

# *Fw 190 A*

*Baureihen 5, 6, 7, 8 und 9*

## *Handbuch* *Pilots Manual*

*Nur für den  
Dienstgebrauch!*

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# *Focke Wulf Fw 190 A*

*- The late Variants -*

*Aircraft Expansion for Microsoft Flight Simulator X*

*User Manual*



*November 2009, Version 1.0*

*A production of*



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***System Requirements:***

***Windows XP SP 2, Windows Vista or Windows 7,***

***Microsoft Flight Simulator X @ Service Pack 2, Gold or Acceleration Expansion Pack,***

***Dual Core Processor @ 2.4 GHz or better***

***512 MB DX9 Graphics Card***

***300 MB free disc space for the executable, 900 MB free disc space for the installation.***

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## *Introduction*

*With this second instalment in the Classics Hangar Fw 190 series the virtual pilot can now make the transition to blind flying and early radio navigation. Experience the sleek manoeuvrability of the Fw 190 A-5, make your way over the improved A-6 and A-7 sub variants to the versatile A-8. Deal with the weight of the heavily armed and armoured Sturmjäger and master the 2200 horse powers of the A-9, the final version of what many believe was one of the finest piston aircraft that ever flew the skies.*

*Included in this Flight Simulator X add-on package are renditions of the later production variants of the WW II Luftwaffe's second major fighter aircraft, the Focke Wulf Fw 190 A. Depicted are the standard variants Fw 190 A-5 to A-9, some of these in different configurations, as well as renditions of the Fw 190 A-7/R2 and the heavily armoured Fw 190 A-8 "Sturmjäger" sub-variants, the latter commonly known as "Rammjäger".*

*Each variant has a unique 3d virtual cockpit with fully operable and working 3d instrumentation, re-creating German period micro mechanics in a depth never before seen in a Flight Simulation.*

*The flight physics for each aircraft are captured uniquely, making full use of Flight Simulator's advanced 6DoF aerodynamic equations, including accurately modelled coupled Moments of Inertia calculations, giving the virtual pilot a distinct sensation of flying in air.*

## *Features*

- *10 highly detailed FSX-native exterior and interior models,*
- *16 historical exterior liveries in 2048 pixel high resolution textures supporting bloom, specular, bump mapping and self shadowing.*
- *Option to use extremely detailed 4096 pixel interior textures, configurable using an external texture manager application.*
- *Unique flight physics for each sub variant, highly accurate real world physics based flight modelling provided by AvHistory, created using AvHistory.org's USAF DATCOM based 1% Aerodynamics, Stability and Control aircraft development software.*
- *Custom engine damage and aircraft system modelling.*
- *Drop tank and bomb payload.*
- *Highly detailed and fully functional virtual 3d cockpit*

- Detailed and accurate set of German 3d gauges.
- Working reflector gun sight.
- Custom tailored engine and cockpit sounds.

### ***Installation:***

*After you have downloaded the executable file to a temporary location on your Computer, locate and double-click "classics-hangar\_fw190a5\_a9.exe" and follow the on-screen prompts which will guide you through the installation process.*

### ***Texture Configuration***

#### ***Exterior textures:***

*The exterior textures are created in a 2048 by 2048 pixel resolution to allow for a higher detail than the default FSX textures while at the same time keeping the all over number of textures low to maintain good performance.*

*Enabling FSX to make full use of these high resolution textures requires a little editing to the FSX configuration file. After the installation is complete please proceed as follows.*

*Option 1: A free utility going by the name Texture Max Load Editor that can do the required changes for you is available at <http://www.frostysoftware.com/>*

*Please note that Classics Hangar is not affiliated to Frosty Software and that we cannot provide support for this tool!*

#### ***Option 2: Editing "by hand"***

##### ***XP Users:***

*Make sure that Windows is configured to display hidden folders.*

*Open an Explorer window and browse to a file called fsx.CFG.*

*This is usually located at*

*C:\Documents and Settings\User name\Application Data\Microsoft\FSX\fsx.CFG*

*open the file using a text editor and locate the following line:*

*TEXTURE\_MAX\_LOAD=xxx*

*Change the value so that it reads like*

*TEXTURE\_MAX\_LOAD=2048*

*Save and exit.*

***Vista and Windows 7 Users:***

*Make sure that Windows is configured to display hidden folders and that you have administrator rights. Open an Explorer window and browse to a file called fsx.CFG. This is usually located at*

*C:\Users\username\AppData\Roaming\Microsoft\FSX\fsx.cfg*

*open the file using a text editor and locate the following line:*

*TEXTURE\_MAX\_LOAD=xxx*

*Change the value so that it reads like*

*TEXTURE\_MAX\_LOAD=2048*

*Save and exit.*

***Interior Textures:***

*By default the "Fw190A - The Late Variants" comes with a high quality set of textures in 2048x2048 pixel resolution. However, while our default resolution should satisfy most users there is an option to display the major cockpit surfaces in even crisper detail using 4096x4096 pixel resolution textures.*

*Please note this option should only be used if you have a fairly recent PC system that is able to run FSX in conjunction with highly detailed third party add-ons without problems. Note this feature does not require the FSX.cfg's TEXTURE\_MAX\_LOAD entry to be adjusted to 4096. TEXTURE\_MAX\_LOAD=2048 will do fine.*

***How to use:***

*A short cut to the utility is located in Start Menu\Classics Hangar\Fw190A5-A9\ To enable the high detail cockpit textures just click the button "High Resolution" and close the program.*

*If you experience problems with this configuration or you wish to free up some computing resources re-run the program, click on "Default Resolution".*



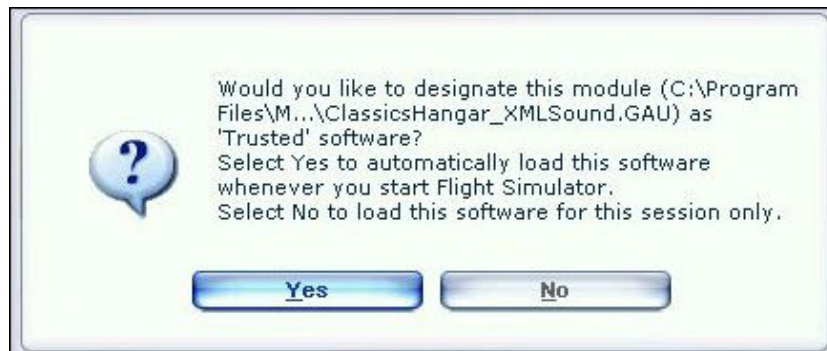
### *First Run:*

*When you start FSX for the first time after installing "Fw 190 A- The Late Variants" a security warning will pop up:*



*Please answer this with "run"*

*In the following dialogue you will be asked if you wish to add ClassicsHangar\_XMLSound.gau to the list of trusted software. Please answer with "Yes".*



### *Repainter Notes:*

*There is a layered paint kit in psd format included to make easier the creation of user made repaints.*

*It's located in "FSXroot\Classics Hangar\Fw190A\_late\Paintkit"*



## Development

### *Fw 190 A-5*

*Changes in fighter tactics required more and more the use of external drop tanks to increase flight duration, the now more widely use of the Fw190 as a fighter bomber naturally led to an increased use of externally carried bombs.*

*In order to keep the Centre of Gravity intact when flying with external payloads the engine was moved forward by 152 millimetres (apr. 5 inch) on the Fw 190 A-5 and all following "Anton's". Many think this change did a lot to the overall visual appearance of the plane. With the A-5 blind flying and radio navigation equipment was introduced to the Fw 190 increasing the aircraft's capabilities to meet the requirements for a broader range of mission profiles.*

*The pilot could now relate on an artificial horizon and a radio beacon indicator, the AFN-2, though those changes were initially not well liked by the crews, being trained and used to pure VFR flying. The artificial horizon was build into a housing combining a turn coordinator ('Wendezeiger'), a slipball ('Libelle') and an artificial horizon ('künstlicher Horizont') into a single instrument, the Wendehorizont. Three different types of the Wendehorizont from different manufacturers can be identified in the Fw 190 A, all three being technically identical, just differing in visual appearance.*

*Like the earlier variants, the A-5 could be flown with or without the outboard MGFF'M' 20 mm cannons.*

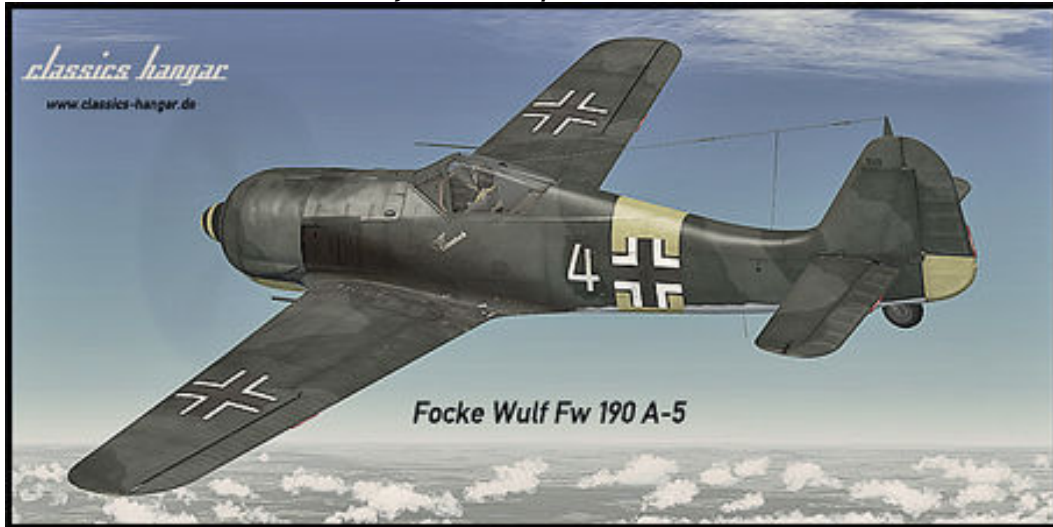
*A number of modifications were tested with A-5 airframes under different "U" designations, amongst them MW-50 Methanol-Water injection, a "wet" emergency power to increase performance for a limited period of time. Trials proofed unsuccessful so that MW50 was never used operational in a BMW 801- equipped Fw190 serial production aircraft.*

*Production of the A-5 began by November 1942, approximately 1752 left the factories until August 1943.*

*Fw190A-5 of 2./JG 11, Husum, Germany, Summer 1943.*



*Fw190A-5 of Walter Nowotny, Staffelkapitean of 1./JG 54, Eastern Front 1943.*



*Fw190A-5 of Uffz. Bernhard Kunze of 1./JG 1, Netherlands, August 1943, equipped with MGFF'M' 20 mm outboard cannons*



### *Fw 190 A-6*

*The replacement of the drum-fed outboard MGFF cannons with the belt-fed Mg 151/20 E led to the introduction of the new Fw 190 A-6 by June 1943. Some other improvements were implemented such as increased armour around the oil cooler, however the only visible differences were the longer MG 151/20 barrels and their under wing access hatches which were differently shaped on each wing, empty shells now being ejected outwards.*

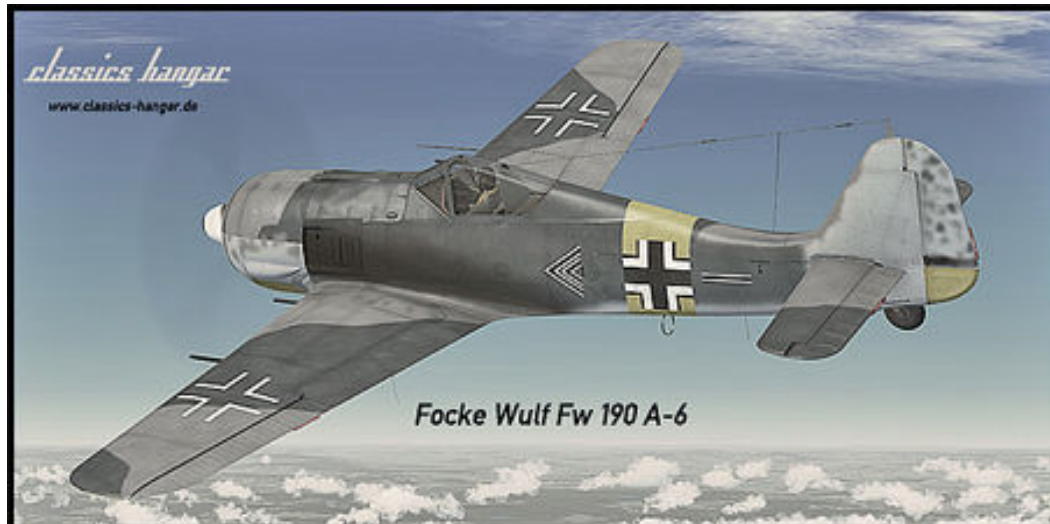
*During the production course the main wheels were replaced with new types and a gun camera was often seen on the left wing's leading edge. The PR 16 Loop Antenna was a regular sight from late 1943 onwards and the pilot's headrest received two additional support cables. The inner gear doors did no longer retract automatically when the gear was fully extended from the A-6 onwards.*

*Only minor changes were applied to the cockpit to reflect the changes in armament:*

*The MGFF ammunition counter was dropped, the SZK K4 ammunition counter was rewired for use with the four wing cannons, the nose machine guns only used an indicator lamp from now on.*

*The majority of the approximately 1192 Fw 190 A-6 that left the factories until February 1944 served in the defence of the Reich, with the Fw 190 being more and more pressed into the bomber destroyer role.*

*Fw190A-6 of Erich Rudorffer, Kommodore of II./JG 54 Immola, Finland, June 1944.*



*Fw190A-6 of Hptm. Horst Ademeit, Kommodore of I./JG 54, Summer 1944.*





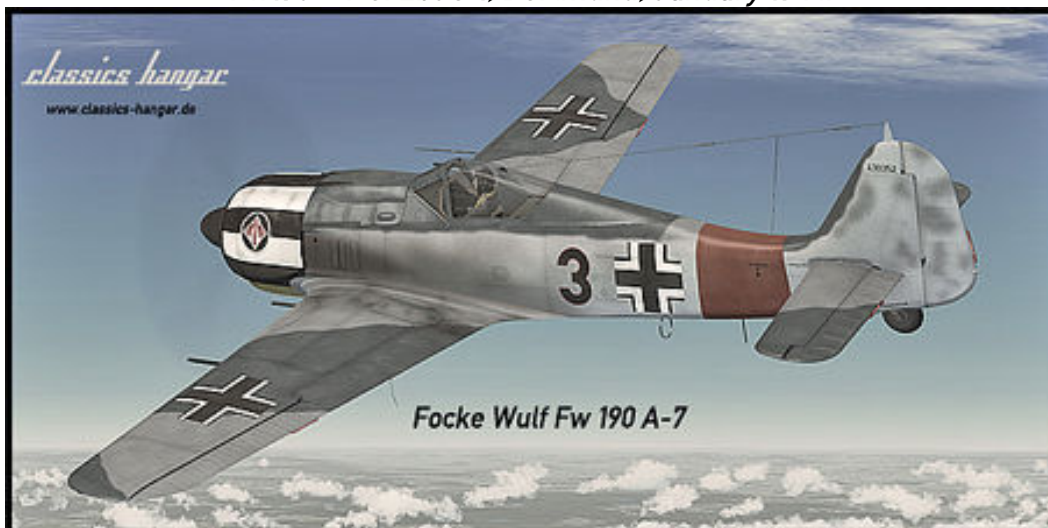
## *Fw 190 A-7*

*The weak fire-power of the 7.92mm Mg 17 – contemptuously nick-named “Luftwaffe-Anklopf-Gerät” by the crews (Luftwaffe-knock-on-the-door-apparatus) was an ongoing source of dissatisfaction. Consequently it had been replaced with the more vital 13mm Mg 131 as it became available, leading to the Fw 190 A-7 production beginning by November 1943.*

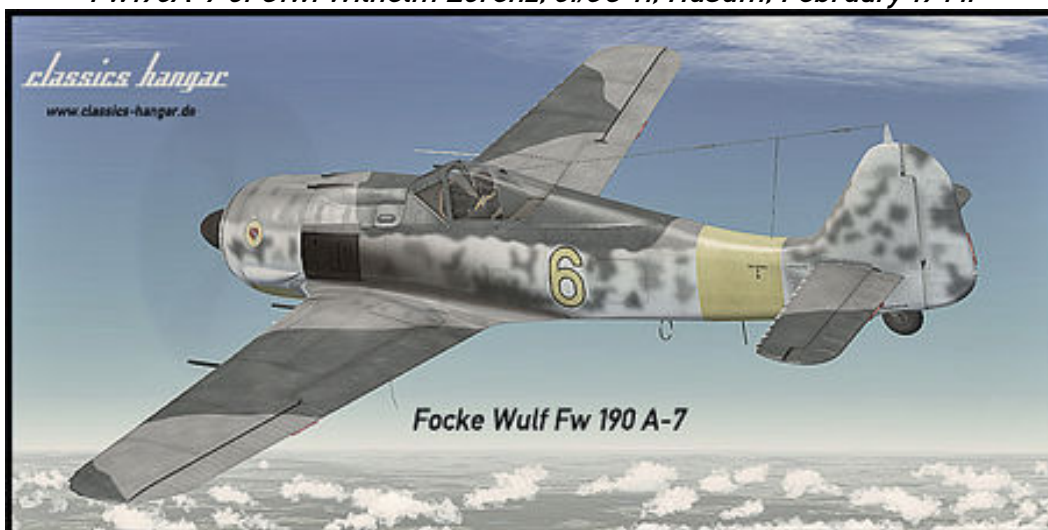
*The considerably larger and heavier Mg131 required changes to the upper nose area of the aircraft: The firing channel’s horizontal distance had to be increased from 200 mm to 260 mm requiring a reshape of the upper engine nacelle, the upper gun fairing now showed some prominent bulges.*

*The cockpit saw a number of changes: The Revi 12 D gun sight was replaced with a Revi 16 B, some of the main flight instruments were replaced with newer types, the left console was simplified, most noticeable the so-called 12-Lampen-Gerät (12-lamp-apparatus, gear-flap indicator) was dropped. Flap indication was now provided by two small mechanical indicators, the gear position was now indicated by a 4-Lampen-Gerät.*

*Fw190A-7 of 2./JG 1, Dortmund, January 1944.*



*Fw190A-7 of Ofw. Wilhelm Lorenz, 3./JG 11, Husum, February 1944.*





## *Fw 190 A-7/R2*

*With the ever increasing allied heavy bomber raids over occupied Europe and German homeland it became apparent that the fire-power of the Fw 190 was not sufficient enough to bring down a 4 engined bomber. It took 20 direct hits of the 20mm ammunition on average to kill a "Viermot".*

*Combat trials were made with various armament configurations, for instance twin MG151 were installed in an external blister under each wing with the Fw 190 A-5/U12 ('Kanonenboot'=gunship'), increasing the armament to 6 MG151 cannons and two Mg 17 machine guns. However trials were of limited success as the blisters decreased the Fw 190's top speed by some 60 kph (37mph).*

*The U12 modification was relatively short-lived and as far as can be told today, only applied to the A-5 variant.*

*A more convincing solution was promised with the implementation of the Rheinmetall Borsig 30mm MK 108 cannon. 3 direct hits from an Mk108 safely downed a four-engined bomber.*

*A first prototype installation was build into the Fw 190 V51, an Fw 190 A-6.*

*The Mk 108 replaced the outboard Mg 151 requiring a re-designed lower access hatch with the shell ejection slot being located inboard of the hatch plus an additional blister on top of the wing.*

*The modification was available in a serial production aircraft from the Fw 190 A-7 onward under the designation "R2".*

*Today there is proof for about 701 Fw 190 A-7 being build to various equipment conditions between November 1943 and March 1944.*

*Fw190A-7/R2 of 2./JG 11, Rotenburg, March 1944.*



## *Fw 190 A-8*

*The Fw 190 A series saw two major changes when the A-8 production began by February 1944:*

*The FuG 16 ZE radio was replaced by the improved FuG 16 ZY and an internally stored auxiliary tank was added, carrying 115 litres (30 gallons) of extra fuel aft of the pilot. The additional tank required the ETC 501 rack to be re-located 200mm forward to keep the Centre of Gravity intact. The Aux Tank could also be adopted to carry GM-1, an oxygen mixture that improved combustion above the engine's critical altitude. However, there is currently only proof for 11 aircraft being build to so-called "R4" conditions so "wet" emergency power continued to play no role with the BMW 801 equipped Fw 190 A.*

*The pitot tube was re-located outboard to the right wing tip.*

*Some other changes were implemented during the production run, all of which are erroneously associated with the A-9 only or the F-8 fighter bomber in older literature: A solid metal roll bar was implemented into the canopy, nick-named "Furchenzieher" (furrow puller), requiring a redesign of the canopy's plexi glass to a more bulged shape which was instantly well received by the crews.*

*The metal propeller was more and more replaced by a wooden "paddle blade".*

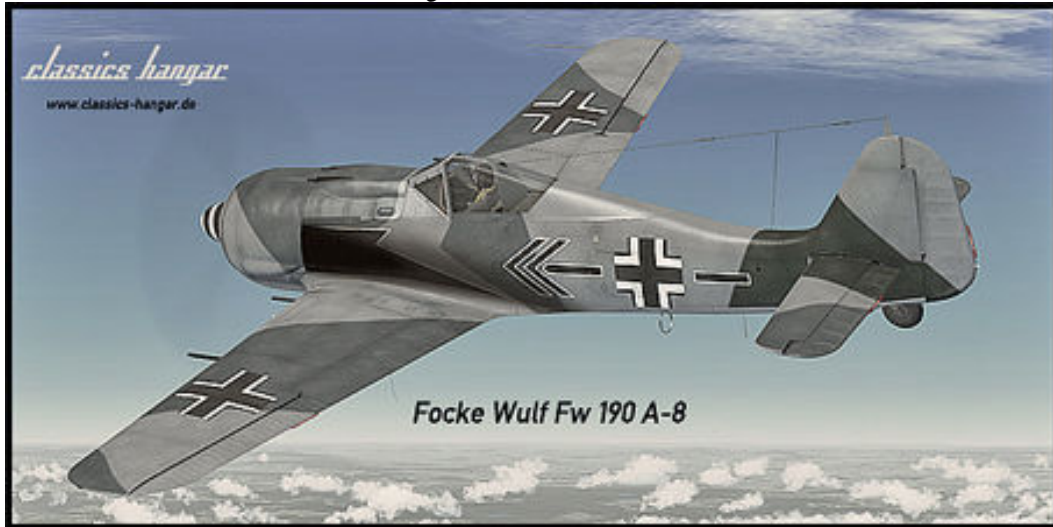
*Some Fw 190 A-8 received the improved BMW 801 TU engine, basically a BMW 801 D-2 motor with peripherals (oil cooler, exhaust stacks etc.) collected from projected BMW 801 developments that did not materialize in time. The BMW 801 TU was equipped with "erhöhte Notleistung" (augmented emergency power), a "dry" emergency boost allowing to over-boost the engine for a limited period of 10 minutes up to the critical altitude of about 5500 meters, delivering 2050 PS/2021 HP (not to confuse with C-3 fuel injection as used in F and G fighter bombers at low altitude).*

*The cockpit received a considerable overhaul. Most noticeable the addition of a variometer gauge to the main panel. The AFN-2 beacon indicator was moved from the main panel to a location right of the Revi 16 gun sight whereas the clock, previously occupying this space, was moved to the forward right console. The right console saw some rewiring with many of the electrical fuses and switches being relocated and a switch for the aux tank's fuel pump added.*

*The left console received some further simplification in that the mechanical flap indicators of the A-7 were now dropped without replacement, limiting flap position control to just the mechanical indicators outside of the cockpit on top of the wings. The 4-Lampen-Gerät was dropped as well, being replaced by four simple lamps indicating the main gear position, mounted directly into the left console. The FuG16 radio's remote controls were re-designed as well.*

*With approximately 6655 aircraft leaving the factories between February 1944 and January 1945 the A-8 was by far the most produced Fw 190 of all types.*

*Fw190A-8 of Kurt Buehligen, Kommodore of JG 2, summer 1944.*

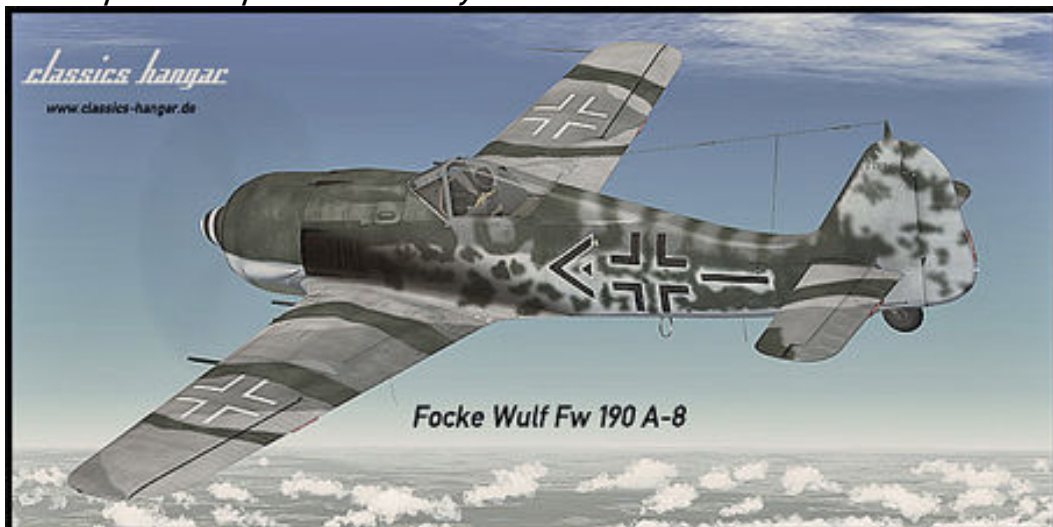


*Fw190A-8 of Uffz. Martin Ullmann, 9./JG 5, Herdla, Norway, March 1945.*



*Fw190A-8 of Major Karl Kennel, Commander of II./SG 2, May 1945.*

*Note the upper wing Mk 108 blisters as seen on some standard A-8 indicating that this plane had provision to carry either MG 151/20 or Mk 108 cannons.*



## *Fw 190 A-8/R2 'Sturmjäger'*

*Much has been written about the "Rammjäger"-Staffeln that had been formed from October 1943 onwards, facts are mixed with glorification and legends and particularly utter nonsense putting the Sturmjäger-Staffeln on the level of a suicide commando.*

*The Sturmstaffeln were made up of volunteers who were self-committed to an "especially brave action against the enemy.....to down a bomber on each sortie.....if needed by ramming." So read the declaration the pilots signed when joining.*

*This of course was far from the combat reality over hostile Europe and of course not every pilot found a good shooting position on each mission but ramming was the absolute exception. The Sturmstaffeln were quite successful as an elite unit though.*

*The special character of the Sturmstaffel mission profile required an aircraft that could take a considerable amount of damage with additional protection for the pilot.*

*The radial engine Fw 190 A seemed well suited for the task so the first batch of Sturmjäger were modified from A-6 serial production fighters.*

*The left and right cockpit sides were fitted with 5mm steel plates, the forward and lower cockpit sides were stuffed with extra armour, too.*

*The triangular side windows were replaced with 30 mm armoured glass and another piece of 30 mm armoured glass in a wooden frame was added to the sliding canopy's sides, nick-named "Scheuklappen" (horse blinkers), considerably hampering visibility. The aircraft's weight increased by some 132 Kg/291 lb so the nose machine guns were often removed.*

*Initially the Sturmjäger modifications didn't use any special designation but were preferably added to the Mk 108 equipped R-2 sub variant before they eventually reached serial production under the designation "A-8/R8" by late 1944. The A-8/R2 Sturmjäger, respectively the A-8/R8 were often fitted with the performance-increased BMW 801 TU. The requirements for extra armour changed over time, steel plates were added to protect the Mk 108 cannons and it's ammunition, the Scheuklappen were no longer called for when the A-8/R8 entered production.*

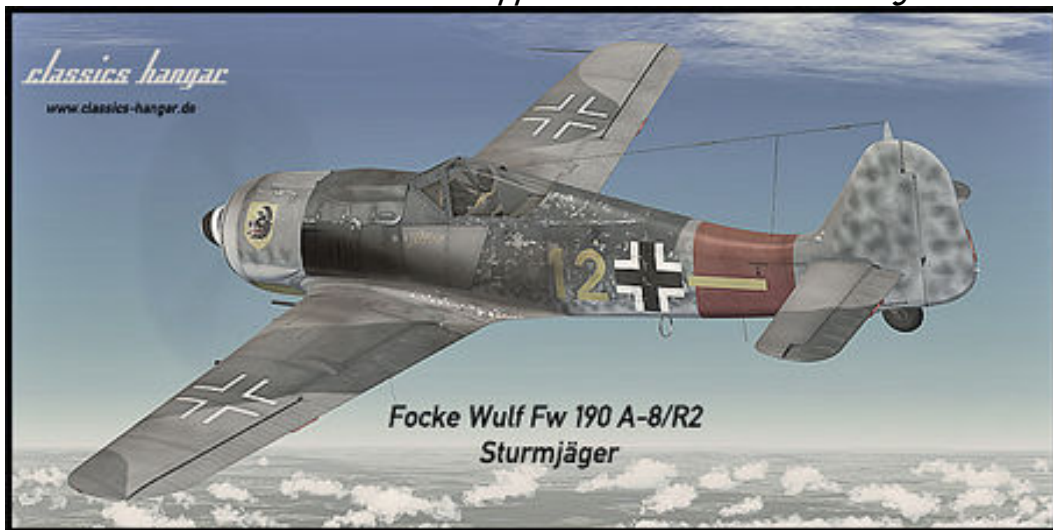
*Fw190A-8/R2 with Sturmjäger modifications of Hptm. Wilhelm Moritz,  
Kommodore of IV. (Sturm) / JG 3, Memmingen, June 1944.*





*Fw190A-8/R2 with Sturmjäger modifications of Uffz Paul Lixfeld,  
6./JG 300 'Wilde Sau', December 1944.*

*Note the absence of the "Scheuklappen" on this and the following aircraft.*



*Fw190A-8/R2 with Sturmjäger modifications of Uffz. Willy Maximowitz,  
IV (Sturm) / JG 3 'Udet'.*

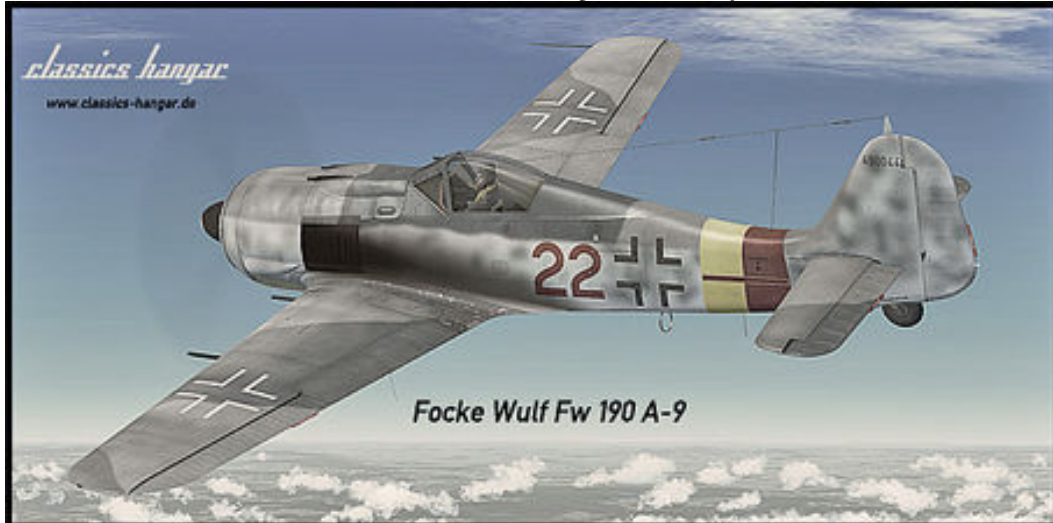


## *Fw 190 A-9*

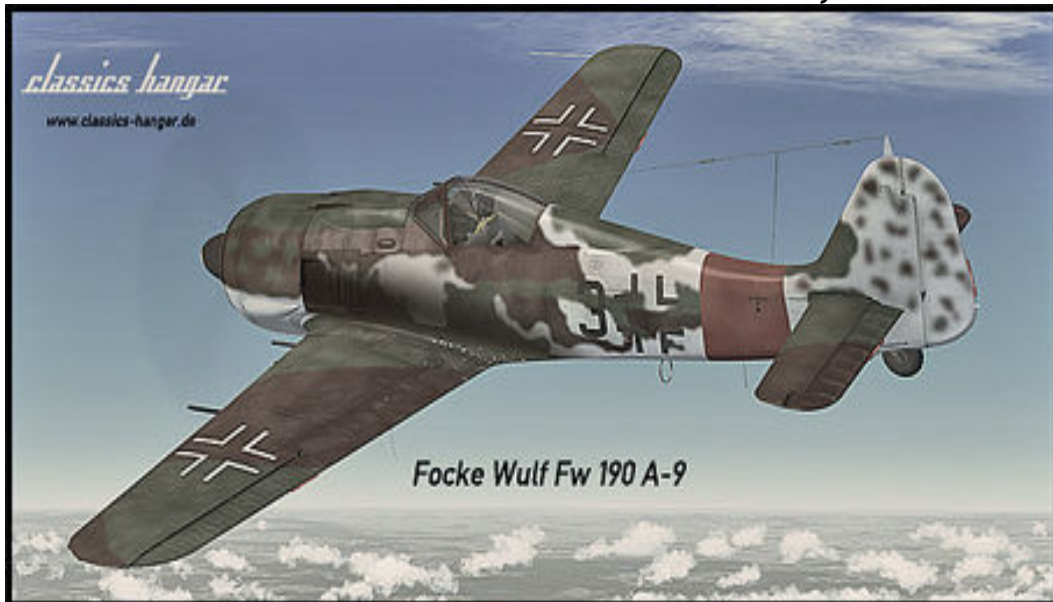
*The final reincarnation of the Fw 190 A series didn't differ visually from the late production A-8. Only difference being the BMW 801 S power egg delivering 2000PS takeoff power at 1.65ata and 2200PS using "erhöhte Notleistung". The 12-bladed engine cooling fan was replaced with a 14-bladed type.*

*Approximately 910 Fw 190 A-9 were built between September 1944 and February 1945 when the Fw 190 A production ended.*

*Fw190A-9 of 6./JG 301, Langensalza, April 1945.*



*Fw190A-9 of Wilhelm Ade, 2./JG 1, Twente, January 1945.*



## *Fw 190 Today*

*The German aircraft restorer and manufacturer Flugwerk G.m.b.H. is currently producing a lovingly recreated version of the Fw 190 A-8 under the designation "Fw 190 A-8/N" in small numbers, the "N" indicating "Neubau" = new construction. The first flying examples were the Air Show Stars over Europe in 2009. For more information visit:*

*<http://www.flugwerk.de>*

## *The Cockpit*

*This is a fairly well structured and logically arranged office. Almost everything is driven and controlled electrically. The pilot's workload is reduced to the absolute minimum thanks to the so called "Kommandogerät", a kind of early analogue computer based on barometric conditions and throttle position, which controls all engine and propeller related tasks such as setting spark points, mixture, prop pitch, loader stages and rpm, just by working the throttle.*

### *Operating the FS Aircraft*

*First, the aircraft can be started with CTRL+E if you choose so but you won't get very far if you leave it at that. The aircraft systems require some attention in order to work correctly, fuel should be burned in the correct sequence if you don't want to end your flight prematurely with 100 gallons of unusable fuel, the altimeter's operational limits should be taken serious and the engine deserves some special care.*

*There is no working 2d panel included.*

*The virtual 3d cockpit is fully functional and it's visual quality should satisfy even the most critical FS addict. All gauges and instruments are entirely modelled in 3d. The textures are created using the latest industry standard rendering technologies, giving a depth and sense of "being in the cockpit". The aircraft can be entirely operated with the mouse from within the virtual cockpit.*

*In the following we will discuss the technical/procedural details of operating some specific cockpit systems in the aircraft.*

*Detailed start-up and flying procedures can be gathered from the in-flight check-lists and references.*

*All gauges are in metric units, the labels are naturally in German language. However, to serve an international audience, all buttons, levers, gauges and labels show an English language tool tip when holding the mouse over them. All flight and engine gauges display a tool tip in international units.*

*Farther on in the handbook is a description of the most important gauges which also includes an "over the thump" Metric/International unit conversion so that the international user should become accustomed to the metric system fairly fast.*

*Most systems are operated straight forward, however the radio, fuel usage, gear, trim and flap operation may require a closer look and some practice to getting used to. This is explained farther on in this document.*

*Most buttons and levers are operated by a single left click. Some items such as the gear handle or the drop tank release use left click to pull and left-release to release.*

*Multi-position switches such as the bomb selector or the fuel tank display selector use left and right clicks to step fore and back through the positions. Rotating items like the compass rose can be dragged with the mouse or dialled with the mouse wheel.*

*A few items such as the fuses in the rear electrical panel are animated but don't have a specific FS function. This is to find a good balance between realism and usability. You probably don't want to push 20 buttons before your flight instruments work when changing a plane in FS.*

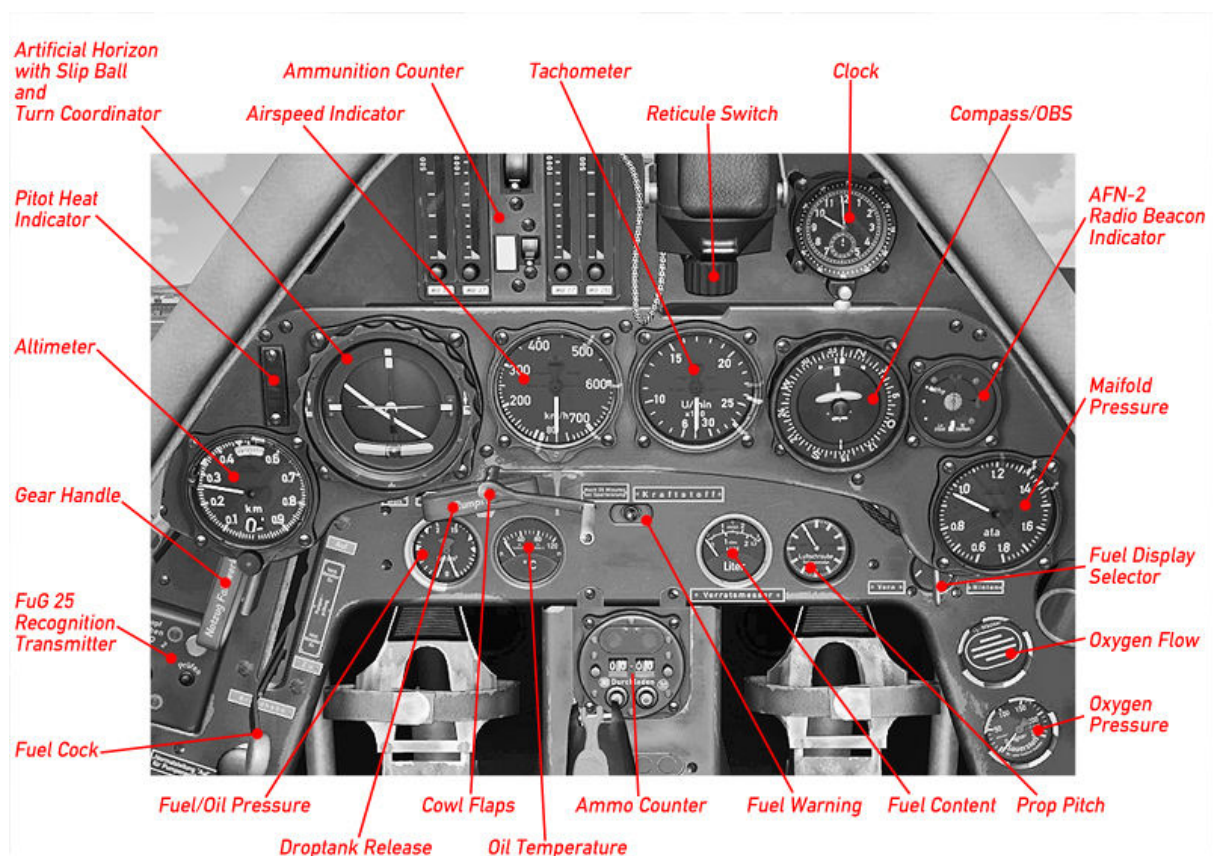
Some buttons and switches may not be easily in reach from within the default virtual cockpit view. To come around this issue multiple camera views are arranged, accessible using the "A" and "Shift + A" keys on the keyboard.

The FuG 16 Radio was only accessible from a service flap on the left fuselage side so frequencies were pre-tuned and accessible by the pilot via some remote controls in the left cockpit console. The pilot only had the option to fine-tune a pre-selected frequency within a limited range. However, we have adopted the wartime cockpit remote controls so that the virtual FS pilot can fully control and tune COM1, COM2 and NAV1 frequencies from within the virtual cockpit, allowing for Voice Communication with the Tower and good old-fashioned VOR to VOR hopping. Since there was no visual indication for the selected frequencies we use the FS tool tip system to gather feedback as you dial the Radios. A detailed How-To can be found farther down in this document. For convenience there's also the default 2d Pop-up Bendix Radio provided.

### Flying at Night

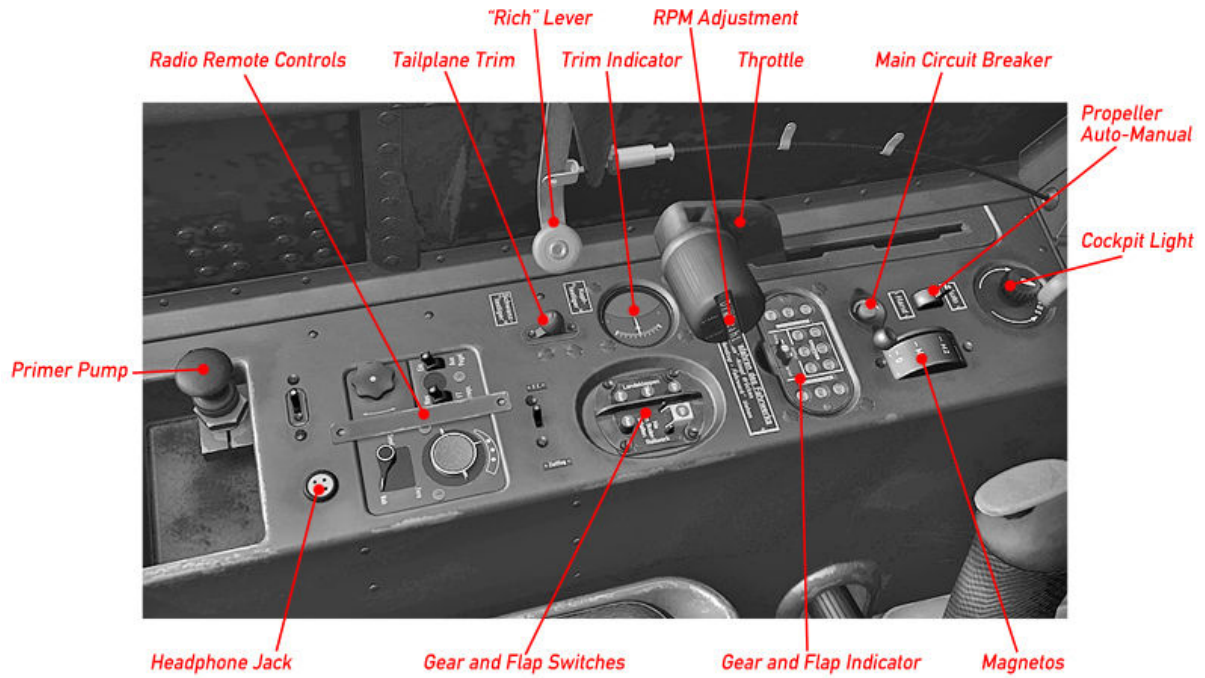
There is no gauge back lighting in the Fw 190. However, dials and labels are painted with "Leuchtpaste", a fluorescent white paint that illuminates with a green glow in the dark.

### Forward Panel Fw 190 A-5, A-6, A-7 (A-7 uses some newer items)

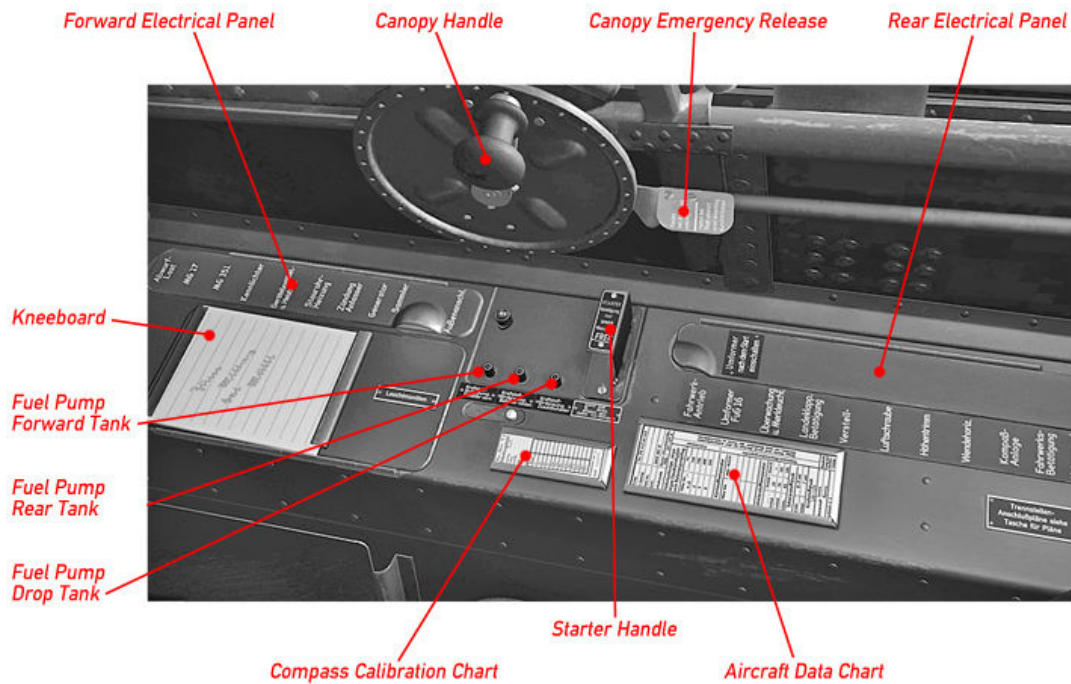




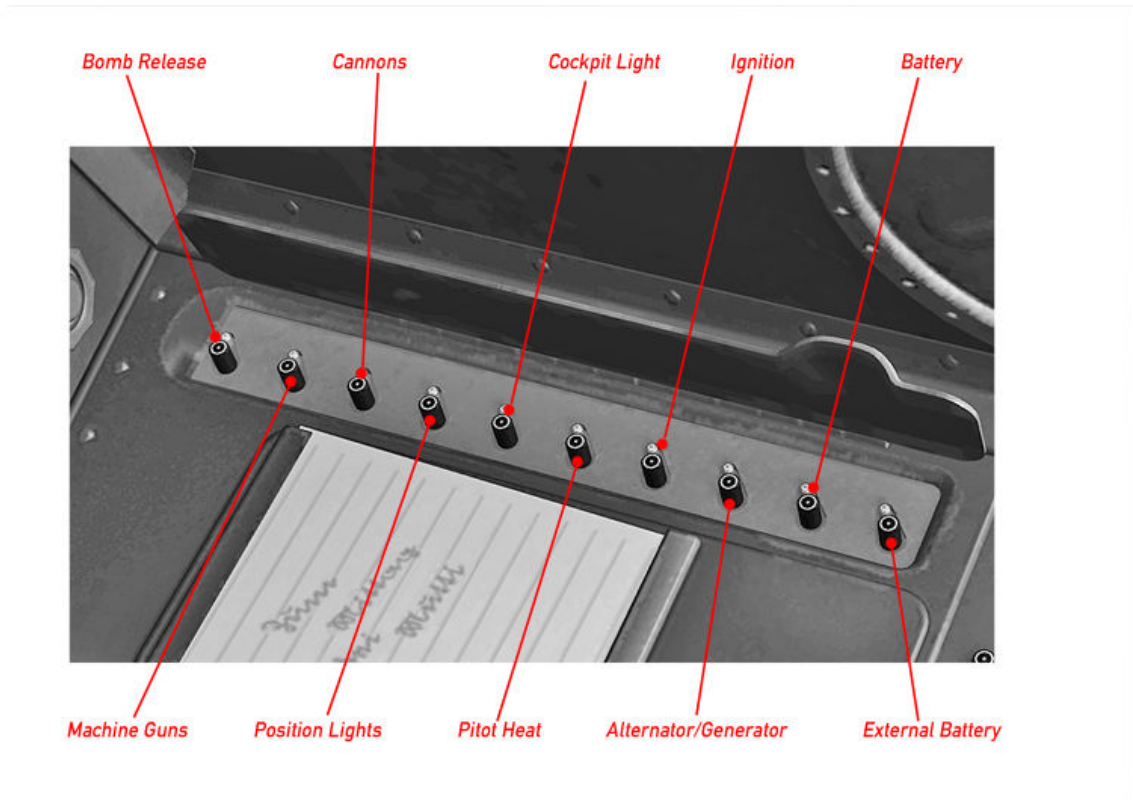
## Left Console Fw 190 A-5, A-6



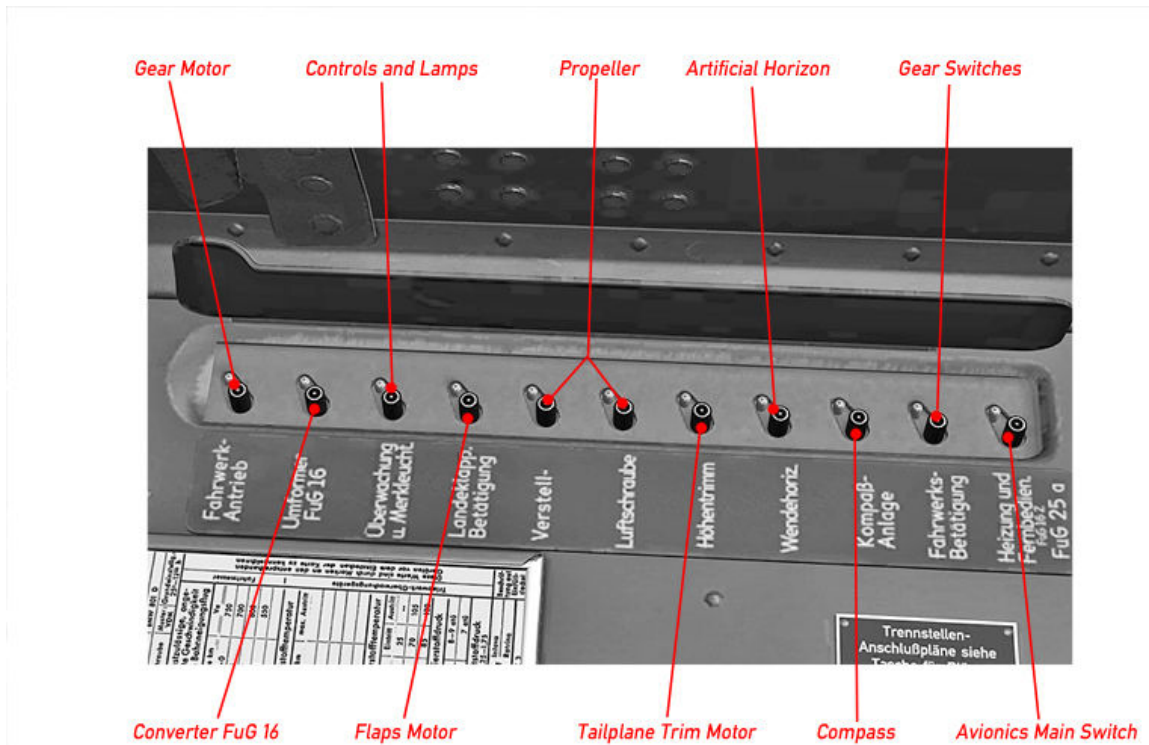
## Right Console Fw 190 A-5, A-6, A-7



**Overview Circuit Breakers and Fuses Forward Electrical Panel A-5, A-6, A-7**



**Overview Circuit Breakers and Fuses Rear Electrical Panel A-5, A-6, A-7**

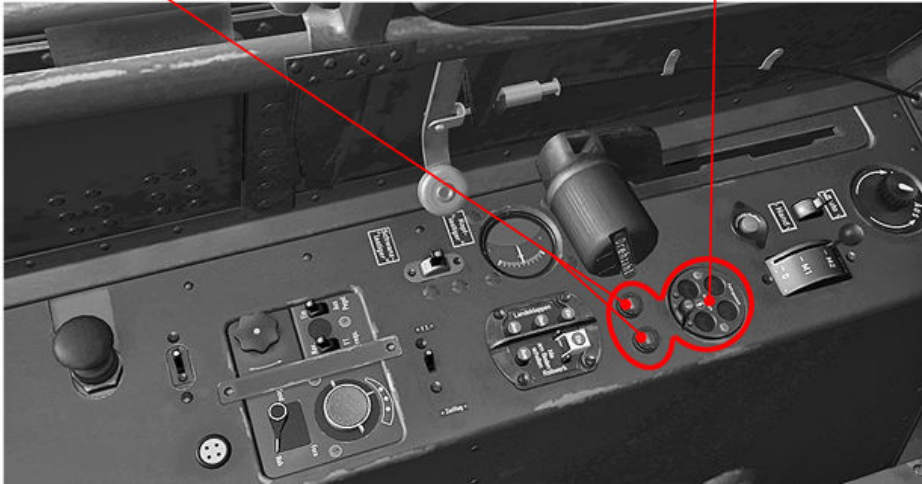


## Cockpit Modifications Fw 190 A-7

### Left Console A-7

Mechanical Flap Indicators:  
Red: Flaps retracted  
Yellow: Takeoff Position  
Green: Landing Position

Gear Indicator  
EIN (red light): Gear retracted  
AUS (green light) Gear extended



## Cockpit Modifications Fw 190 A-8, A-9

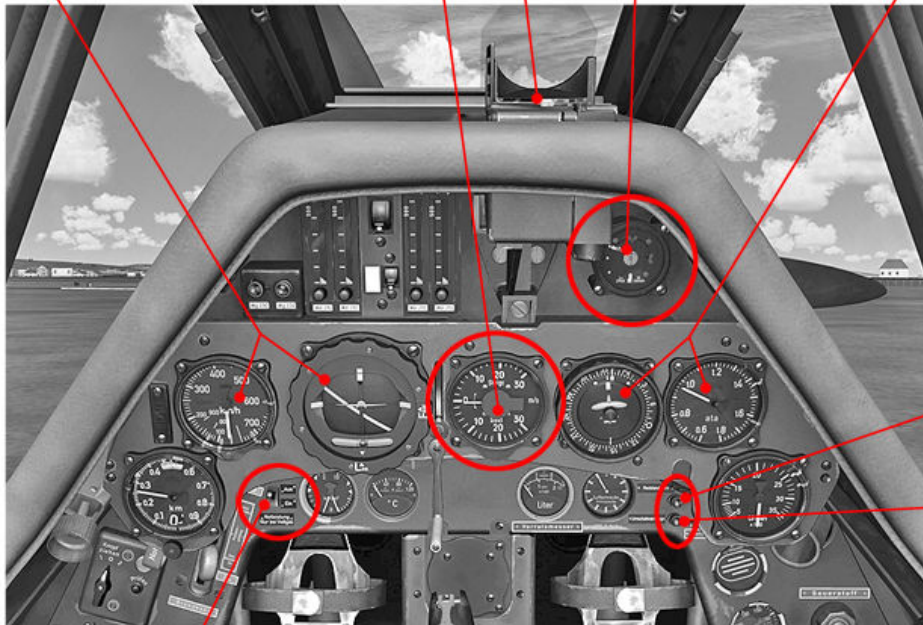
### Main Panel A-8, A-9

Airspeed Indicator and Artificial Horizon  
Location swapped

Variometer  
Revi 16  
(A-7 to A-9)

AFN-2 relocated

Compass and Tachometer  
Location swapped



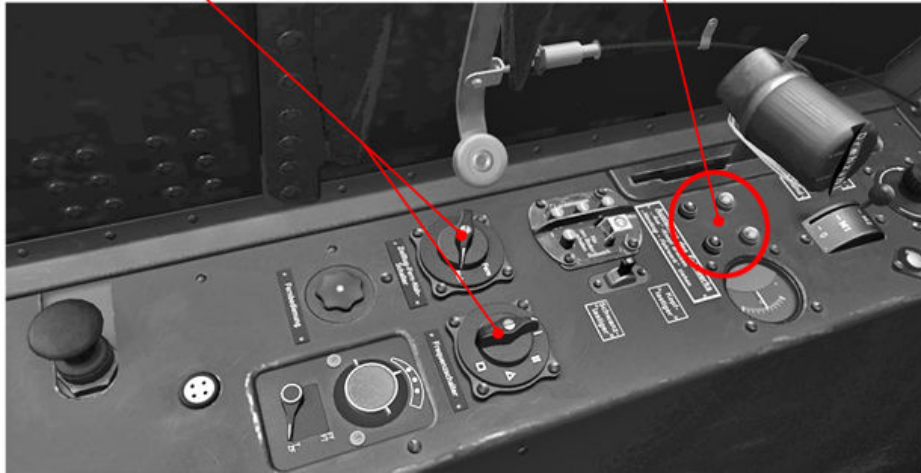
WEP Boost Switch (A-8 Sturmjäger and A-9 only)



*Left Console A-8, A-9*

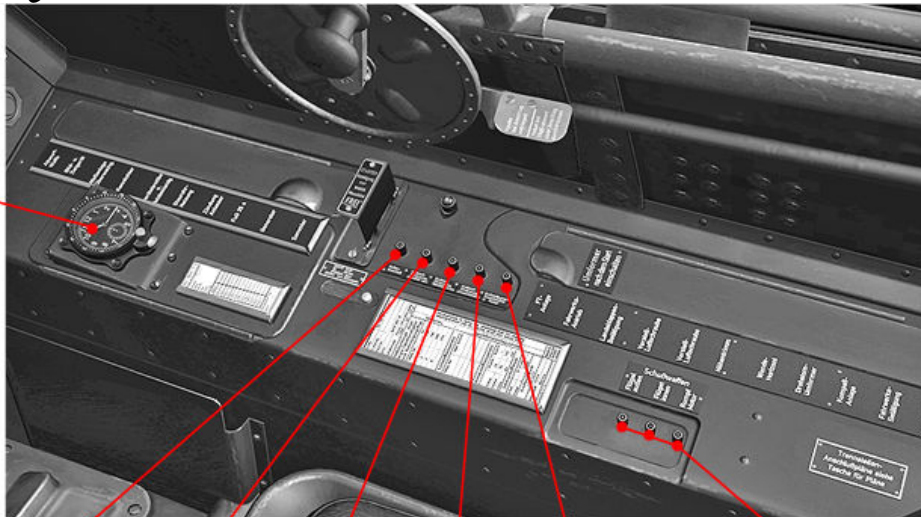
New Remote Controls FuG 16 ZY Radio

Simplified Gear Indicator (Flap Indicators discontinued)  
Red Light: Gear retracted  
Green Light: Gear extended



*Right Console Fw 190 A-8, A-9*

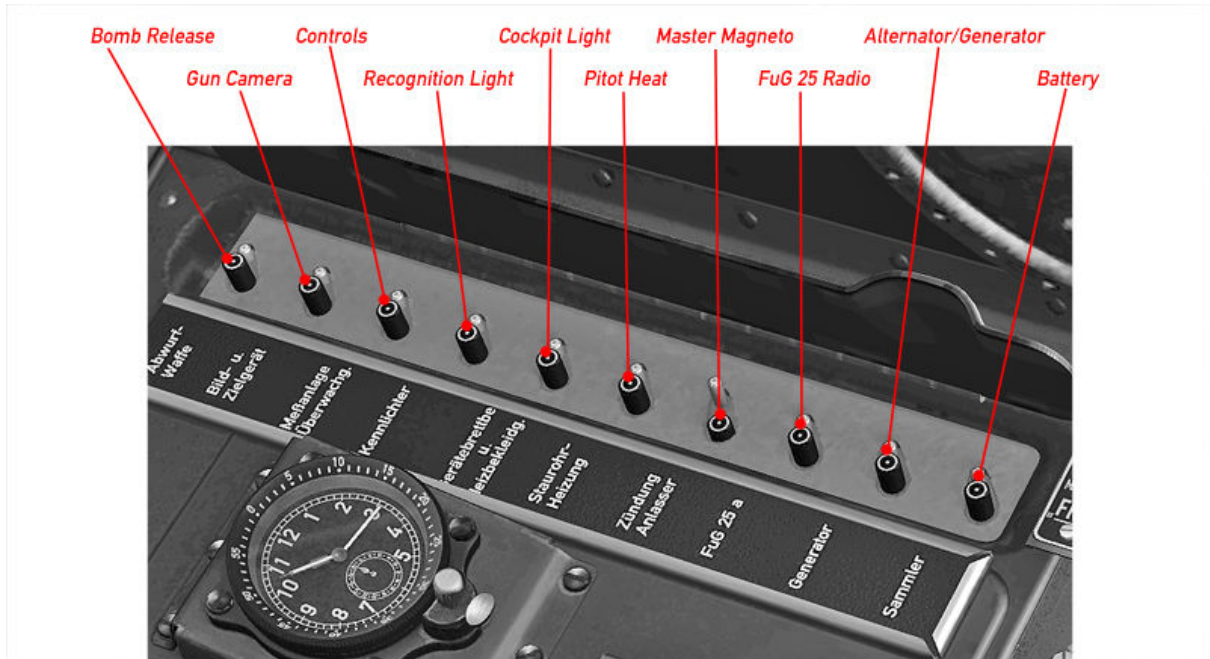
Clock relocated



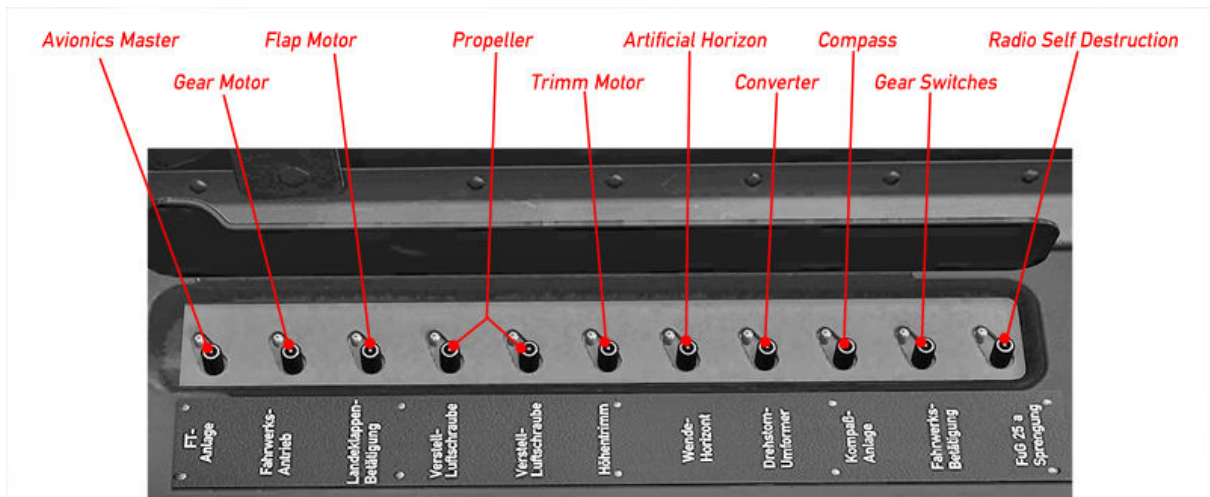
External Battery Fuel Pump Fwrd Tank Fuel Pump Rear Tank Fuel Pump Drop Tank Fuel Pump Aux Tank Weapons Arm Switches



## Overview Circuit Breakers and Fuses Forward Electrical Panel A-8, A-9



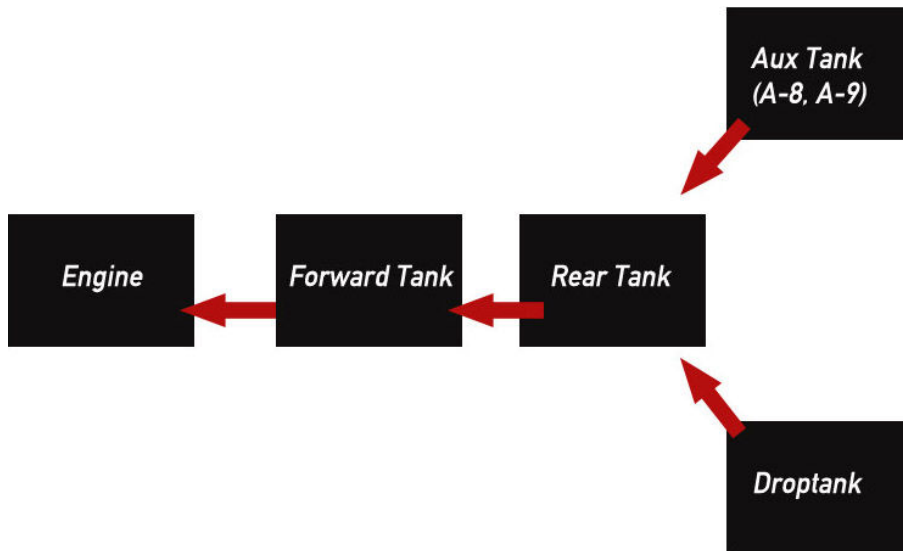
## Overview Circuit Breakers and Fuses Rear Electrical Panel A-8, A-9



## Specific Operation Procedures

### Fuel Management

*The engine always draws it's fuel from the Forward Tank, the Rear Tank feeds the Forward Tank, Aux Tank (A-8, A-9) and Drop Tank both feed the Rear Tank.*



*The Fuel Lever in the lower forward panel opens the fuel valve. The Fuel Content Display (lower Forward Panel) should be set to display Rear Tank Content initially, Switch to Forward Tank Content when all but the Forward Fuel Tanks are empty.*

*The fuel pumps (switches in right console, centre) transfer fuel among the tanks, allowing for a proper fuel circulation:*

- 1.) When flying with internal fuel only (Forward and Rear Tank) both the Forward Tank Fuel Pump and the Rear Tank Fuel Pump are to be switched on. The Rear Tank Fuel Pump is to be switched off as soon as the Rear Tank is empty to avoid that the pump is running dry. Switch Fuel Content Display to Forward Tank.*
- 2.) When Flying with Drop Tank all three the Forward-, Rear-, and Drop Tank Fuel Pump are to be switched on initially. When the Drop Tank is empty, turn off the corresponding Fuel Pump and release the empty Tank (red Lever, lower forward panel). Continue as described in 1.). There is no indicator for Drop Tank Content. The Drop Tank is empty as soon as the Rear Tank Fuel Content begins to drop.*
- 3.) (A-8 and A-9) Flying with Aux Tank, proceed in the sense as described under 2.)*
- 4.) (A-8 and A-9) Flying with a full fuel load (Forward, Rear, Drop Tank and Aux Tank) The Aux Tank should be used first so that a somewhat unappreciative CoG shift due to the extra fuel can be compensated. Forward-, Rear- and Aux Fuel Pumps on initially until Aux Tank is empty (fuel warning lower forward panel, right hand). Turn Off Aux Tank Fuel Pump, turn on Drop Tank Fuel Pump. Proceed as described under 2.).*

## Gear Operation

The gear is driven by an electrical motor.

As the gear retracts, a pressurized air bottle is loaded which lowers the gear in the event of an electrical failure.

The electrical gear switches are located in the left console fairly at the centre in a combined instrument along with the flap switches (Figure 1).

The gear unlock mechanism (Figure 2) is located left hand in the lower forward panel, labelled "Notzug Fahrwerk".

Retract gear: remove safety cover from switch 2 (Figure 1) and press it.

Extend gear: press switch 1 (Figure 1) to activate the gear motor, next pull the lever (Figure 2) to unlock the gear.

**WARNING!**

Always activate the gear motor before pulling the lever except in an emergency. The gear can no longer be retracted otherwise.

Fig. 1

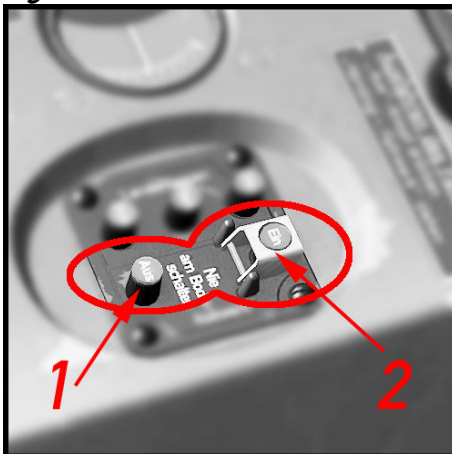


Fig. 2

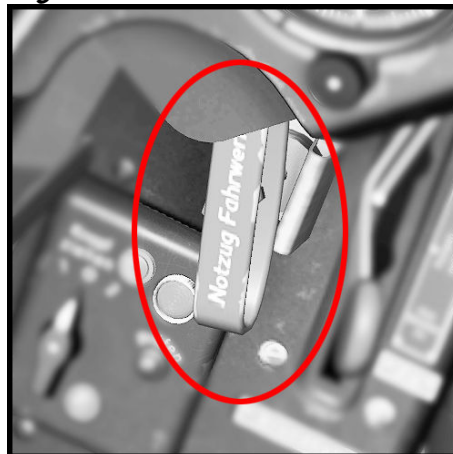


Fig. 3

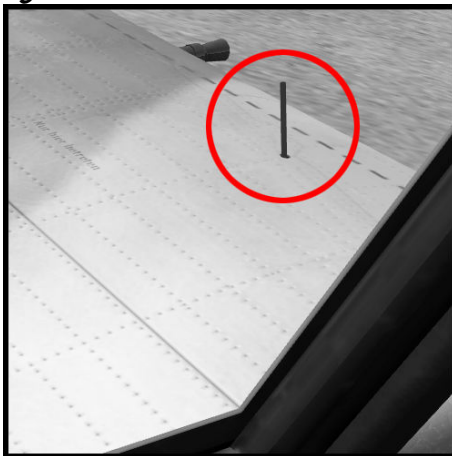
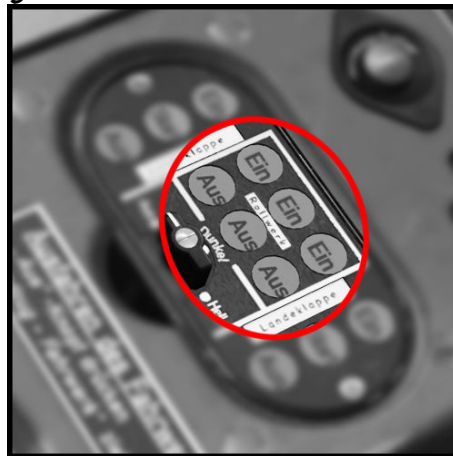


Fig. 4



Status indication is provided mechanically on top of the wings (Figure 3) and electrically by a combined gear/flap indicator (Figure 4)

"Ein" Red light = Gear up

"Aus" Green light = Gear down

## Flaps Operation

The flaps are operated electrically by push buttons in the left console.

Button 1 (Figure 1) Landing 60°

Button 2 (Figure 1) Take-off 12°

Button 3 (Figure 1) Fully retracted

Status indication is provided mechanically on top of each wing (Figure 2) and electrically by a combined gear/flap indicator (Figure 3)

“Ein”, Red light = fully retracted

“Start” Orange light = 12° take-off position

“Aus” Green light = 60° landing position

Fig. 1

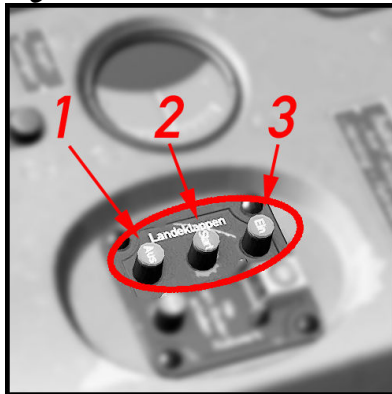


Fig.2

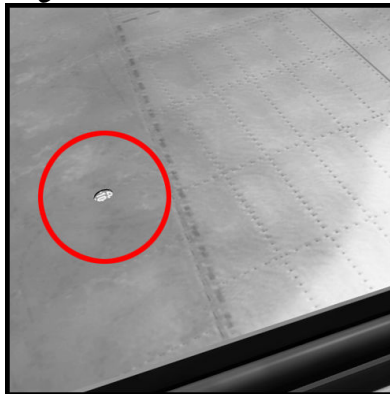
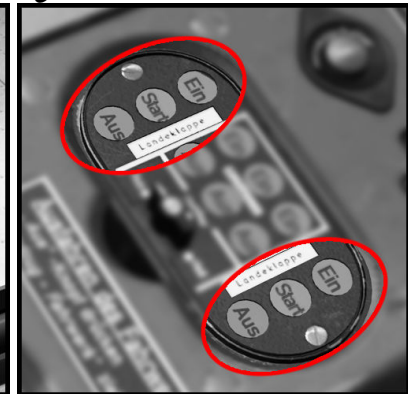


Fig. 3

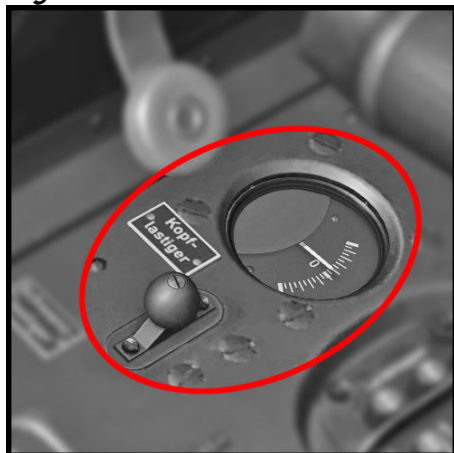


## Trimming

Aileron and rudder trim is not provided and not required. Static trim tabs can be adjusted on the ground to level out production tolerances.

To adjust the aircraft as load changes the horizontal tail plane can be trimmed as a whole by an electrical motor. A See-saw Button (left click-hold, right click-hold) is located in the left console along with a trim indicator (Figure 1).

Fig. 1





## Radio Operation (Fw 190 A-5 to A-7)

The wartime FuG 16 Radio's remote controls in the cockpit's left console are adopted to provide some basic FS functionality from within the 3d environment. Since there were no indicators of any sort we relate on the tool tip function within FS to gather feedback on the switches and dial's status. Whom it is to cumbersome can use the default 2d Bendix radio which is build into the aircraft.

A note on tool tips: There is a known bug in FSX that causes tool tips to not show up when in DX10 preview and full screen mode. Workaround: Toggle Alt+Enter to go to windowed mode.

The avionics main switch is located in the right consol's rear electrical panel.

First let's have a look at the switches (Figure 1):

Switch #1 Toggles COM 1 and COM 2 forth and back.

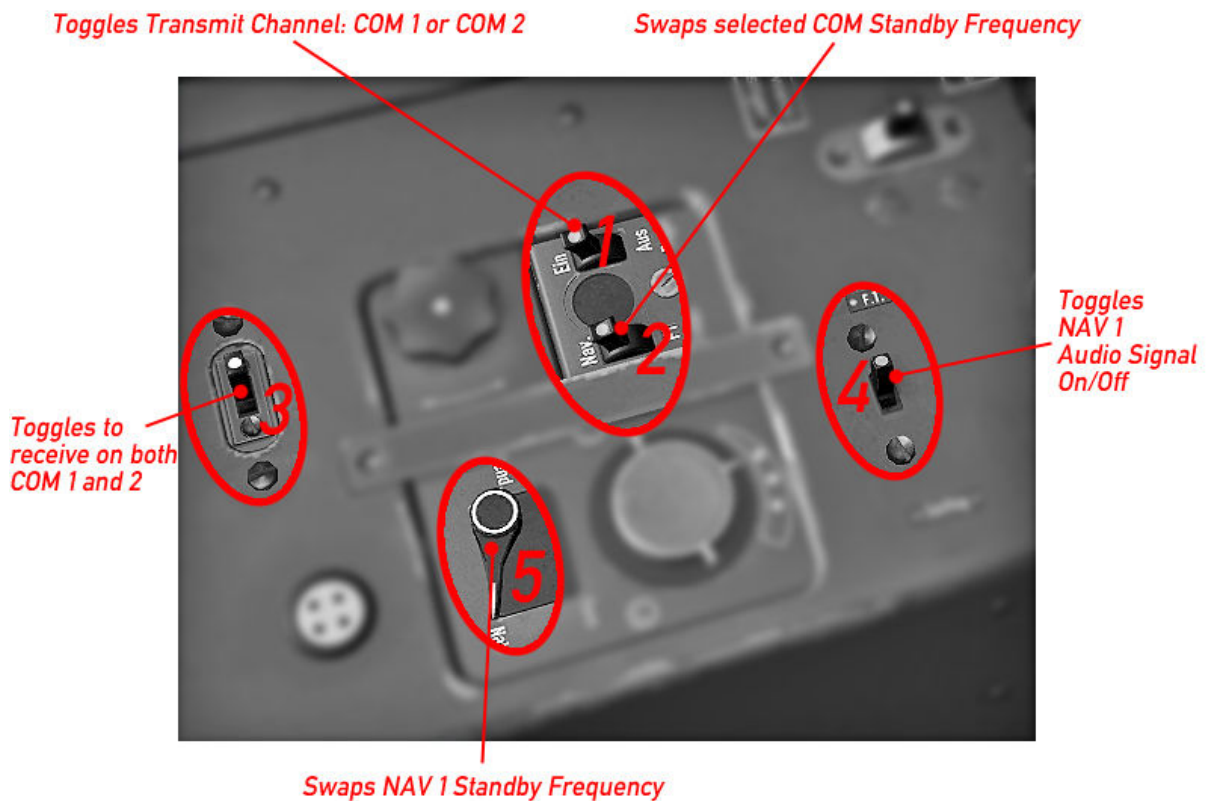
Switch #2 swaps the active Radio's standby frequency.

Switch #3 toggles whether you want to receive on both COM radios or on the active Radio only.

Switch #4 toggles the NAV station's recognition audio signal.

Switch #5 swaps the NAV 1 Radio's standby frequency.

Fig. 1



So let's dial some radio frequencies (Figure 2 and 3):

Figure 2 shows two square rectangles over the dial. These indicate where the mouse rectangles are located. As you hold your mouse over it it should show the selected radio's active frequency as shown in figure 3. Scrolling the mouse wheel changes the frequency. The left mouse rectangle dials the Megahertz Band, the right rectangle dials the Kiloherz Band.

Item 2 is a three-position switch that selects which Radio is active on the dial:

Position 1 : COM 1 Radio is selected

Position 2 : COM 2 Radio is selected

Position 3 : NAV 1 Radio is selected

Fig. 2

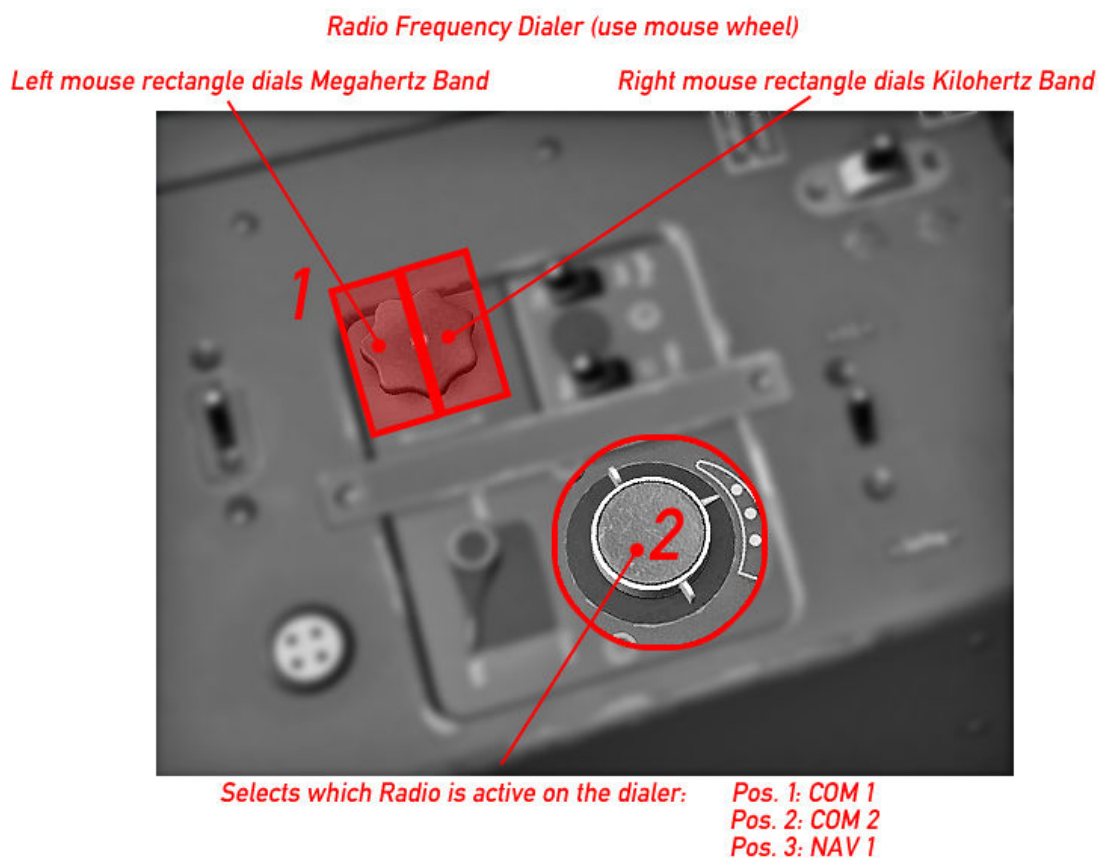
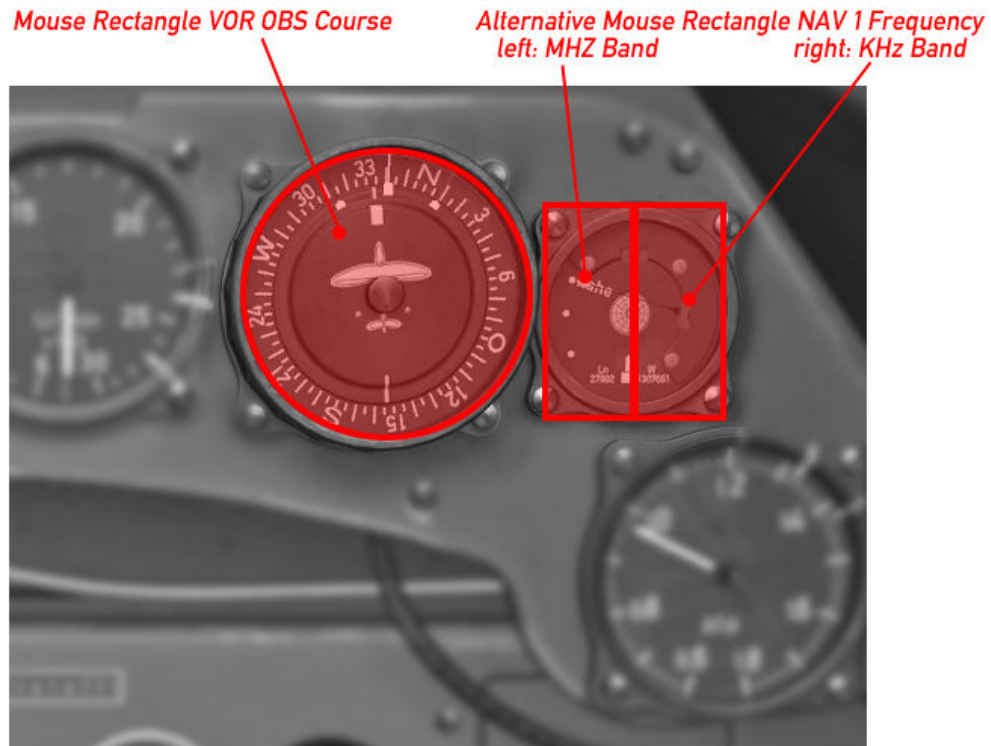


Fig. 3



*The VOR OBS Heading is dialled on a mouse rectangle over the compass glass as shown in Figure 4. The compass rose and AFN 2 direction indicator will adjust accordingly. There are also alternative mouse rectangles over the AFN 2 beacon indicator that dial the NAV 1 Frequency.*

**Fig. 4**



### ***Radio Operation (Fw 190 A-8, A-9)***

*The installation of the new FuG 16 ZY Radio from the A-8 onwards required some of the remote controls to be re-designed. Naturally we had to adopt the FS function buttons in a different way, the functionality remains the same as with the A-5 to A-7 models however.*

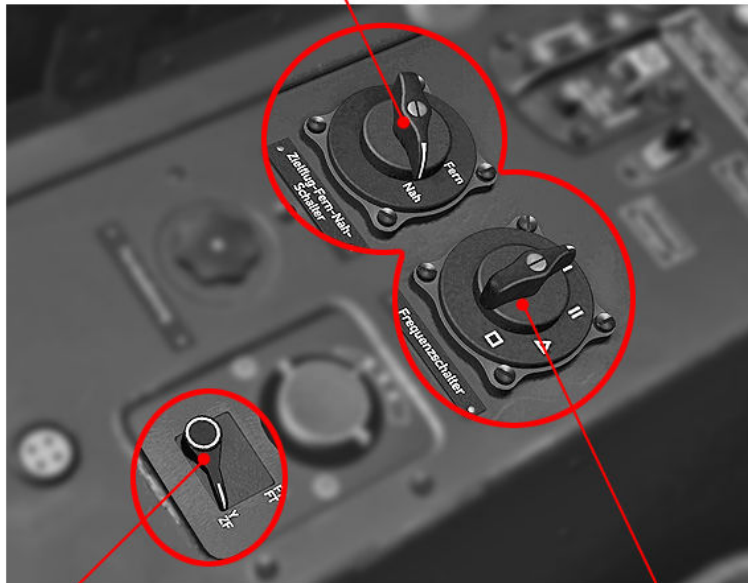
*The COM Select, COM Swap and COM Receive Both Buttons are relocated as shown in Figure 1*

*The NAV 1 Audio Signal and NAV 1 Swap function are relocated to the FuG 25 apparatus in the lower left forward panel as shown in Figure 2.*

*The Avionics Main Switch is relocated within the right console rear electric panel to the most forward position.*

Fig. 1

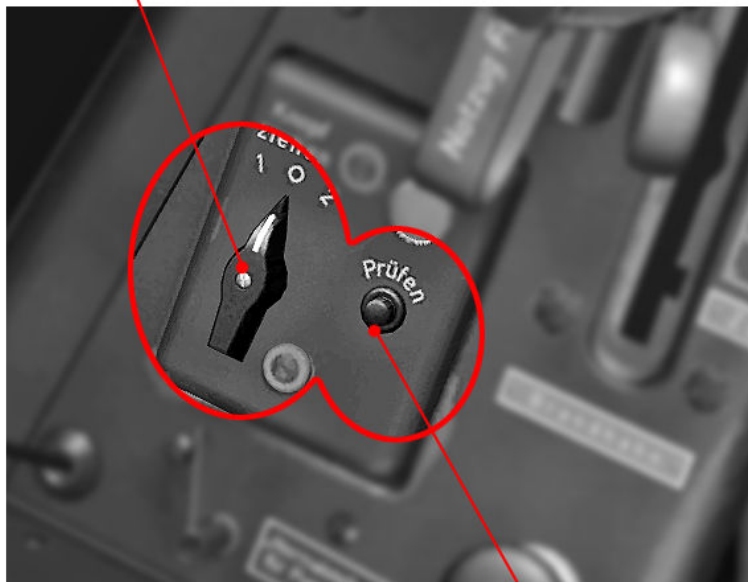
Swaps selected COM Standby Frequency



Toggles to receive on both COM 1 and 2

Toggles Transmit Channel: COM 1 or COM 2

Toggles NAV 1 Audio Signal On/Off



Swaps NAV 1 Standby Frequency

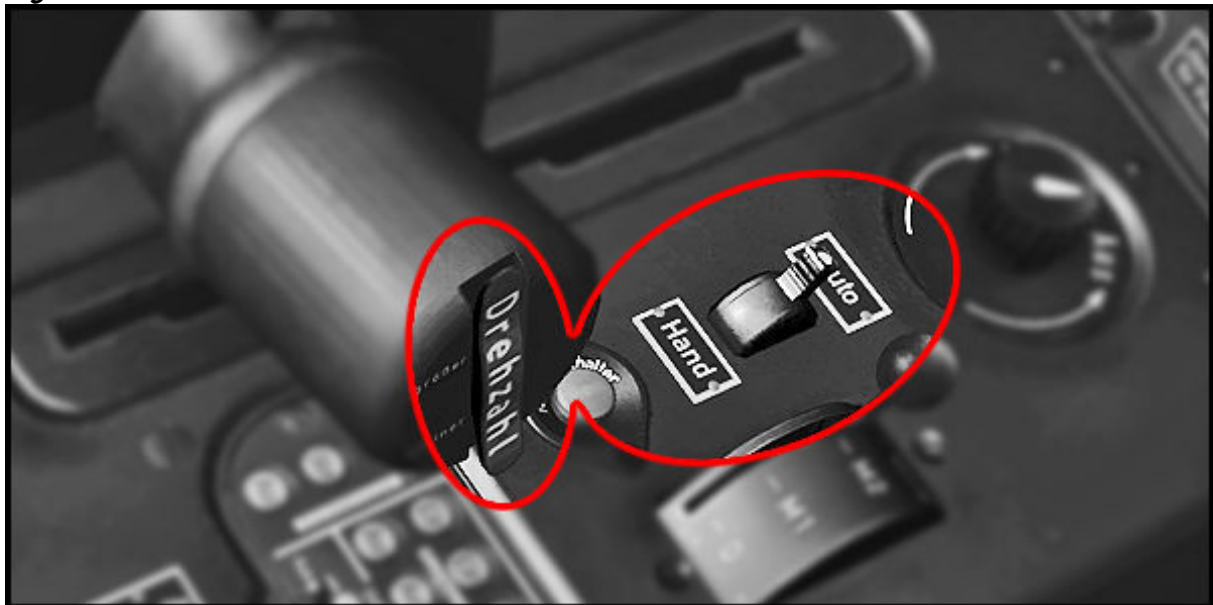


## *Manual RPM Adjustment, Prop Feathering*

*Normally the Kommandogerät takes the burden of adjusting Prop Pitch/RPM off of the pilot. However there may be situations where a manual RPM adjustment is required such as the need to feather the propeller in the event of an engine failure during flight.*

*The aircraft is equipped with a switch that toggles automatic and manual propeller pitch adjustment forth and back (Figure 1). The switch is by default in position "Auto". Switching to "Hand" activates the See-Saw on the throttle lever which is used to adjust Prop Pitch/RPM or to feather the propeller (left-click and hold, right-click and hold). Note when flying in "Hand"- mode the RPM should always be adjusted in accordance to the manifold pressure settings as indicated by the coloured markings on both the Tachometer and Manifold Pressure Gauge! Flying above 2500 RPM in "Hand"- mode should be avoided!*

*Fig. 1*



## *Canopy and Canopy Emergency Release*

*The canopy should be closed during the entire flight (risk of canopy blowing off).*

*In an emergency event the canopy can be blasted using a charge.*

*A red lever is located on the right cockpit wall just aft of the canopy hand wheel.*

*Pressing it once arms the charge.*

*pressing it twice detonates the charge.*

## Main Flight and Engine Instruments



### **Altimeter FL.22320**

*0 – 10.000 meters (32.808ft)*

*Meters Needle, one revolution = 1000 Meters*

*Kilometres Disk*

*Calibration Knob*

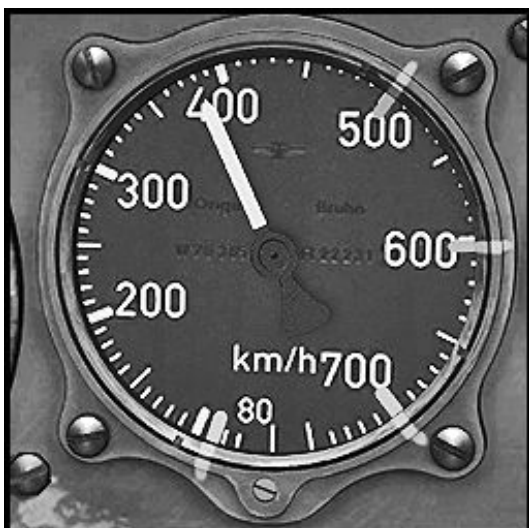
*Barometric Pressure in Millibar*

*Metric Conversion:*

*1.000 Meters = 1 Kilometre = 3.281 ft*

*3.000 Meters = 9.843 ft*

*6.000 Meters = 19.685 ft*



### **Airspeed Indicator FL.22231**

*(A-5, A-6)*

*0 – 750 Kilometres per Hour (466 mph)*

*Metric Conversion:*

*100 kph = 62 mph*

*200 kph = 124 mph*

*300 kph = 186 mph*

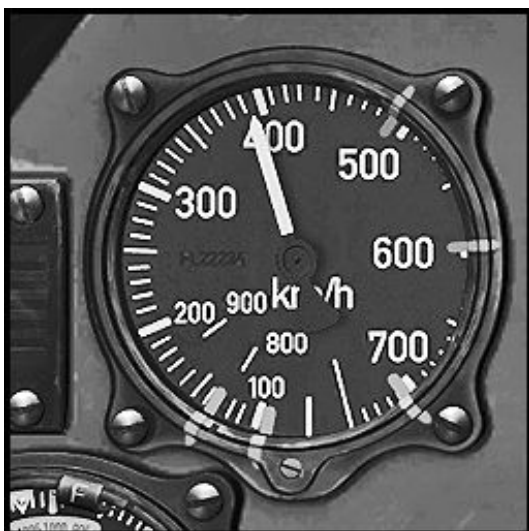
*400 kph = 249 mph*

*500 kph = 311 mph*

*600 kph = 373 mph*

*700 kph = 435 mph*

*750 kph = 466 mph*



### **Airspeed Indicator FL.22234**

*(A-7, A-8, A-9)*

*0 – 900 Kilometres per Hour (559 mph)*

*Metric Conversion:*

*100 kph = 62 mph*

*200 kph = 124 mph*

*300 kph = 186 mph*

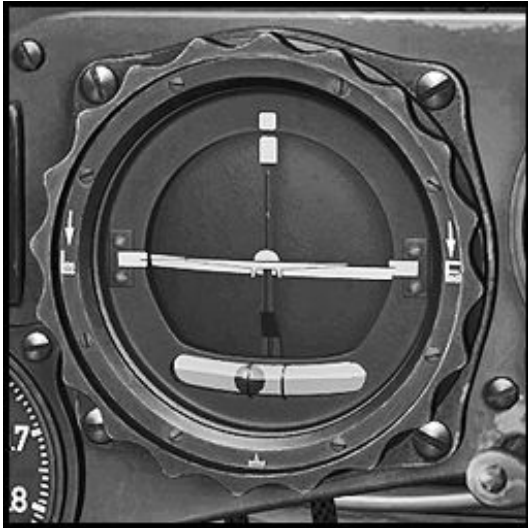
*400 kph = 249 mph*

*500 kph = 311 mph*

*600 kph = 373 mph*

*700 kph = 435 mph*

*750 kph = 466 mph*



***Combined Artificial Horizon,  
Slip Ball and Turn Coordinator***

***FI 22410***

***Fw 190 A-5, A-6***

***Artificial horizon:***

***Locked during Aerobatics!***

***Operational Limits:***

***110° Bank***

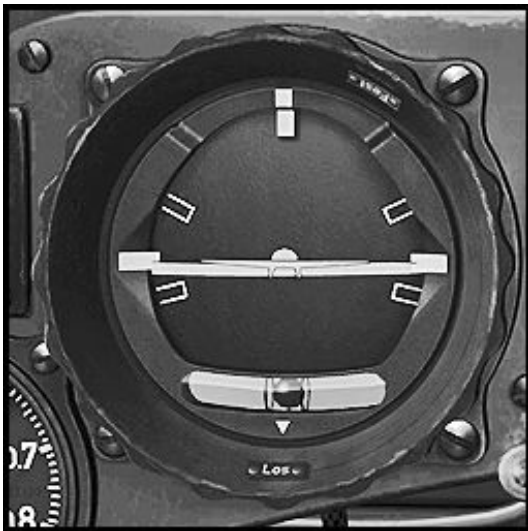
***60° Pitch***

***Turn Coordinator:***

***electrically driven***

***+ - 35° Max***

***One needle width left or right  
equals a standard three-minutes-turn.***

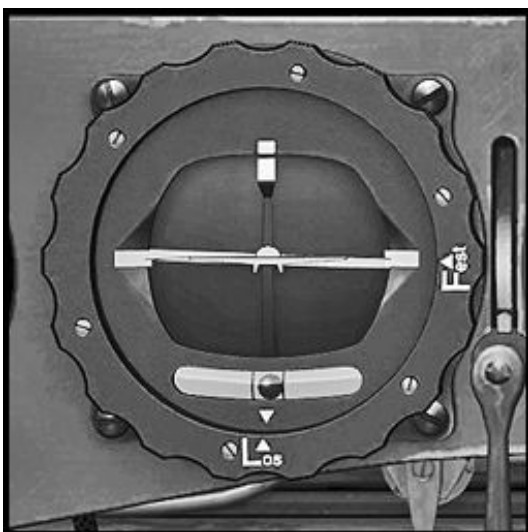


***Combined Artificial Horizon,  
Slip Ball and Turn Coordinator***

***FI 22411***

***Fw 190 A-7***

***Technically like FI 22410***



***Combined Artificial Horizon,  
Slip Ball and Turn Coordinator***

***FI 22415***

***Fw 190 A-8, A-9***

***Technically like FI 22410***



**Heading Indicator FL.23334**  
*electrically driven slave*

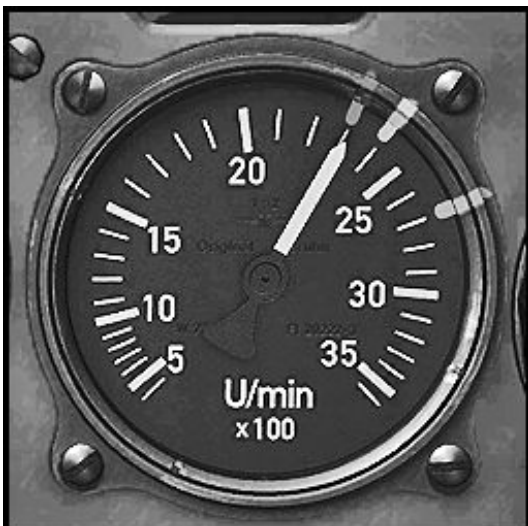
*The aircraft symbol is the rotating part.  
The rose can be adjusted so that the  
desired course points to the top for easier  
readability. Also tunes OBS heading.*



**Tachometer FL.20222-2**  
*Fw 190 A-5, A-6*

*500 – 3000 rpm*

*Markers for Max Continuous, Max Climb and  
Max Takeoff. Note The Manifold Pressure  
Gauge should be used to set power!*



**Tachometer FL.20222-3**  
*Fw 190 A-7, A-8, A-9*

*500 – 3600 rpm*

*Markers for Max Continuous, Max Climb and  
Max Takeoff. Note The Manifold Pressure  
Gauge should be used to set power!*





**Manifold Pressure FL.20555**

*0.6 – 1.8 atmospheres absolute*

*Typical Max Continuous Power setting  
1.15 – 1.2 ata = 34.36 – 35.88 inHG*



**Fuel/Oil Pressure**

*FL.20512-3*

*Left: Fuel Pressure 0 – 2 kg/cm<sup>2</sup>  
Normal operation 1.25 – 1.75 kg/cm<sup>2</sup>*

*Right: Oil Pressure 0 – 15 kg/cm<sup>2</sup>  
normal operation 8 – 9 kg/cm<sup>2</sup>*



**Oil Temperature FL.20342-2**

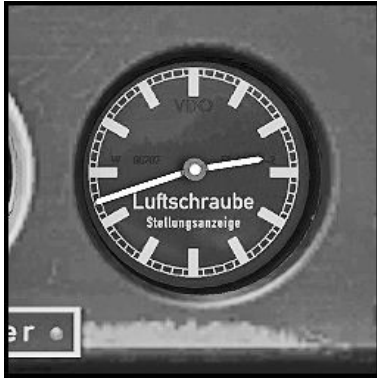
*0 - 120°C*



**Fuel Content Indicator FL.20723**

*Upper dial 0 – 300 litres (rear tank)  
Lower dial 0 – 230 litres (forward tank)*

*Displays either rear or front tank content.  
NOTE: Yellow Selector Switch FL.32331  
to the right of the gauge.*

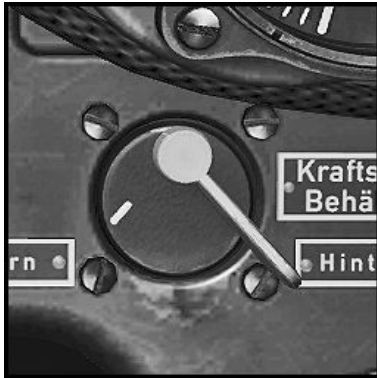


**Prop Pitch Indicator FL.18503-2**

*Works like a clock.*

*12:35 = 25° Pitch*

*10 minutes on the dial equal 1° of Pitch*



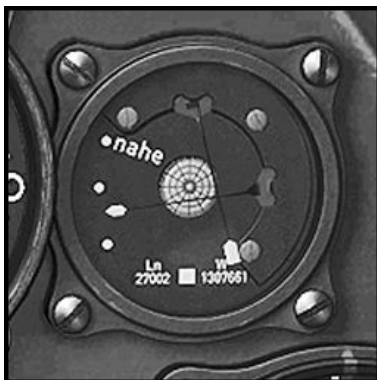
**Fuel Content Display Selector FL.32331**

*Toggles the Fuel Content Indicator to either display Rear or forward tank content.*

*Centre = Off*

*Right (see picture) = Rear Tank*

*Left = Forward Tank*



**AFN-2 Radio Beacon Indicator**

*Ln.27002*

*Vertical needle indicates course deflection*

*Horizontal needle indicates distance to selected VOR station.*

*Indicated range: 60 – 0 nautical miles*



**'Rich' Lever (Anreicherungs zug)**

*Pull this once before engine start to bring the Kommandogerät to start-up conditions.*

*Sets mixture to "Rich" and prop pitch to default angle.*

## Changing or removing Payloads

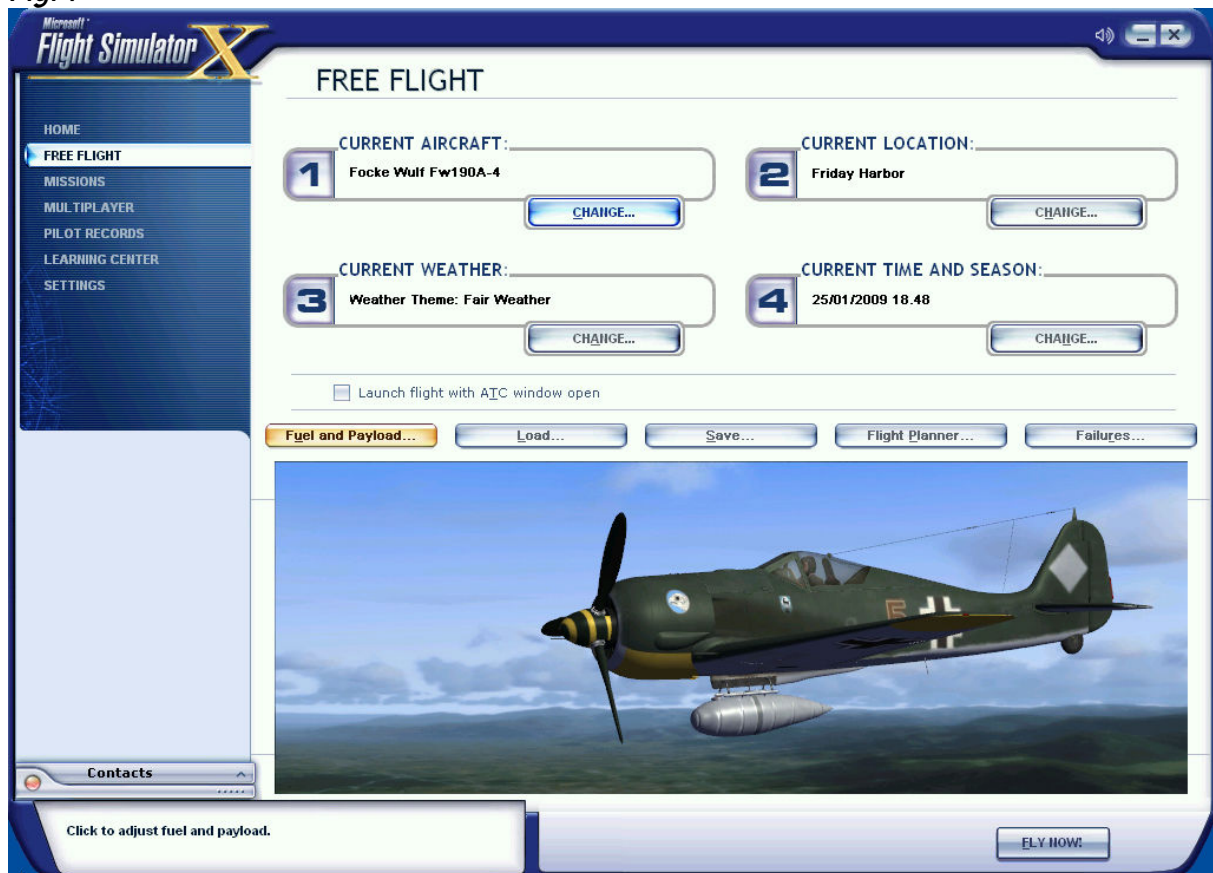
The Fw 190 is by default equipped with a 300 Litres Drop Tank but can be alternatively equipped with an SC 250 bomb or no payload at all using the FS X Payload Editor.

When removing all Payloads the fixed inner gear covers are automatically replaced with retractable gear doors.

Proceed as follows:

- (Figure 1) In Free flight with any of the Fw 190 A selected go to the "Fuel and Payload" screen.

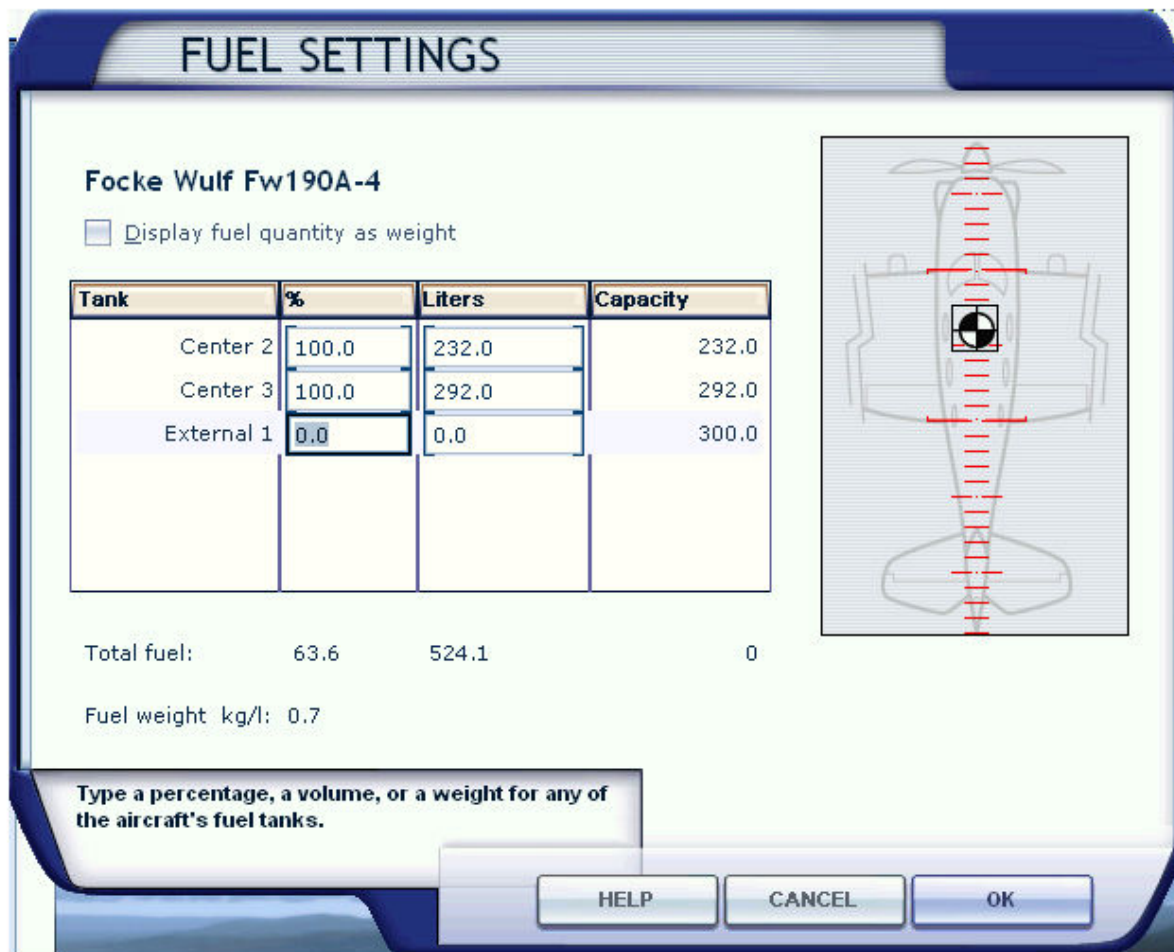
Fig. 1



(Figure 2)

- Click on the "Fuel" screen
- Set "External 1" fuel to zero.  
This will remove the drop tank fuel from the aircraft.
- Close the Fuel screen

Fig. 2

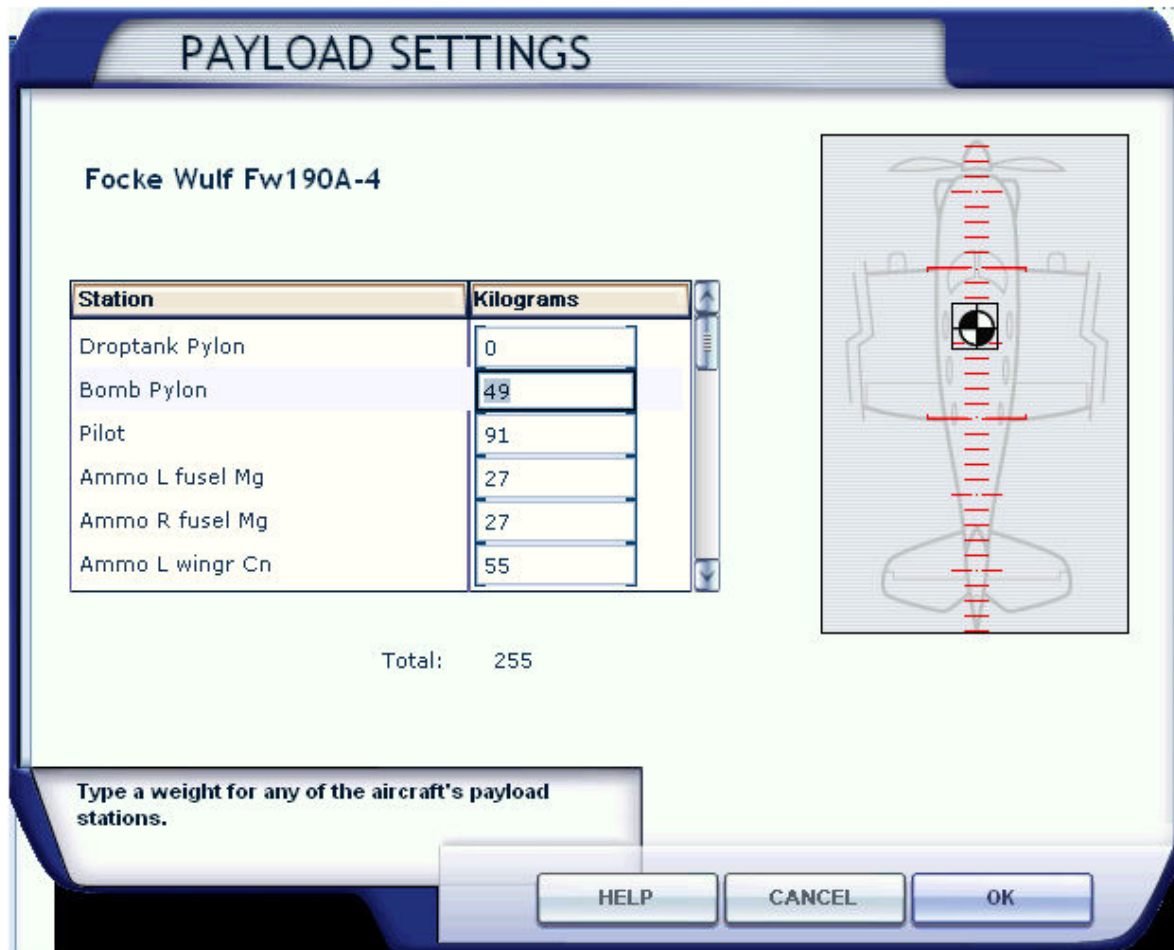


(Figure 3)

- Open the "Payloads" screen.
- Set Station Weight 1 "Drop tank Pylon" to zero ("Trigger" weight is 70kg/154.3lb). This will remove the visual drop tank model and it's pylon. If you leave it at that your aircraft is now configured to carry no external payload at all.
- Set Station Weight 2 "Bomb Pylon" to at least 49Kg or 108lb depending on the units set up you have configured your Simulation to use. This will add the weight of the pylon inclusive apparatuses and makes the bomb and it's pylon visible. If you wish add another 250Kg/550lb to simulate the actual bomb weight  
*NOTE: You won't see the changes in the preview window.  
The bomb will become visible as you start your flight.*



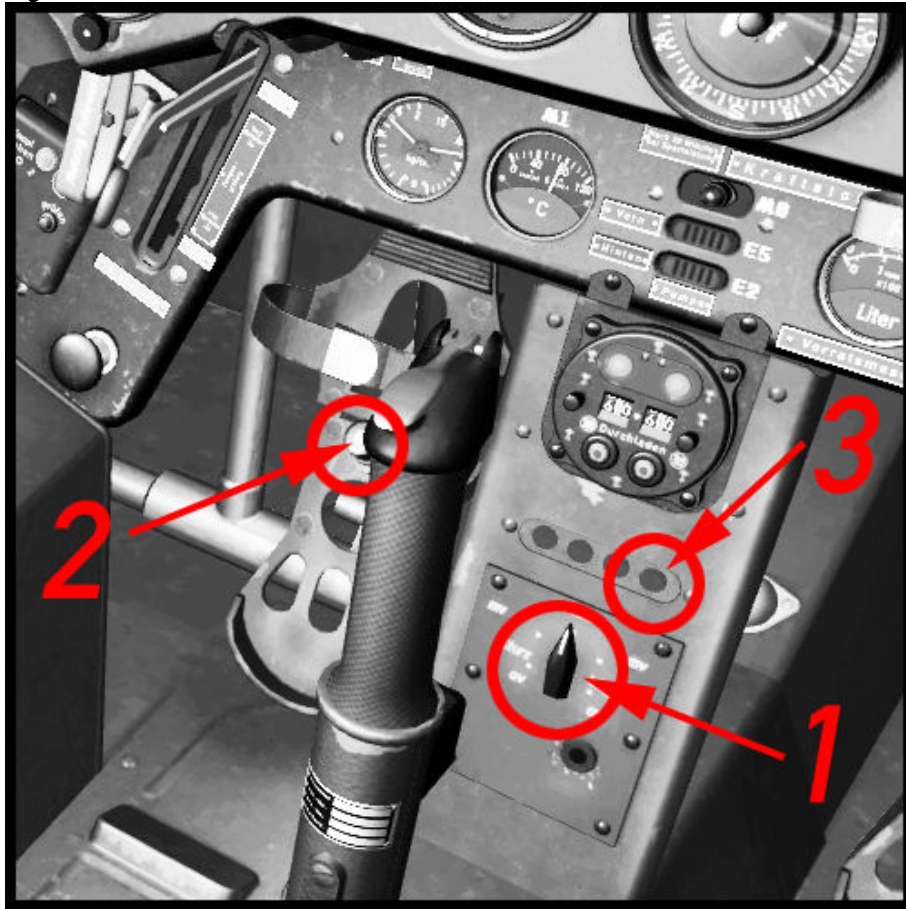
Fig. 3



### *Dropping the Bomb*

- Fuse the bomb using the bomb mode selector switch (Figure 4, Pos. 1).  
Any position other than the default "Aus" will do fine.  
A red light (Figure 4, Pos. 3) will glow once the bomb is successfully fused.
- Release the bomb by clicking fire button 2 on the stick (Figure 4, Pos. 2)  
Using the fire button will also trigger the FS event  
"RELEASE\_DROPPABLE\_OBJECTS"  
so it can be used in mission scenarios to do just that. Note Mission Creators can access the SC250 bomb from the SimObjects\misc folder as a droppable object.

Fig. 4



## *Project Team:*

*Gofer, Project Lead, Visual Models,  
Interior Textures and Programming..... Mathias Pommerien  
Exterior Textures,  
Texture Manager Application..... Alessandro Biagi  
Aero Files..... AvHistory/Gregory Pierson  
Engine Sounds..... Steve Buchanan  
Beta Testing..... Huub Vink, Roger Law*

*Special thanks to Warwick Carter, Chuck Jodry, Bill Leaming and teson1 for their  
invaluable help.*