

THE MARKS OF Bf 109

IN ALPHABETIC AND NUMERICAL ORDER.

[Early Prototypes \(V\)](#) | [Post War Developments](#) | [Related Projects](#)

A - Intended first production version of the 109, was to have had only two machine-guns for armament. Never produced.

B-0 - Jumo 210B engine (610hp) and an armament of three machine guns, two above the engine and one firing through the airscrew.

B-1 - Jumo 210D (635hp).



B-2 - Jumo 210E (640 hp) or Jumo 210G (670 hp) many of the earlier B aircraft were modified to B-2 standard with the more powerful engine.

C-0 - Jumo 210G engine and four machine guns, two above the engine and two in the wings. A pre-production version. The C series introduced a larger fuel tank to give increased range.

C-1 - Full production version of the C-0.

C-2 - Armament increased to five machine-guns with fifth gun firing through airscrew spinner.

D-0 - Daimler-Benz DB600A engine (960hp). Single 20mm cannon firing through airscrew and two machine guns. A pre-production version. The DB600A engine needed radiators beneath the wings and an air scoop on the port side of the nose.

D-1* - Full production version of the D-0. Probably mounted four machine-guns.

D-2* - Extra armament of engine mounted 20mm cannon. Trials only, never entered production.

D-3* - Wing machine guns replaced by MGFF 20mm cannon. Never entered production.

**Research has indicated that shortages of DB600A engines meant most of the "D" series were in fact engined with the Jumo 210Da engine (640 hp) and looked virtually identical to the B and C series. The normal armament of the production D series was four machine guns, two in the fuselage and one*

in each wing.

E-0 - Pre-production, DB 601 engine (1,150 hp). Armament of four machine guns, two on top of engine, two in wings. Angular air intake on the port side of the engine.

E-1 - Full production version of E-0, wing machine guns could be replaced by MG FF cannon in the field. DB601 A engine as standard.

E-1/B - As E-0 but with provision to carry a bomb beneath the fuselage.

E-2 - Delivered with MGFF cannon in wings as standard.

E-3 - Delivered with 20mm Cannon firing through airscrew and four machine guns, two on top of engine and two in the wings. The engine cannon was often removed in service, and the two wing machine guns replaced by cannon.

E-4 - Engine mounted cannon deleted.



Bf109 E

E-4/B - Bomber version of the E-4 with provision for a single bomb under the fuselage.

E-4/N - Fitted with the DB601N engine (1,200 hp), giving increased performance and nitrous oxide boost.

E-4/Trop - Tropical version with large sand filter on super-charger air intake and a special survival pack in the fuselage. Used in North Africa.

E-5 - Reconnaissance fighter with cameras and armament reduced to only two fuselage machine guns. DB 601A engine used (1,150 hp).

E-6 - Same as the E-5 except that the DB601N engine (1,200 hp and nitrous oxide boost) was used.

E-7 - DB601N engine, two machine guns over engine, either two machine guns or cannon in wings. Ability to carry a long-range fuel tank beneath the fuselage.

E-7/U2 - As the E-7 but the fuel tank could be replaced by a bomb. Extra armour around the pilot for protection in the ground attack role.

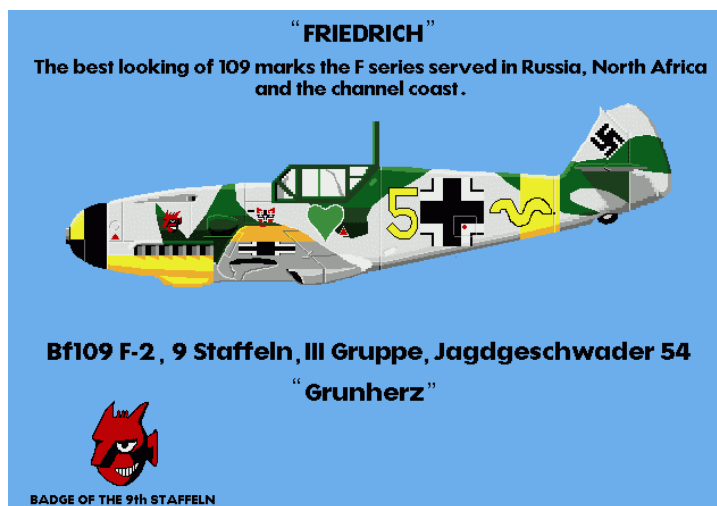
E-7/Z - Nitrous oxide injection to improve altitude performance.

E-8 - DB601E engine (1,200 hp).

E-9 - Reconnaissance aircraft with only two machine guns and camera equipment.

F-0 - Modified E airframes with DB 601N engine. The new F series featured larger spinner, retracting tailwheel, no bracing for the tailplane, no wing armament, extended and rounded wingtips. Pre-production aircraft.

F-1 - Full production version, armament of two MG 17 machine guns and 20mm MG FF hub cannon.



F-2 - Hub cannon replaced by the MG 151 cannon of 15 mm calibre with a higher rate of fire and increased velocity. Tropical versions produced.

F-2/Z GM-1 - nitrous oxide boost fitted.

F-3 - DB 601E engine fitted (1,300 hp).

F-4 - The MG 151 hub cannon is rebarrelled to 20mm calibre but retains its better ballistics. It could also carry the R1 field conversion kit of two additional cannon beneath the wings. Tropicalized versions were also produced.

F-4/B - Fighter bomber version capable of carrying up to 1,102 lbs bombload.

F-5 - Reconnaissance fighter version with only two fuselage machine guns for armament.

F-6 - As the F-5 except for the camera equipment fitted. Production of the F-6 and F-5 continued after the G series had started into service to continue to provide the equipment for the Luftwaffe's reconnaissance units.

G-0 - Designed to take the more powerful DB605 engine the G-0 pre-production aircraft had to make do with the DB601E engine.

G-1 - DB605A engine (1,475 hp) with GM-1 nitrous oxide power boost and cabin pressurisation.

Armament of one MG 151 20 mm cannon and two 7.9 mm MG 17 machine guns.

G-1/Trop - Tropicalised version of the G-1, this was the first mark to replace the two nose guns with ones of 13mm calibre (MG 131s), these had two bulges over their breech blocks.

G-2 - Cabin pressurisation equipment removed, armed with the original 7.9 mm machine guns. Often employed in the low level reconnaissance role.

G-2/R1 - Fighter bomber version able to carry a fuel tank under each wing and an SC 500 bomb under the fuselage, the ground clearance needed being provided by a jettisonable wheel mounted beneath the rear fuselage.

G-3 - Identical with the G-1 except for the radio fit carried.

G-4 - Unpressurised version of the G-3

G-5 - Armament of two 13mm machine guns and one 20 mm cannon. DB605D engine fitted with MW 50 water and methanol injection to boost power to 1,800 hp for short periods. The water and methanol were carried in a tank below the fuselage.

G-5/R2 - A new higher fin was introduced to counter engine swing on take-off and landing, this was made of wood. A stronger tailwheel was also fitted.

G-6 - Most numerous of 109 marks the G-6 appeared with various models of the DB605 engine. Armament was two 13mm machine guns and a 30mm MK-108 cannon. Various field and factory modifications could be fitted. Metal tail fitted.



Bf109 G-6

G-6/R1 - Bomber version able to carry a bombload of 1,100 lb.

G-6/R2 - Two WGr 210 21cm tube launched rockets carried, one under each wing.

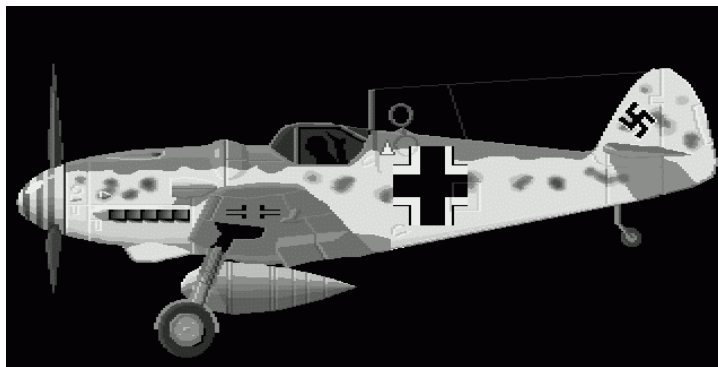
G-6/R6 - Two 20mm MG 151 cannon carried in "gondolas", one under each wing.

G-6 - U4 Two 30mm MK 108 cannon carried beneath the wings.

G-6 U4N - Night fighter with Naxos Z homing receiver.

G-8 - Reconnaissance fighter with only two machine guns. Used the metal tail assembly.

G-10 -DB 605D engine with MW-50 engine boost. Armament of one 30mm cannon and two 13 mm machine guns.



Bf109 G10 - Fastest of the G series

G-10/U4 - Armament increased with a belly pack containing two 30mm MK 108 cannon. This could be exchanged for a fixed belly fuel tank.

G-10/R2 - Used same wooden tail unit as the G-5. Also fitted with the improved cockpit canopy sometimes known as the "Galland Hood" after Adolf Galland, the German Ace and General of Fighters, but more correctly called the "Erla" cockpit (after the factory that introduced it).

G-10/R6 - New IFF equipment fit.

G-12 - Two seat trainer developed from the G-1.

G-14 - The G-14 carried the smaller calibre 20 mm MG 151 hub cannon together with the two 13mm machine guns. It could be fitted easily with either underwing cannon or rockets and could carry a bomb. Cockpit canopy of the "Galland Hood" type. At least one G-14 was modified to carry a 20mm cannon in the rear fuselage firing upwards in a "Schrage Musik" installation meant for night attacks on British bombers, firing upwards into their bellies.

G-16 - Ground attack aircraft with extra armour protection, it did not reach operational service.

H-0 - Pre-production version modified from F series airframes. The H series was an attempt to produce a high altitude fighter. Wing span was increased by 6ft 6ins by adding a section to the wing root. The tailplane was increased in span and had to be braced to the fuselage. DB 601 engine used.

H-1 - Production version with DB605 engine with the GM 1 power boost system. Armament was one cannon and two machine guns, although it was hoped to fit an additional two machine guns in the wings. Only a small number were produced, the Luftwaffe favouring the Focke-Wulf Ta 152H design.

H-2 - Proposed high altitude fighter with a Jumo 213E engine (1,750 hp) and armament of three MK 108 30 mm cannon and two MG 151 15mm cannon, the later mounted on top of the engine in place of the machine guns. Never produced.

H-5 - Another proposed high altitude fighter, this time using the DB605L engine (1,700 hp), which had a two stage mechanical supercharger. Never produced.

J - Designation reserved for aircraft to be produced in Spain.

K-0 - The K series was very similar to the earlier G series, with only minor structural changes. The K-0 models were pre-production versions modified from G series airframes. The DB 605D engine was fitted. All the K series used the Erla cockpit canopy.

K-2 - First production version of the K series. Armament was an MK108 30mm hub cannon and two 15mm MG151 cannon on top of the engine. Engines used were the DB605ASCM and DB605ADCM.

K-4 - Same as the K-2 but with cabin pressurisation.

K-6 - Armament increased, hub cannon was MK 108 30mm and two additional MK 108 cannon were carried beneath the wings. Over the engine armament reverted to two 13mm machine guns.



Bf109K - last type to see combat

K-14 - Last production version Bf109 to enter service, the K-14 was powered by the two stage DB605L (1,700 hp) and carried an armament of a single 30mm hub cannon and two 13 mm machine guns.

L - Projected fighter using the Jumo 213E engine with a redesigned, broader, fuselage and modified wing. Never produced.

R - Fictitious designation of the Me 209 world speed record holder to make it appear that the Luftwaffe had fighter aircraft capable of 469 mph.

S - To improve handling at low speed for take-off and landing it was proposed to feed air from an intake under the fuselage to outlets at the flaps and ailerons, a system known as "blown flaps". Also did away with the wing radiators by using an evaporating cooling system. The S series was to have used these systems and work on the prototype (V24) was well advanced when the factory involved (in occupied France) was captured.

T-0 - The T series was to have been Germany's aircraft carrier fighter. (T stood for Traeger, German for carrier) with increased wingspan. The T-0 designation never actually officially existed but the designation is usually associated with the various prototypes used to develop the extended wing (modified B, C and E airframes). The extended wingspan allowed the resulting T series to take off and land in shorter distances.

T-1 - Full production version based on the E series, built from the outset as carrier aircraft by the firm of Feiseler, the T-1 featured catapult spools and arrestor hooks.. The undercarriage was also strengthened to withstand carrier landings. The wings did not fold but like all marks of Bf109 they could be easily removed altogether while the fuselage was still supported on the wheels. Only 7 were completed before the German aircraft carrier *Graf Zeppelin* project was cancelled.

T-2 - When the Graf Zeppelin was cancelled the rest of the production batch aircraft were completed without carrier equipment (catapult spools and arrestor hooks) but retained the extended wingspan. They were used from short landing grounds in Norway and the island of Dune near the German fortress island of Heligoland.

TL - Part of a large series of projects to combine the easily produced Bf109 with the new jet engine technology, the TL design featured a 109 fuselage with new wings mounting jet engines beneath them. Never built.

V - Designation given to all prototypes in the 109 series. Each of the major series would be preceded by one or more prototypes that would have tested out the technical and structural advances. These prototypes would usually be all-new aircraft. Then pre-production airframes would have been built usually using airframes of the earlier models as a starting point (i.e. E-0, F-0 and G-0). This would ensure the smooth introduction of each new series into production. The Germans were notable in producing many more prototype and test aircraft than was the practice in the allied powers. [See the section on early109 prototypes below.](#)

X - Designation given to a single prototype of the Bf109 fitted with the BMW801 radial engine (as used on FW190).

Z - The Zwilling (twin) project was another attempt to make use of the easily produced 109 by combining two 109 fuselages and outer wings with a new wing section and tailplane joining the two halves together. This may seem strange but the American post-war F-82, which combined two Mustang fighter airframes in the same way, was outstandingly successful. The Zwilling would have been used as a heavy bomber destroyer or fast bomber. Only one pilot was needed, one of the cockpits being deleted.

Z-1 - Original design based on mating two 109F airframes. Armament of five 30mm cannon and 1,100 lbs of bombs. None produced.

Z-2 - Projected bomber version with only two 30mm cannon and a bombload of 4,400 lbs. None produced.

Z-3 - Same as the Z-1 but with Jumo 213 engines. One prototype was built, but it never flew.

Z-4 - Same as the Z-2 bomber but with Jumo 213 engines. Never produced.

POST-WAR DEVELOPMENT

CZECHOSLOVAKIA

Avia S99 - Essentially Bf109 G-14 complete with DB605 engine

Avia S199 - Single seat fighter based on the Bf109 G-14 but with a Jumo 211 engine, this was an in-line engine, but its annular radiator made it look like a radial.

Avia CS199 - Two seat trainer development of the S199.



Avia S-199

SPAIN

Hispano powered:-

HA 1109 J1L - Initial Spanish production batch of 25 aircraft with Hispano HS 12Z-89 engine, based on the Bf109G-2.

HA 1109 K1L - Major production batch fitted with Hispano 12Z-17 engine (1,300 hp). Initially no armament was fitted.

HA 1110 K1L - Two seat tandem trainer version with the 12Z-17 engine.

HA 1112 K1L - When fitted with armament, the earlier 1109 became the 1112. Armament of two 20mm Hispano HS 404 cannon was fitted inside the wing, the first 109 type to do so since the 109E. For ground attack a total of eight 22lb rockets could be carried.

Rolls-Royce Merlin powered:-

HA 1112 M1L - Identical with the 1112 K1L except fitted with a Merlin 500-45 engine of 1,400hp driving a four bladed propeller. All the 1112 K1L aircraft were upgraded to the M1L standard.

HA 1109 M2L - This variant carried two 12.7 mm CETMA machine guns in place of the cannon. Oerlikon rockets could still be carried. Powered by a Merlin.

HA 1109 M3L - This model deleted the gun armament altogether and only carried the eight ground attack rockets. Merlin powered.

HA 1112 M4L - Merlin engined tandem two-seat training aircraft.



The "Buchon" Spanish produced version of the 109, powered by a British Merlin engine. Note the chin radiator.

EARLY 109 PROTOTYPES (V)

V1 -Original 109 prototype fitted with Rolls-Royce Kestrel engine of 695 hp. Civil registration D-IABI.



First of the Breed - The V1 Prototype

V2 -Second prototype. It was powered by the Jumo 210A engine specified by the Luftwaffe. Some areas of the airframe were strengthened. Civil registration D-IUDE.

V3 -Two machine guns fitted above the engine, synchronized to fire through the propeller. Civil registration D-IHNY. Undertook service tests in Spain during 1936/37.

V4 -Third machine gun added, mounted to fire through propeller hub. Civil registration D-IOQY. Prototype for the B series, the V4 was sent to Spain for service tests in 1936/37. It also undertook tests with a 20mm cannon in place of the third machine gun.

V5 -Armament of three machine guns, Jumo 210B engine. Completed service trials in Spain 1936/37.

V6 -Three machine guns, Jumo 210B engine.

V7 -Three machine guns, Jumo 210B engine. Almost identical with production B series fighters.

V8 -Improved Jumo 210D engine (635 hp). Armament of four machine guns, two above engine, one in each wing.

V9 -Jumo 210D engine. Armament of two nose machine-guns and an MGFF cannon in each wing root.

V10 -No armament, fitted with Jumo 210G engine (640 hp). It would seem another aircraft was also designated as a V10, this was a production 109B modified to take the DB600 engine (960 hp). The latter aircraft was flown by Udet in the 1937 "Around the Alps" race, during which it lost power and crashed.

V11 -No armament, longer fuselage to take the DB600 engine.

V12 -Armament of two machine guns and one cannon. DB600 engine. Prototype for the D series.

V13 -The V13 appeared in two different guises, firstly powered by the DB600, it took part in the July 1937 Zurich air races, secondly, with a DB601 specially modified to produce 1,650 hp it claimed the world landplane speed record in November 1937.

V14 -DB601 powered aircraft with armament of two machine guns and two wing cannon. This, together with the V15 was the prototype for the E series.

V15 -DB601 engine, two machine guns and one hub cannon.

V21 -Prototype for a proposed export version of the Bf109 with an American Pratt and Whitney R-1830 Twin Wasp radial engine. It featured a wider fuselage and a cut-down rear fuselage with a teardrop canopy.

OTHER RELATED PROJECTS

BFW M-29, M-31, M-35 - A series of two-seat sports aircraft, all with low monoplane wing and fixed undercarriage. They show the evolution of the streamlined form that would lead to the Bf109.

Bf 108 (BFW M-37) -The forerunner of the Bf109, the 108 was a very advanced touring aircraft. Its wings were almost the same as the early 109 fighter's and it was an ideal two-seat trainer for the pilots of the Messerschmitt fighter. Production was continued in France after the war and its performance would shame many a small civil aircraft of today.



The dainty but tough Taifun tourer, used as a trainer and communications aircraft by the Luftwaffe.

Me 155 -A Messerschmitt design for a completely new aircraft carrier fighter, the original Me 155 design had the nose contours and cockpit lines of the Bf109. The design was later developed into a high altitude fighter with a huge wingspan. Responsibility for the project was handed over to Blohm and Voss who changed the design somewhat and produced two examples, only one of which flew,

but crashed. The Me 155 design was also involved in the planning of the Bf109TL project; it was hoped to use parts of the Me 155 in the TL to speed up production.

Me 209 - High Speed design meant to produce the next generation of fighter aircraft for Germany after the Bf109. One of the prototypes gained the world speed record for Germany in 1939. When developed for combat use it showed no significant advantage over the 109. Tested against the Focke-Wulf 190 and the Heinkel 100 (He 113), the Luftwaffe chose the Focke-Wulf as the successor to the Bf109. (See also Bf109R.)

The Me 209 designation was also used for an entirely different aircraft, The Me 209-11 or V5 was based on the 109G aircraft. However the new design could well have been a "cover" to get a new improved fighter design past officials in the German Air Ministry who wanted production concentrated on existing proven types. With a wide, inward-retracting undercarriage and a DB603G engine of 1,900 horsepower the aircraft should have been a winner. Delays in production of the DB603G engine meant the aircraft had to be redesigned around a Jumo 213 engine. Prototypes were flown and all was set for production to start as the Me209A-2 when the project was ordered halted.

Me 262 - Messerschmitt's twin jet engined fighter was years ahead of its time and was superior to any allied fighter. Had it been available earlier and in greater numbers it could have kept air supremacy for the Germans. At the same time the obvious promise of its performance stopped development of more advanced piston engined types by the German aircraft industry.

Me 309 - An attempt to design a new fighter, the Me 309 project got as far as producing four prototypes, but the aircraft ran into many design difficulties and disasters. The initial tricycle undercarriage gave problems and the first prototype was damaged many times during take-off or landing. Five different tail designs were tried without success. In the end the project was cancelled and the existing prototypes used for testing of parts for the Me262.

Me 409 - A design for a larger version of the Me309. Abandoned with the Me309.

Me 609 - A development of the Bf109Z Zwilling aircraft. It never got beyond the design stage.

[Return to Bf109
homepage](#)