

Focke-Wulf Fw 191

Le Focke-Wulf Fw 191 est un prototype de bombardier allemand de la Seconde Guerre mondiale. Deux versions étaient destinées à être produites, une version bimoteur utilisant le moteur Junkers Jumo 222 et une variante quadrimoteur qui devait utiliser le moteur Daimler-Benz DB 605, jamais développé. Le projet a finalement été abandonné en raison de difficultés techniques avec les moteurs. En juillet 1939, le RLM (Reichsluftfahrtministerium, Ministère de l'air du Reich) publie une spécification concernant un bombardier moyen haute performance. Il doit être en mesure d'atteindre 600 Km/h et de déverser une charge de 4 tonnes de bombes sur l'Angleterre en partant des bases situées en France ou en Norvège. De plus le cockpit de l'appareil doit être pressurisé pour des vols à très haute altitude et doté d'armements défensifs télécommandés.

Le FW191 est un bombardier à aile haute de construction métallique, équipé de deux moteurs 24 cylindres Jumo 222 (plus prometteur que les moteurs DB 604, pressentie au début de l'étude) montés dans des nacelles dans les ailes. L'équipage prévu se compose de 4 personnes dans un cockpit pressurisé surmonté d'un grand dôme en plexiglas utilisé par le navigateur et l'opérateur radio pour la viser aux canons télécommandés. L'armement opérationnel proposé se compose, d'un canon 20 mm MG 151 dans une tourelle de menton, deux canons jumelés de 20 mm MG 151 dans une tourelle dorsale contrôlé à distance, d'un canon double de 20 mm MG 151 dans une tourelle ventrale, une tourelle de queue avec une ou deux mitrailleuses et d'armes télécommandées à l'arrière des nacelles des moteurs. Cependant, différentes combinaisons ont été montées dans les différents prototypes.

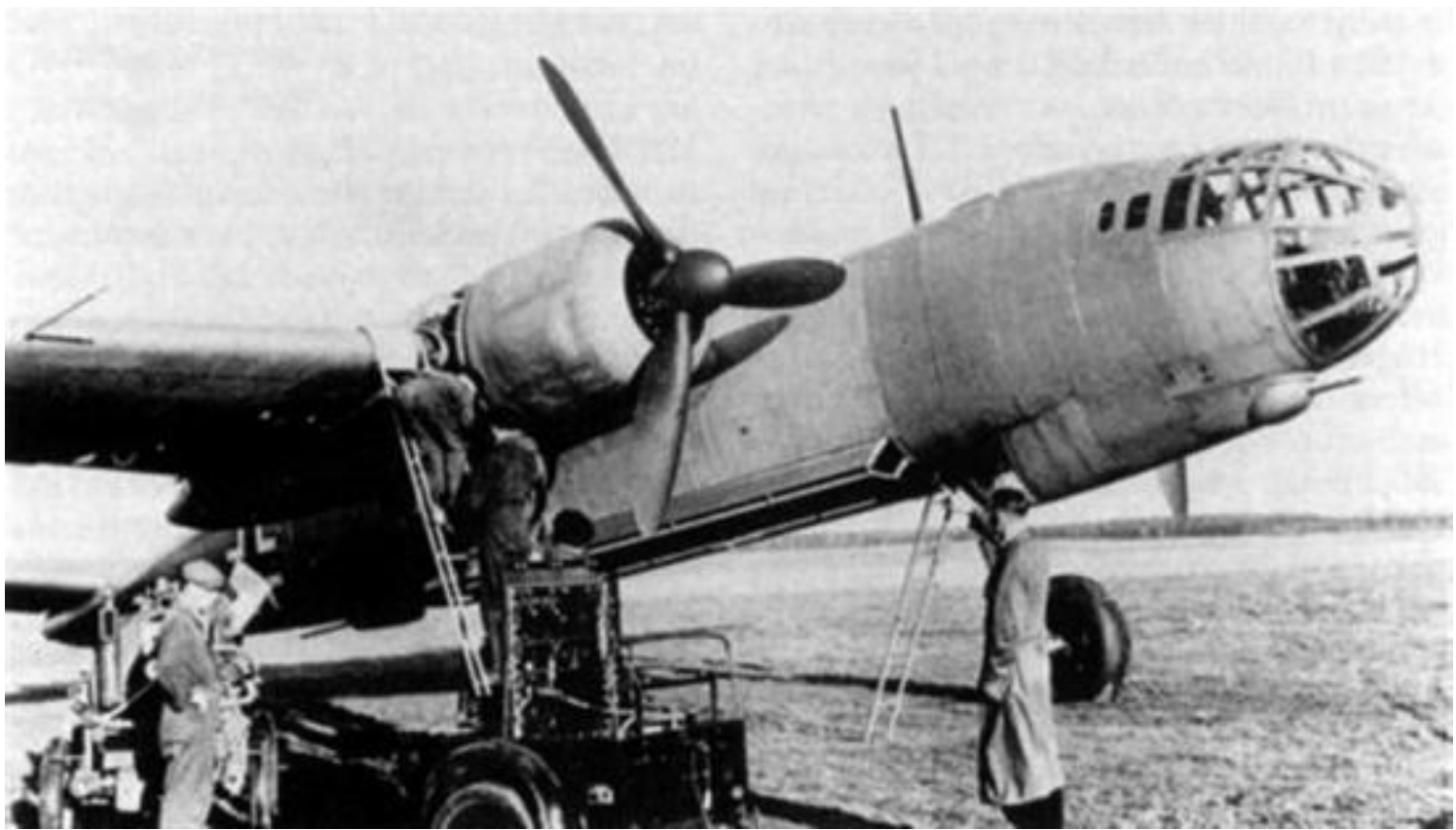
L'avion a une soute à bombes interne et des bombes ou torpilles peuvent être emportés sur des supports externes entre le fuselage et les nacelles moteurs. L'installation de moteurs électriques et de câblage très conséquent a conduit certains à surnommé l'appareil de "Das fliegende Kraftwerk" (la centrale volante). Cela a également eu pour effet néfaste d'ajouter encore plus de poids à la cellule déjà surchargée, et aussi le danger qu'une balle ennemie mette hors d'état l'ensemble si un générateur été touché.

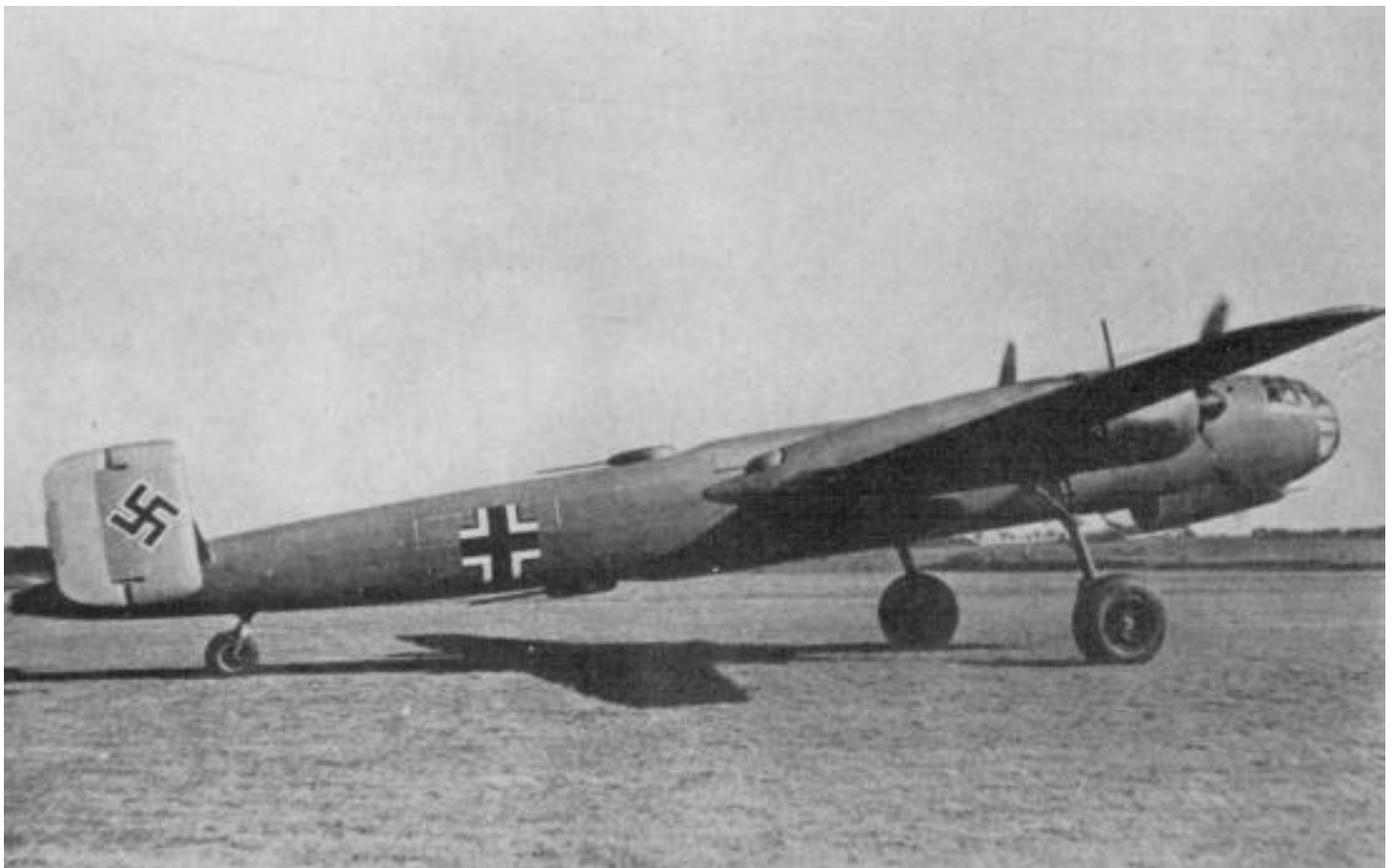
Au début de l'année 1942, le FW191 V1, effectue son premier vol et le constat est accablant : Les moteurs sont sous dimensionnés. Les moteurs Jumo 222 n'étant pas opérationnels le V1 utilise deux BMW 801a radiaux de 1560 Chevaux, et ce premier vol fut effectué avec des armes factices et sans charges offensives !! Après dix vols d'essais, un deuxième prototype est construit. Le projet est paralysé par des problèmes de moteur et une utilisation intensive d'équipements électriques des systèmes motorisés, en lieu et place des classiques commandes hydrauliques. Après trois autres prototypes, le RLM accepte l'abandon des commandes électrique sur le FW191 V6 enfin équipé d'une paire de Jumo 222 de 2170 chevaux spécialement préparés. Le premier vol du nouveau FW 191 a lieu en Décembre 1942 avec le Flugkapitän Hans Sander aux commandes. Bien que le V6 vole mieux, les Jumo 222 ne développent toujours pas leurs pleines puissances.

Plusieurs autres tentatives furent tentées, avec d'autres moteurs, en supprimant les tourelles télécommandés ou la pressurisation du cockpit, mais toujours sans succès. Le RLM annula par la suite le programme « Bomber B » en raison d'un manque de moteurs suffisamment puissant et d'une pénurie de métaux stratégiques. Seul trois FW191 furent construits.

Focke-Wulf Fw191 :

- 2 Moteurs Junkers Jumo 222
- 2 X 2170 Ch
- 620 Km/h
- 4 Canons 20 mm 2 Mitrailleuses 7.92 mm 4200 Kg de bombes
- 19575 Kg en charge
- 9700 m de plafond pratique
- 3700 Km en distance franchissable
- 4 Equipiers





<http://les-avions-de-legende.e-monsite.com/pages/les-prototypes/les-prototypes-allemands/focke-wulf-fw-191.html>

version anglaise

The **Focke-Wulf Fw 191** was a [prototype German bomber](#) of [World War II](#), as the [Focke-Wulf](#) firm's entry for the [Bomber B](#) advanced medium bomber design competition. Two versions were intended to be produced, a twin-engine version using the [Junkers Jumo 222](#) engine and a four-engine variant which was to have used the smaller [Daimler-Benz DB 605](#) engine. The project was eventually abandoned due to technical difficulties with the engines.

Design and development

In July [1939](#), the RLM issued a specification for a high-performance [medium bomber](#) (the "[Bomber B](#)" program). It was to have a maximum speed of 600 km/h (370 mph) and be able to carry a bomb load of 4,000 kg (8,820 lb) to any part of Britain from bases in France or Norway. Furthermore, the new bomber was to have a [pressurized](#) crew compartment, of the then-generalized "stepless cockpit" design (with no separate windscreen for the pilot) pioneered by the [He 111P](#) shortly before the war and used on most German bombers during the war, remotely controlled armament, and was to utilize two of the new 2,500 PS (2,466 hp, 1,839 kW) class of engines then being developed (Jumo 222 or [Daimler-Benz DB 604](#)), with the Jumo 222 being specified for the great majority of such twin-engined designs, that Arado, Dornier, Focke-Wulf and Junkers had created airframe designs to use. The [Arado Ar E340](#) was eliminated. The [Dornier Do 317](#) was put on a low-priority development contract; and the [Junkers Ju 288](#) and [Focke-Wulf Fw 191](#) were chosen for full development.

Dipl. Ing E. Kösel, who also worked on the [Fw 189 reconnaissance](#) plane, was supposed to have led the design team for the Fw 191. Overall, the Fw 191 was a clean, all-metal aircraft that featured a shoulder-mounted wing. Two 24-cylinder Jumo 222 engines (which showed more promise than the DB 604 engines) were mounted in nacelles on the wings. An interesting feature was the inclusion of the Multhopp-Klappe, an ingenious form of combined landing [flap](#) and [dive brake](#), which was developed by [Hans Multhopp](#). The entire fuel supply was carried in five tanks located above the internal [bomb bay](#), and in two tanks in the wing between the engine nacelles and [fuselage](#).

The tail section was of a twin [fins](#) and [rudders](#) design, with the [tailplane](#) having a small amount of [dihedral](#). The main [landing gear](#) legs retracted to the rear and rotated 90° to lie flat in each engine nacelle with the mainwheels resting atop the lower ends of the gear struts when fully retracted, much like the main gear on the production versions of the [Ju 88](#) already did. Also, the tailwheel retracted forwards into the fuselage. A crew of four sat in the pressurized [cockpit](#), and a large Plexiglas dome was provided for the navigator; the radio operator could also use this dome to aim the remotely controlled rear guns.

The Fw 191 followed established Luftwaffe practice in concentrating the crew in the nose compartment, also including the nearly ubiquitous *Bola*, inverted-[casemate](#) undernose gondola for defensive weapons mounts first used on the Ju 88A before the war, and in the use of a "stepless cockpit", having no separate windscreen for the pilot, as the later -P and -H versions of the [Heinkel He 111](#) already did. This was pressurised for high-altitude operations. The proposed operational armament consisted of one 20 mm [MG 151 cannon](#) in a chin [turret](#), twin 20 mm MG 151 in a remotely controlled dorsal turret, twin 20 mm MG 151 in a remotely controlled ventral turret, a tail turret with one or two [machine guns](#) and remotely controlled weapons in the rear of the engine nacelles. However, different combinations were mounted in the prototype aircraft. Sighting stations were provided above the crew compartment, as well as at the ends of the aforementioned *Bola* beneath the nose.

The aircraft had an internal bomb bay. In addition, bombs or [torpedoes](#) could be carried on external racks between the fuselage and the engine nacelles. The design was to have had a maximum speed of 600 km/h (370 mph), a bomb load of 4,000 kg (8,820 lb), and a range allowing it to bomb any target in [Britain](#) from bases in [France](#) and [Norway](#).

Failure and end of program

It is said that the intention to use electric power for almost all of the aircraft's auxiliary systems (also a fact for the successful Fw 190 fighter), requiring the installation of a large number of electric motors and wiring led to the nickname for the Fw 191 of "*Das fliegende Kraftwerk*" (the flying powerstation). This also had the detrimental effect of adding even more weight to the overburdened airframe, plus there was also the danger of a single enemy bullet putting every system out of action if the generator was hit. Dipl. Ing Melhorn took the Fw 191 V1 on its maiden flight early in 1942, with immediate problems arising from the lower rated engines not providing enough power, as was anticipated. One surprising problem that was encountered were the Multhopp-Klappe, which presented severe flutter problems when extended, and pointed to the need for a redesign. At this point, only dummy gun installations were fitted and no bomb load was carried. After completing ten test flights, the Fw 191 V1 was joined by the similar V2, but only a total of ten hours of test flight time was logged. The 2,500 PS (2,466 hp, 1,839 kW) [Junkers Jumo 222](#) engines which would have powered the Fw 191 proved troublesome. In total only three prototype aircraft, V1, V2 and V6, were built. The project was crippled by engine problems and an extensive use of electrical motor-driven systems. Problems arose almost immediately when the Jumo 222 engines were not ready in time for the first flight tests, so a pair of 1,560 PS (1,539 hp, 1,147 kW) BMW 801A [radial engines](#) were fitted. This made the Fw 191 V1 seriously underpowered. Another problem arose with the RLM's insistence that all systems that would normally be hydraulic or mechanically activated should be operated by electric motors.

At this point, the RLM allowed the redesign and removal of the electric motors (to be replaced by the standard hydraulics), so the Fw 191 V3, V4 and V5 were abandoned. The Fw 191 V6 was then modified to the new design, and also a pair of specially prepared Jumo 222 engines were fitted that developed 2,200 PS (2,170 hp, 1,618 kW) for takeoff. The first flight of the new Fw 191 took place in December 1942 with *Flugkapitän* Hans Sander at the controls. Although the V6 flew better, the Jumo 222 were still not producing their design power, and the whole Jumo 222 development prospect was considered dubious due to the shortage of special metals for it. The Fw 191 V6 was to have been the production prototype for the Fw 191A series.

Due to the German aviation engine industry having [chronic problems](#) in producing engines capable of [equal to or more than the 1,500 kW \(2,000 PS\) figure](#) during the war, that were fit for service, the Jumo 222 engines were having a lot of teething problems and the Daimler Benz DB 604 had already been abandoned, a new proposal was put forth for the Fw 191B series. The V7 through V12 machines were abandoned in favor of using the Fw 191 V13 to install a pair of Daimler Benz DB 606 or 610 "power system" engines, which were basically coupled pairs of either DB 601 or 605 12-cylinder engines. Their lower [power-to-weight ratio](#) from their 1.5 tonne weight for each "power system", meant that the armament and payload would have to be reduced. It had already been decided to delete the engine nacelle gun turrets, and to make the rest manually operated. Five more prototypes were planned with the new engine arrangement, V14 through V18, but none were ever built, possibly from the August 1942 condemnation by *Reichsmarschall* [Hermann Göring](#) of the coupled "power system" DB 606 and 610 powerplants as ["welded-together engines"](#), in regards to their being the primary cause of the unending series of powerplant problems in their primary use, as the engines on Heinkel's [He 177A Greif](#), Germany's only production heavy bomber of World War II.

One final attempt was made to save the Fw 191 program, this time the Fw 191C was proposed as a four engined aircraft, using either the 1,340 PS (1,322 hp, 986 kW) Jumo 211F, the 1,350 PS (1,332 hp, 993 kW) DB 601E, the 1,475 PS (1,455 hp, 1,085 kW) DB 605A or similar rated DB 628 engines. Also, the cabin would be unpressurized and the guns manually operated, with a rear step in the bottom of the deepened fuselage — in the manner of the near-ubiquitous [Bola gondola](#) used by the majority of German bombers for ventral defense under the nose — being provided for the gunner. Focke-Wulf used the designations **Fw 391** and **Fw 491** for the different variants of the Fw 191C, but these were unofficial and never allocated by the RLM.

The "[Bomber B](#)" program had been canceled, due mainly to no engines of the 2,500 PS class being available, which was one of the primary requirements in the "Bomber B" program. Although the Fw 191 will be remembered as a failure, the airframe and design eventually proved themselves to be sound; only the underpowered engines and insistence on electric motors to operate all the systems doomed the aircraft. There were only three Fw 191s built (V1, V2 and V6), and no examples of the Fw 191B or C ever advanced past the design stage. The RLM kept in reserve for Focke-Wulf the future number: [Fw 391](#) for follow-up designs but nothing came of it and the project was eventually scrapped.

Specifications (Fw 191B - DB 610 engines)

Data from Aircraft of the Third Reich : Volume one.

General characteristics

- Crew: 5
 - Length: 19.63 m (64 ft 5 in)
 - Wingspan: 26 m (85 ft 4 in)
 - Height: 5.6 m (18 ft 4 in)
 - Wing area: 70.5 m² (759 sq ft)
 - Gross weight: 25,490 kg (56,196 lb)
- 23,585 kg (51,996 lb) DB 606 engines
- Max takeoff weight: 25,319 kg (55,819 lb)
- 24,995 kg (55,105 lb) DB 606 engines
- Fuel capacity: 3,930 L (1,040 US gal; 860 imp gal) normal ; 7,570 L (2,000 US gal; 1,670 imp gal) with ferry tanks
 - Powerplant: 1 × [Daimler-Benz DB 610A](#) 24-cylinder liquid-cooled coupled V-12 piston engine, 2,140 kW (2,870 hp) for take-off at 2,800 rpm at sea level
- 1,909 kW (2,560 hp) at 2,300 rpm at 7,620 m (25,000 ft)
- gear ratio 0.413:1 LH propeller rotation
- Powerplant: 1 × [Daimler-Benz DB 610B](#) 24-cylinder liquid-cooled coupled V-12 piston engine, 2,140 kW (2,870 hp) for take-off at 2800 rpm at sea level in cruise
- 1,909 kW (2,560 hp) at 2300 rpm at 7,620 m (25,000 ft)
- gear ratio 0.413:1 RH propeller rotation
- Propellers: 4-bladed VDM constant-speed propeller, 4.52 m (14 ft 10 in) diameter LH and RH rotation

Performance

- Maximum speed: 565 km/h (351 mph, 305 kn) at 3,950 m (12,959 ft)
- 632 km/h (393 mph; 341 kn) at 9,450 m (31,004 ft)
- Cruise speed: 500 km/h (310 mph, 270 kn)
 - Range: 1,800 km (1,100 mi, 970 nmi) at 500 km/h (310 mph; 270 kn)
 - Ferry range: 3,860 km (2,400 mi, 2,080 nmi) at 490 km/h (300 mph; 260 kn)
 - Service ceiling: 8,780 m (28,810 ft) at 23,135 kg (51,004 lb)
 - Rate of climb: 7.67 m/s (1,510 ft/min) at 23,860 kg (52,602 lb)

Armament

- 2 × [7.92 mm](#) (.312 in) [MG 81 machine guns](#) in chin turret
- 2 × 7.92 mm (.312 in) MG 81 machine guns in remote-controlled turret at rear of each engine nacelle
- 1 × [20 mm MG 151/20 cannon](#) and 2 × [13 mm](#) (.51 in) [MG 131 machine guns](#) in dorsal turret
- 1 × 20 mm MG 151/20 cannon and 2 × 13 mm (.51 in) MG 131 machine guns in ventral turret
- 4,200 kg (9,240 lb) of bombs (Two torpedoes could also be carried internally)

Source : https://en.wikipedia.org/wiki/Focke-Wulf_Fw_191