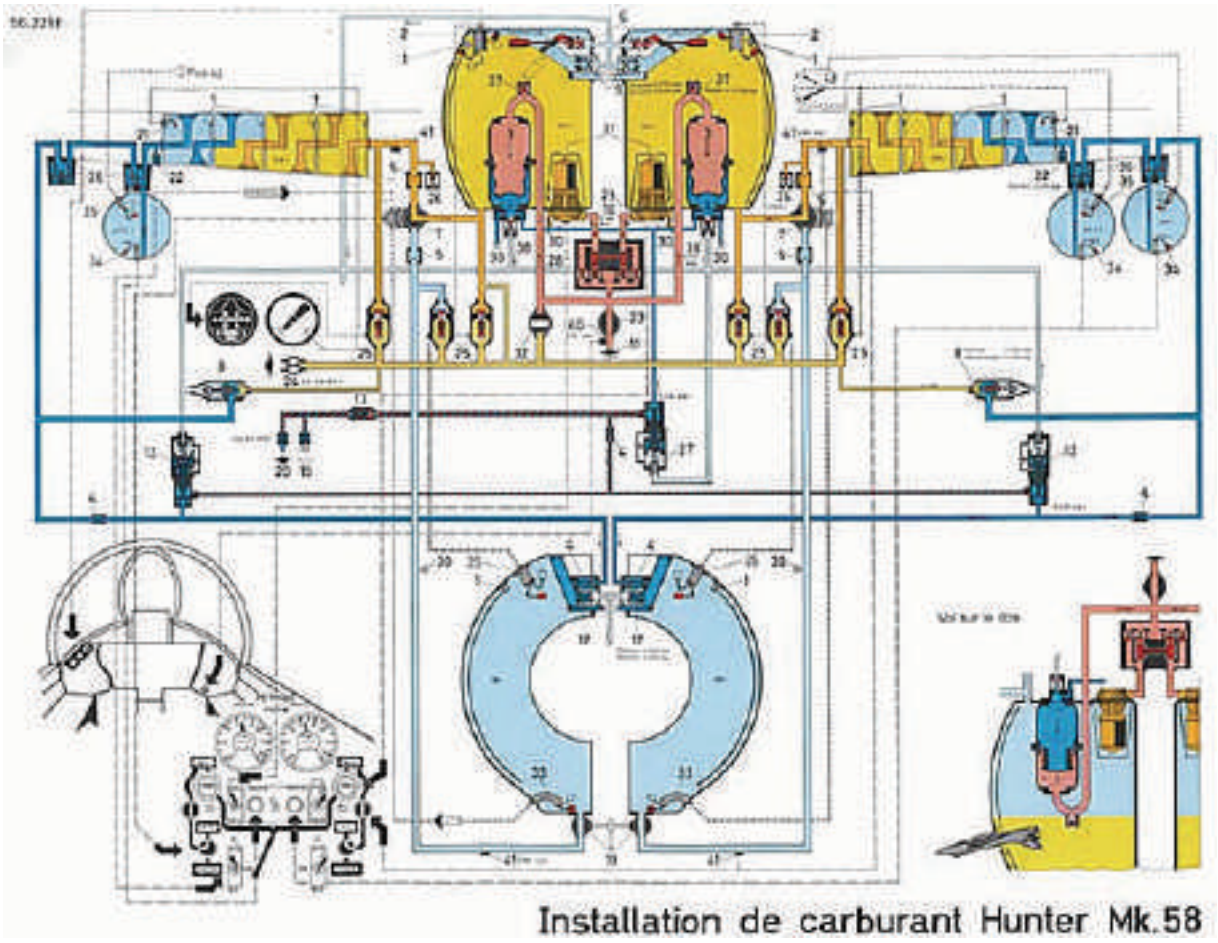
approximately

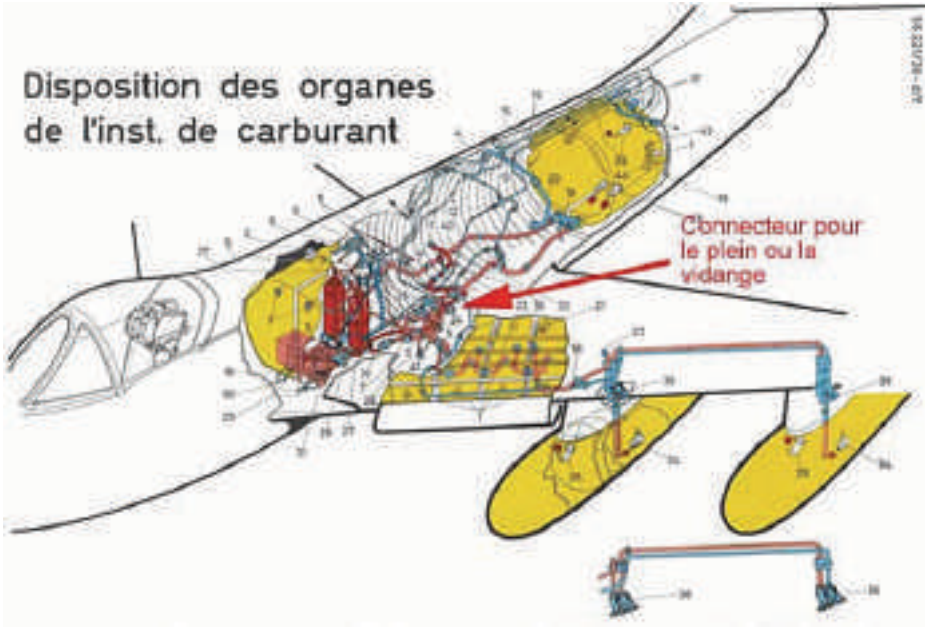
Bench test:



TM

b) Fuel system:





Important:
The rear tanks empty first.

The outer tanks then empty into the wing tanks.

The wing tanks empty, and the fuel flows into the front tank.

The contents of the tanks can be modified at any time by the EFB "Fuel."

Contenance des réservoirs

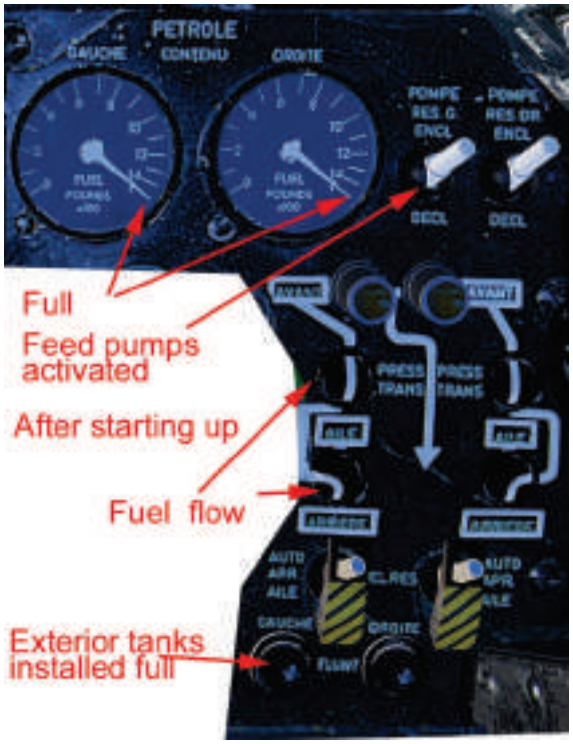
Réservoirs fixes:	Litres	kg	lbs
- réservoirs fuselage AV	908	717	1'582
- réservoirs fuselage AR	236	187	410
- réservoirs alaires	636	502	1'108
Total:	1'780	1'405	3'100
2 FLUNT internes 150 gal	1'350	1'067	2'351
Total:	3'130	2'472	5'451
2 FLUNT externes 100 gal	910	719	1'587
Total:	4'040	3'188	7'038

Indication of tank contents and flow:

Before starting the engine

Right front seat

After starting the engine. Tanks full



In flight, the center tank empties first:

The rear tanks are empty, the outer tanks have emptied into the wing tanks:

The wing tanks are empty, leaving the forward fuselage tank:

Tanks almost empty, low fuel warning light on:

[The low fuel warning light](#) comes on
When the fuel level in the
Front tanks has dropped to 650 lbs (+ 100/-50 lbs)

The amount of fuel can be changed at any time by changing the Quick fill %.

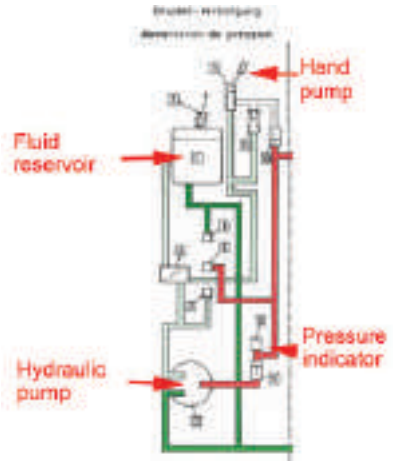
On the right front panel, a low fuel pressure warning light
(< 500-600 psi) warning light (before engine start-up or when the engine is shut down in flight). On the right panel. A failure is not modeled
Low fuel is installed N/A

[TM](#)

c) Hydraulic system and servo controls

1) Pressure supply:

The pressure warning device allows to mute the sound that occurs when the hydraulic pressure is too low (< 500-600 psi) (before starting the engine or when the engine is shut down in flight.



On right panel

A failure is not modeled.

Low hydraulic pressure warning light, left center panel

TM

2) Maxaret brakes:

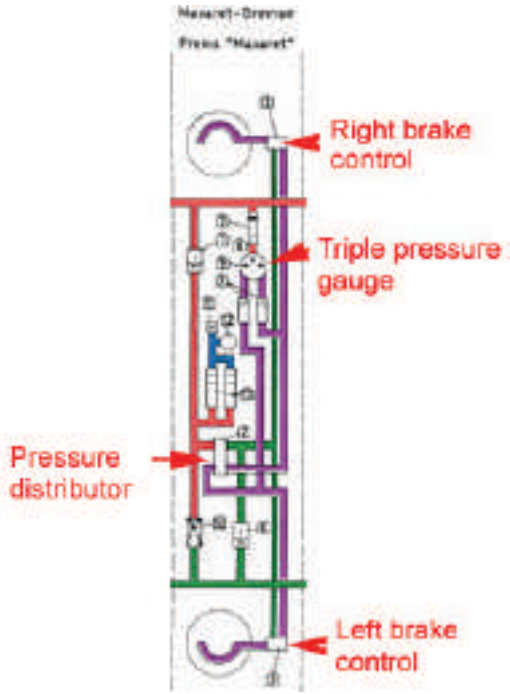
Maxaret brakes are equipped with a system that prevents the wheels from locking during braking.

The triple pressure gauge system pressure (SUPPLY) Max. 2,850 psi

Hydraulic pressure depends on the rotation of the reactor

Below that is the pressure of the Maxaret brakes

CONTROLS:
LEFT/RIGHT BRAKE AXIS



On left board

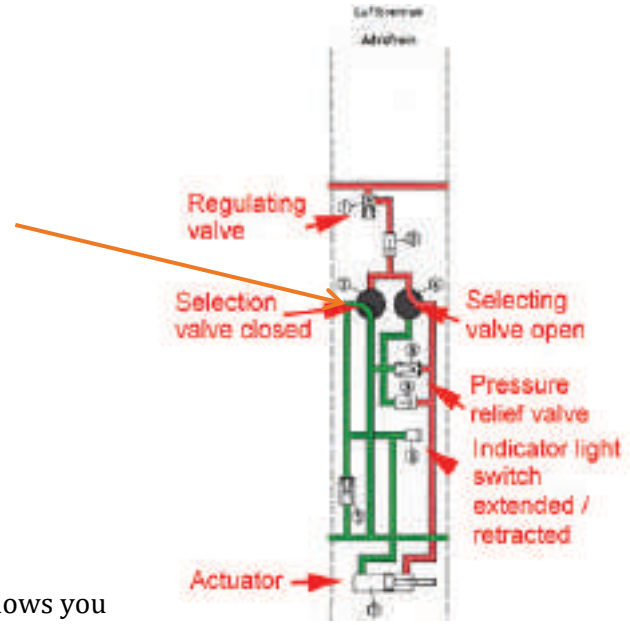
front

TM

3) Air brakes:

The air brake retracts automatically when the landing gear is retracted.

Air brake control
On the throttle lever
Toggle Spoilers



Air brakes Ground control:

Spring switch, on CONTR. Allows you to test the air brake deployment on the ground, limited to 15°. The air brake retracts immediately when the spring switch is released. Modeled

TM

On the panel

Left center

White = deployed

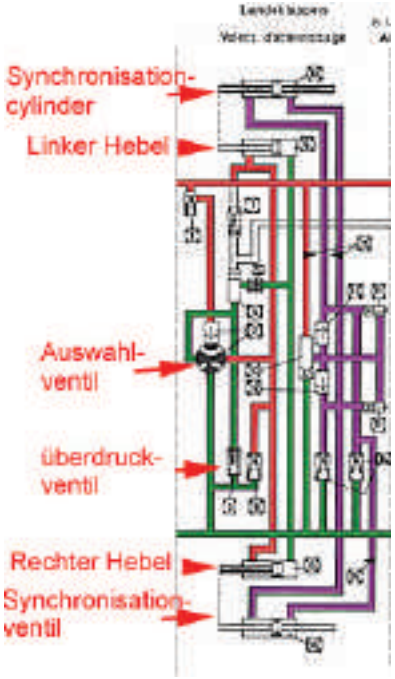
Black = retracted

4) Landing flaps:

Can be extended from 0 to 80°
(15, 23, 30, 38, 45, 60, 80°)

They can be extended at all speeds, but a pressure relief valve retracts them gradually at speeds above 500 km/h, fully retracting them at 800 km/h. They extend again if the speed decreases.
Controls: INCREASE/DECREASE FLAPS

TM



Extension limiter at 45° if 450 kg bombs are loaded.

5) Backup air pressure

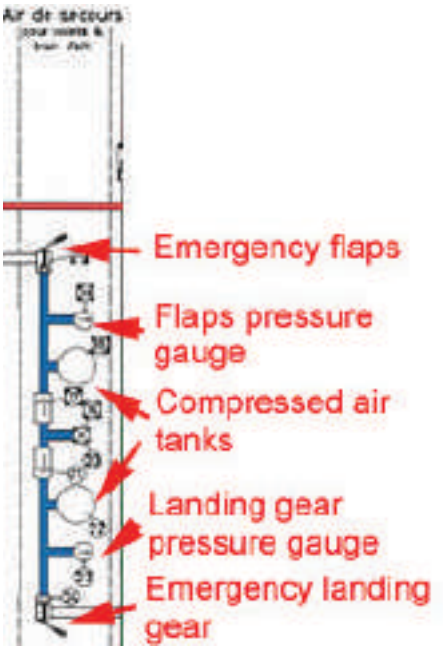
In case of hydraulic failure

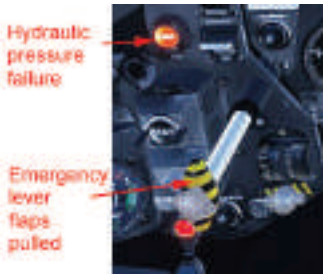
Modelled with engine shut down

A system of compressed air tanks ensures the deployment of the flaps and/or landing gear.

Cannot be retracted

Pressure gauges



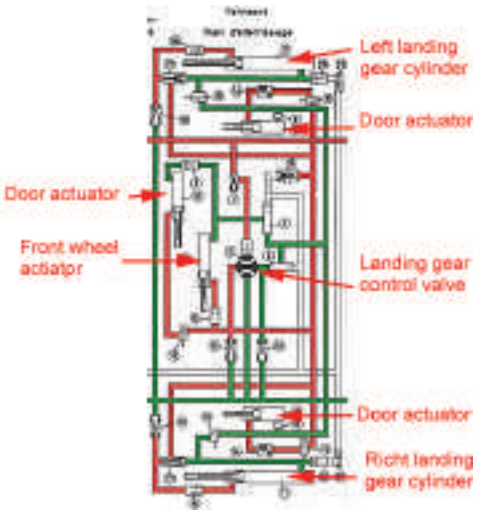


TM

6) Landing gear:

Landing gear retracted

Landing gear in in motion



Cde CONTROLS: Toggle Landing gear

When the landing gear on the ground is loaded with the weight of the aircraft, the landing gear retraction control button is mechanically locked

Landing gear extended, secured

Night lighting, landing gear extended

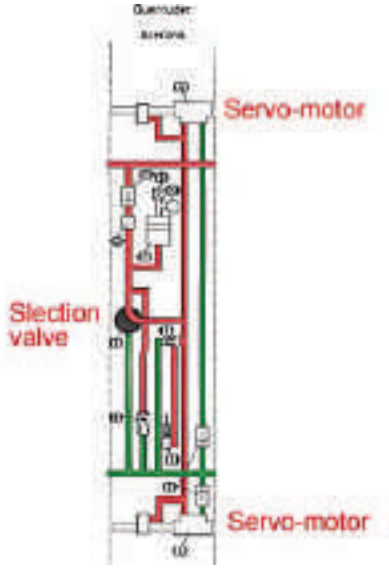
TM

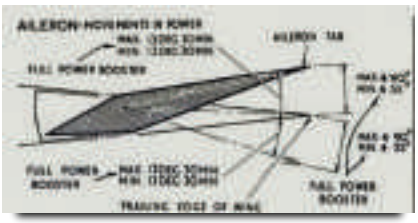
7) Aileron control:

The aileron controls are servo-hydraulically assisted. As force feedback cannot be modeled, there is no effect on the control force!

Hydraulic assistance is activated when the engine is started (EFB/Before taxiing) by the SERVO-CDE AILERONS ENCL. control.

The AILERONS indicator is black if the assistance is engaged, white if it is not engaged or in the event of a hydraulic failure (Failure N/O).





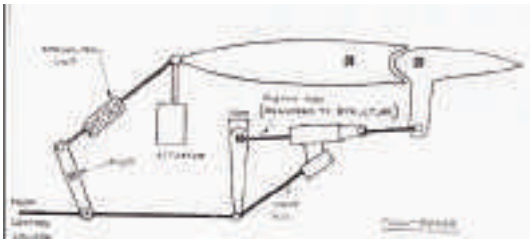
CONTROLS: AILERONS AXIS

In the event of a hydraulic system failure, the servo controls can be activated using the two buttons (at the bottom of the center panel) N/A

TM

8) Horizontal tailplane and elevator

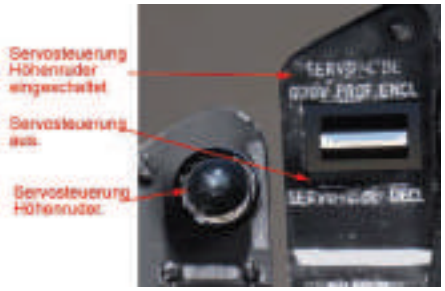
To increase maneuverability in transonic flight, the angle of incidence of the fixed wing is automatically adjusted to the various deflections of the elevator.



down	neutral	up
		

The elevator control system is divided into two parts, one electrical (horizontal plane) and the other hydraulic (movable plane).

The elevator servo control (movable plane) is engaged when the engine is started (EFB-Before taxiing) by the SERVO-CDE ELEVATOR control.



The GOUV. PROF. indicator is black if the hydraulic assistance is engaged, white if it is not engaged or in the event of a hydraulic failure (Failure N/A).

In the event of a hydraulic system failure, the servo controls can be activated using the two buttons (at the bottom of the center panel) N/A

The angle of incidence of the horizontal elevator plane is also adjusted by the elevator trim function (an electric control).

The elevator trim control is located on the power lever. N/A

Cde CONTROLS: ELEVATOR TRIM UP (NOSE UP)/ELEVATOR TRIM DOWN (NOSE DOWN)

The trim position is indicated on the TRIM indicator.

If the motor controlling the horizontal elevator is blocked or no longer receiving power, the horizontal elevator can be operated by a backup motor. N/A (except cover)

Emergency motor control closed

(open)

TM

d) Electrical installation

1) Batteries

The batteries are activated by the ACCUS switch on the switch bar:

(EFB, Pre-Flight, ACCUS ON)

The two GENERATORS lights come on when the engine speed is < 1,800 rpm, or if the generators are out of order N/A, with covers to reduce the light intensity during night flights. The third light concerns the SIWA/BT9 converter; see the armament section.

2) The generators

Two generators, connected in parallel and powered by the engine, produce the electricity needed to power the electrical systems and charge two 24-volt batteries, also connected in parallel. These two generators produce direct current and have a power output of 6,000 watts. Depending on the battery charge and the energy used, the generators start to produce power as soon as the reactor reaches nT = 1,800 rpm.

The generators are activated by the REACTOR switch on the switch bar:

(EFB, Engine start, Switch bar ON)

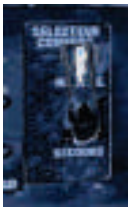
Generator failure: two red lights come on: N/A

3) Converters

Two converters provide alternating current (115V, 400 Hz) for
- navigation instruments
- cabin pressurization and temperature control
- oil pressure measurement N/A

Converters that have tripped or are faulty are indicated by the warning light:

A selector switch allows manual switching from normal converter no. 1 to 2 backup converters, N/A



In the event of a power failure, two backup batteries ensure the operation of the servo controls (elevator and ailerons) and the brake parachute control N/A without any additional manipulation, as well as the cab backup lighting via the BACKUP LIGHTS switch, the emergency compass lighting via the EMERGENCY COMPASS LIGHT switch N/O, the power supply to the artificial horizons via the EMERGENCY HORIZON POWER SUPPLY switch N/A.

4) Cabin lighting:

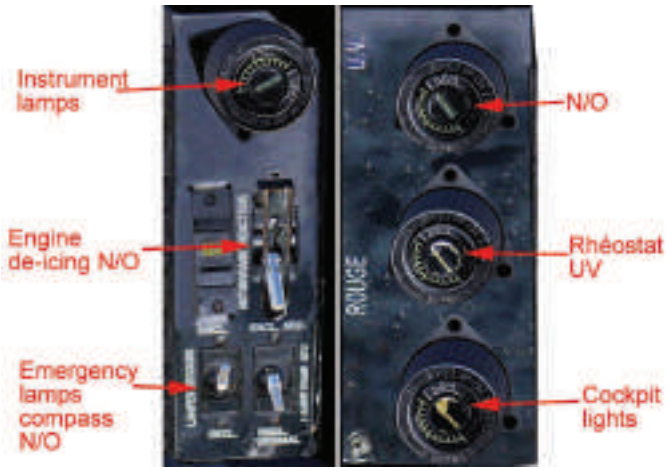
With the EMERGENCY LIGHTS switch set to ON (representing the portable lamp that follows the pilot's gaze), the cockpit is illuminated at night even without turning on the BATTERY switch. For other lighting, the BATTERY switch must be turned on.

EMERGENCY LIGHTS

Instrument light

UV light

Cockpit light



5) Exterior lighting

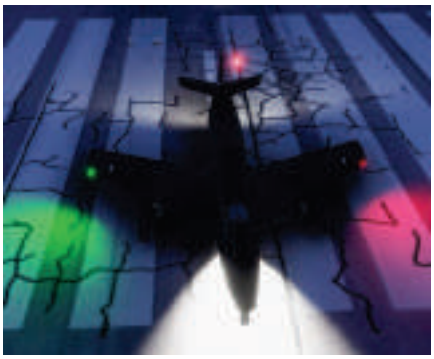
for taxiing and landing:

3 positions:

TAXI/DECL./LANDING, switches off automatically when the landing gear is retracted.

6) Navigation lights

Always activated by the ACCU switch



TM

e) Electronic installation:

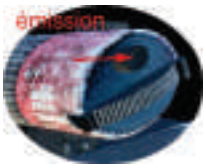
1) VHF and UHF radios:

VHF = SE-011, UHF = SE 056 N/A

Will be operational in a future version of the Hunter for navigation and air traffic.

Control box N/A

Radio transmit button on the power handle N/A



As military transmitter frequencies are regularly changed for security reasons, the choice was made according to the tables below using three-digit numbers, for example for the Payerne GCA 118 or 119 in VHF and 218 or 219 in UHF.

For ATC traffic:
The "Communication" menu is active.

2) The IFF installation:

Secondary identification radar IFF = Identification Friend or Foe. Allows military radar to recognize friendly aircraft and determine their heading and distance.
N/A

3) Radar warning system 77 (RWS77) MELPAR:

The RWS 77 system allows the pilot to observe the radar situation around his aircraft. He is informed of this situation by means of optical and acoustic signals.
N/A

77 warning radar control, N/A

4) Antennas:

TM

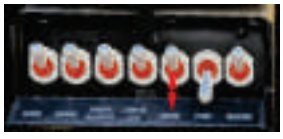
f) Armament:

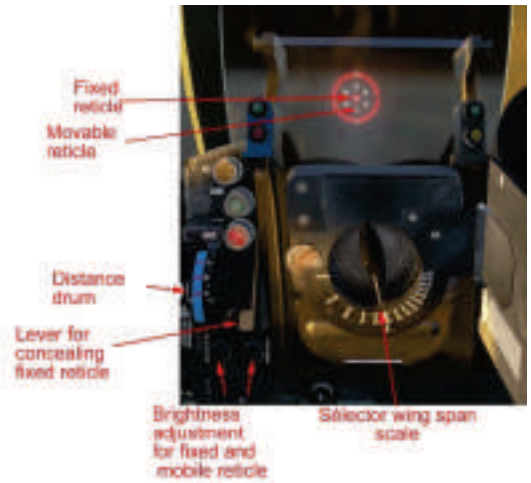
Microsoft Flight Simulator 20 and 24 do not allow weapons to be engaged. Solutions have been found to simply load or unload weapons, but also to fire them effectively. We intend to gradually develop this capability. Follow our efforts in this regard on our website https://swissmilsim.ch
Only the sight is modeled.
Limited information is provided below on the weapon systems used by the Hunter MK58 and the cockpit controls.

1) The Sight:

The gyroscopic sight is used to hit targets with the aircraft's fixed cannons, guided missiles, rockets, and bombs.
The crosshairs of the sight are mobile and depend on a gyro rotating at a constant speed and driven by an electric motor. To determine the aiming point (target correction), the gyroscopic system takes into account the angular velocity of the target and the ballistic properties of the projectiles.

The sight is activated by the SIGHT switch.
Activated when the engine is started.





The 12-position sight selector allows the sight to be adjusted according to the weapons loaded. N/A

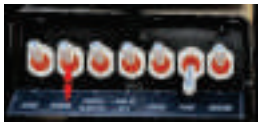
The movable reticle is linked to the distance drum, which is controlled by the movable part of the power lever:

CONTROLS: THROTTLE 2 AXIS

2) Vinten G-90 cine camera N/A:

This camera, located in the nose of the fuselage, is used in particular to verify the results of firing runs and unarmed attacks, as well as to capture images of aerial combat phases. N/A

Activated by the CAMERA switch on the switch bar



A light/dark diaphragm selector allows the camera sensitivity to be adjusted. N/A

3) The guns:

The aircraft is armed with four 30 mm ADEN Mk.4 H.V. cannons.

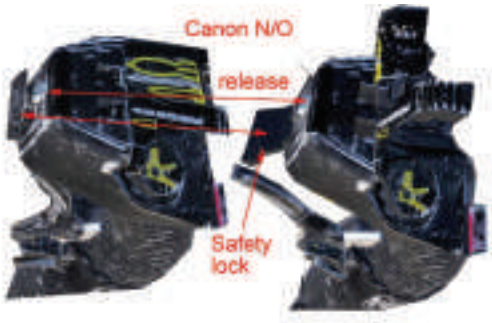
The cannons are mounted in a cradle housed in the front of the fuselage. The ammunition compartments in the hold and the feed channels are part of the installation. Interchangeable from one aircraft to another, the cannon cradle can be removed or installed (loaded) in one piece. (Images from Wikipedia)

The gun barrels are surrounded by flame arrestor tubes to prevent damage to the aircraft from muzzle flash and gas pressure at the muzzle.

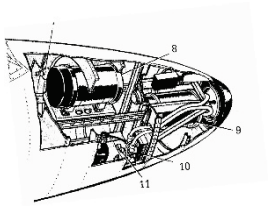
Two tapered collectors, mounted under the fuselage, collect the links in the front section. The rear section contains the CHAF and FLARES launch device. For training shots, the rear section is replaced by a shell collector.

The model includes loaded cannons, weighing 375 kg + 270 kg shells.

The cannons are fired using the N/O trigger on the control stick:



The cannons are currently fired N/O.



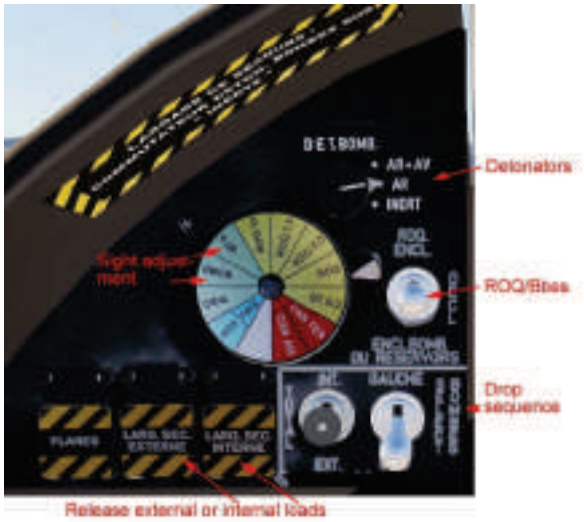
The fire control radar in the nose of the Hunter:
The radar has been disabled with the KAWEST upgrade, but remains in the aircraft for balance reasons (center of gravity)

4) Bombs, BT-9, and combiner NO:

Bombs can be mounted on external or internal pylons:

On external pylons:
450 kg high-explosive or armor-piercing bombs, 400 kg high-explosive bombs, 300 kg low-altitude release bombs (TABO), 210 kg AS MAVERICK guided bombs, practice bomb launcher.

On internal pylons: 450 kg high-explosive or armor-piercing bombs, 400 kg high-explosive bombs



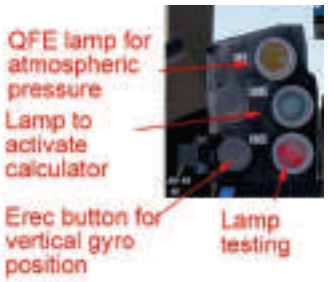
Bomb control panel: detonator, ROQ/Bbes selection, Int/ext release sequence, left, G+D and release of external loads, bombs or external/internal tanks. N/O

Bomb release is controlled by the joystick, release button, and safety valves: N/A

Bombs can be released with or without the **BT-9** bomb computer **for semi-automatic bomb release:**

The BT-9 is a semi-automatic electromechanical bomb release computer. In addition to the sight and release button on the stick, already mentioned, the pilot must operate the main switch, the BT-9 control device , and the combiner (aircraft weight, atmospheric pressure, wind, and target altitude).

The semi-automatic electromechanical calculator is adjusted using the COMBINATOR, which allows four pieces of data to be entered: the weight of the aircraft, barometric pressure, wind speed, and target altitude. N/A



The calculator is controlled by the ad hoc panel located on the left side of the board. N/A

The bombs are then automatically dropped on a clearance trajectory of +2 to +6 g. (loft drop)

5) Rockets:

The Hunter MK58's full complement includes 28 8 cm rockets. On the external pylon are three quadruple launchers. In addition, closer to the wing root are quadruple launchers, each carrying four 8 cm rockets. N/A

Salvo rocket firing is controlled with a remaining rounds indicator: N/A

Firing is controlled by the joystick: N/A

8 cm rocket.

6) SIWA guided missiles:

The SIWA (Sidewinder AIM9) is an air-to-air guided missile with an infrared seeker head. Autoguidance is activated by infrared radiation generated by exhaust gases, frictional heat, etc. emitted by the enemy aircraft. This is a passive guidance system, as neither the carrier aircraft nor the guided missile emits any pulses. The SIWA is guided by the target itself. As the pilot cannot influence the trajectory once the missile has been launched, he can disengage immediately after firing. The aircraft can be equipped with two SIWAs. They are mounted on the external pylons. N/A

Diameter 12.7 cm, length 300 cm, weight 81 kg.

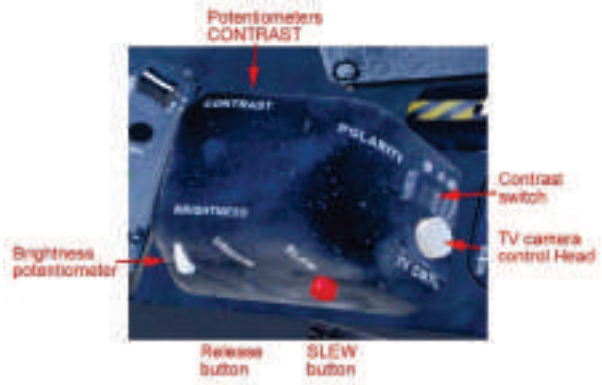
SIWA firing is only possible in the SIWA position of the sight: N/A

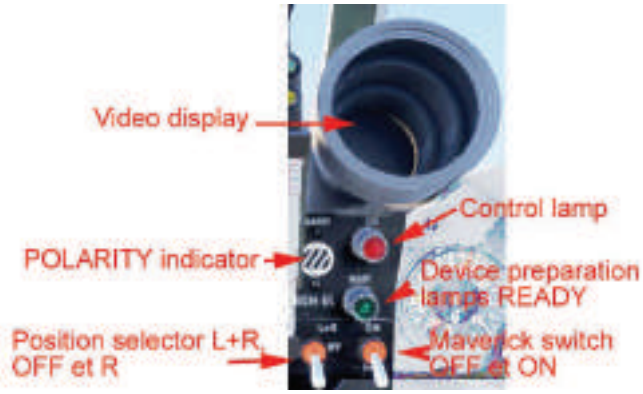
The red minimum firing range indicator lights up as soon as the distance between the aircraft and the target is less than 900 m. N/A

7) MAVERICK:

The AGM-65 A/Best guided missile is equipped with a solid fuel motor and a **TV homing seeker**. It is designed to combat tanks, armored vehicles, bunkers, etc. The pilot identifies the target on the video display, aims at it with the crosshairs, locks on with the search button, and fires the missile. As the missile flies autonomously toward the target, the pilot can either disengage after firing or attack another target during the same attack. N/A

The pilot uses the control station to adjust the brightness and contrast of the Maverick's TV camera.





8) CHAFF and FLARES:

FLARES modeling is included in our Hunter development program, follow us on https:// swissmilsim.ch

CHAFF: is a radar countermeasure in which an aircraft disperses a cloud of small pieces of aluminum, metallized fiberglass, or plastic, which appear either as a group of primary targets on radar screens or as multiple echoes that saturate the screen, in order to cause confusion and divert attention. The chaff used by modern aircraft consists of aluminum-coated fiberglass. N/A

FLARES A flare or heat decoy is an airborne infrared countermeasure used by an aircraft or helicopter to counter an infrared-guided ("heat-seeking") surface-to-air or air-to-air missile. Flares are usually composed of a pyrotechnic compound based on magnesium or another hot-burning metal, whose combustion temperature is equal to or higher than that of the engine exhaust gases. The objective is to cause the infrared-guided missile to seek the thermal signature of the flare rather than that of the aircraft's engines. N/A

The flare magazine is located at the rear of the cartridge case collector.

CHAFF and FLARE control panel N/A

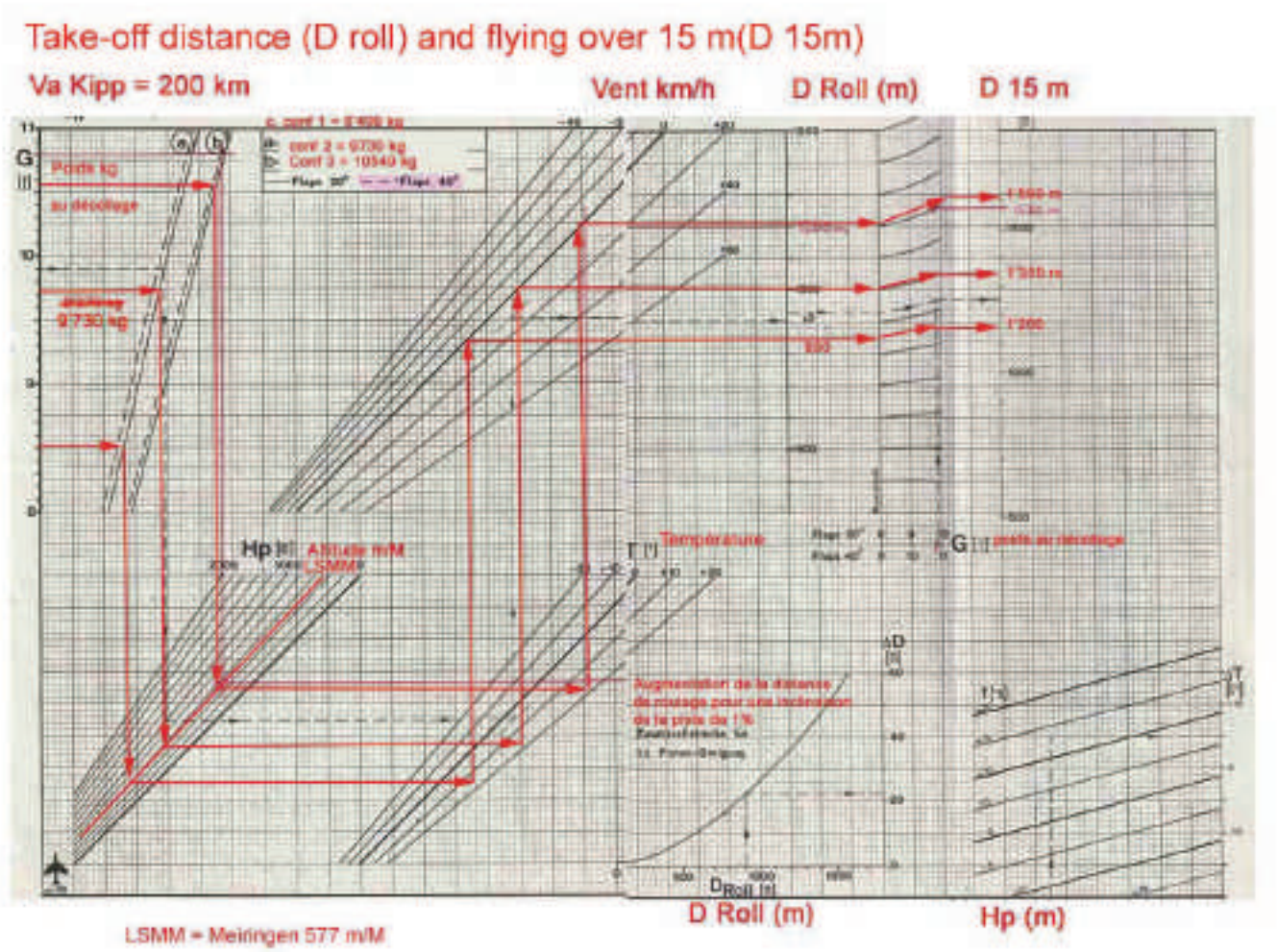
The flares could be dropped individually or according to a program. N/A

Controls on the instrument panel N/A

TM

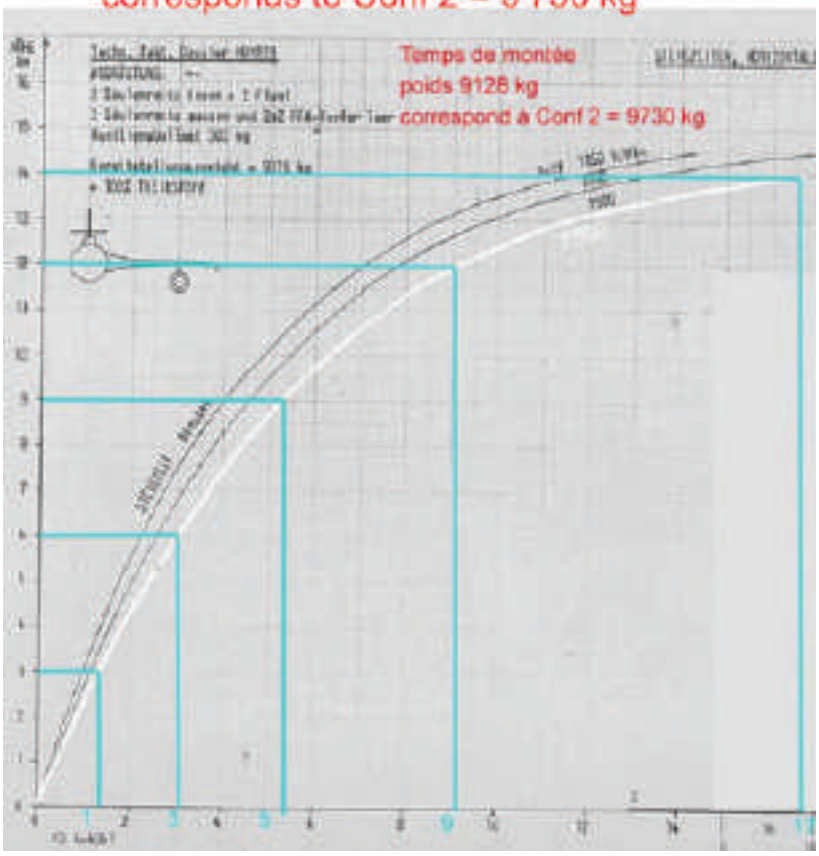
9. Performance:

1) Take-off distances:

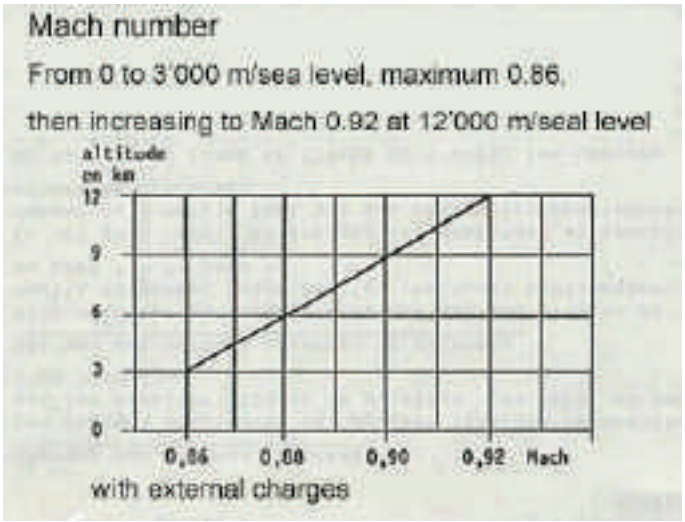


2) Climb speed:

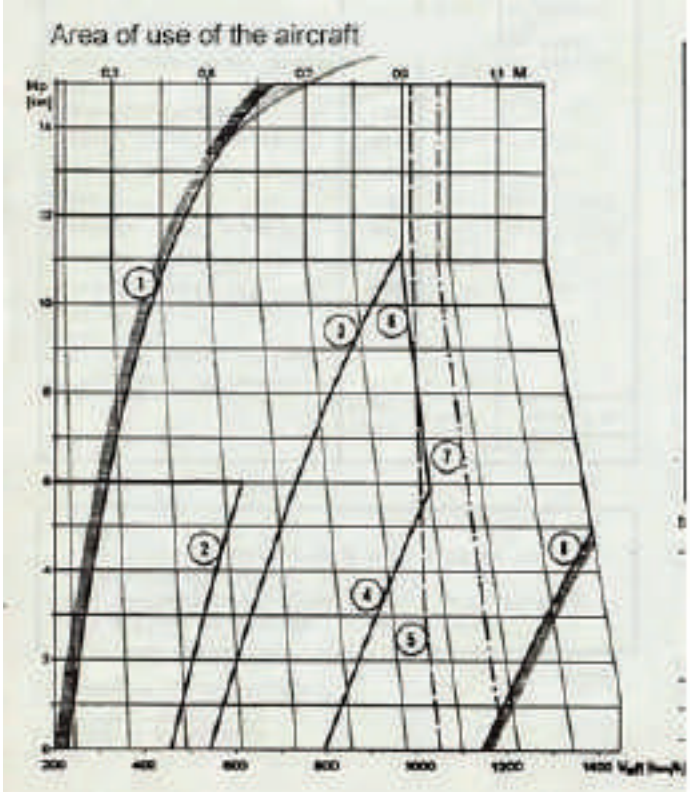
Climb time for weight 9'128 kg,
corresponds to Conf 2 = 9'730 kg



3) Maximum speed:



4) Minimum speed:



1	Vmini = Ve Buffeting
2	Vmaxi = Va 660 km/h, Flaps fully out
3	Vmaxi = Va 550 km/h, Flaps 38° (4e cran)
4	Vmaxi = Va 800 km/h, Flaps 15° (1er cran)
5	Vmaxi = Limit for heavy loads outside external pylons
6	Mach = 0,90, (M maxi) Limit for flaps extension
7	Mach = 0,97 Limit in peacetime
8	Vmaxi = Va 1150 km/h (with or without load)

Base:

- Configuration: 2 empty 150-Gal tanks, without ballast,external pylons without load, with double lance Roq and servo DC engaged
- Load factor: N = 1 g
- Load: 8400 kg
- Temperatures: without influence

Buffeting is not modeled.

5) Transonic flight:

Supersonic speed is possible in a 40° dive at full power. Start of flight at 12,000 m/M, maximum RPM 7,850, Mach 0.92. Dive at 40°, Mach 1.04 should be reached at 6,000 m/M. Level off at this altitude to return to Mach 0.98, which is the maximum speed at this altitude.

TM

10. THE ELECTRONIC FLIGHT BAG EFB:

The standard EFB for MSFS 24

Useful for startup via the "Checklist" chapter

Fuel control via the Flight performance/Mass and balance/Fuel chapter

For navigation via the Flight Planner

11. Copyright and restrictions on use:

Version 01.1, 13/12/25