Messerschmitt Me 410 Hornisse: Le véritable remplacant du Bf110

Le **Messerschmitt Me 410 Hornisse** (*frelon*) était un chasseur lourd et un Schnellbomber **(en)** allemand de la Seconde Guerre mondiale développé à partir du désastreux Messerschmitt Me 210. Bien qu'il soit un dérivé issu directement du 210, celui-ci avait gagné une si mauvaise réputation, qu'on décida de changer le nom de l'avion.

Développement

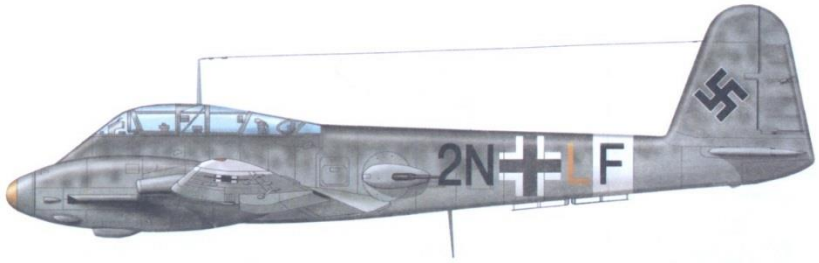
Depuis 1939, la Luftwaffe avait prévu d'adopter le Me 210, successeur du célèbre mais vulnérable Bf 110, mais ce dernier se montrait si instable, qu'il n'était jamais rentré en production. Néanmoins, les Hongrois, avaient réalisé une série de modifications mineures sur la configuration de l'avion, pour produire le Me 210C, qui le rendait supérieur aux modèles allemands. Le résultat était tel que des pourparlers furent engagés pour produire l'avion en Allemagne, sous la désignation de Me-210D, mais au fur et à mesure que les études avançaient, on décida d'introduire plutôt un nouveau modèle, le Me 410.

La principale évolution était l'adoption de moteurs DB-603, d'une cylindrée supérieure au DB-605, et capable de fournir 1 750 chevaux, au lieu de 1 500. La puissance supplémentaire, permit d'améliorer à la fois, la vitesse de pointe qui passa à 625 km/h, celle de croisière qui atteignit 579 km/h, mais aussi le plafond et le taux de montée. Les innovations testées sur le Me 210, qui avaient démontré qu'elles amélioraient le comportement de l'avion, furent retenues sur le Me 410, le fuselage était ainsi rallongé et les bords d'attaque des ailes pourvus de fentes. On ajouta aussi des points d'emport pour quatre bombes de 50 kg, pour exploiter l'accroissement de la masse maximale au décollage. Au total, ces modifications augmentaient la masse à vide de 680 kg, mais le surcroît de puissance des nouveaux moteurs compensait largement cette différence. Le Me 410, fut en quelque sorte l'avion que le Me 210 aurait dû être, les premières livraisons commencèrent à la mi-1943, plus de deux ans plus tard que prévu.

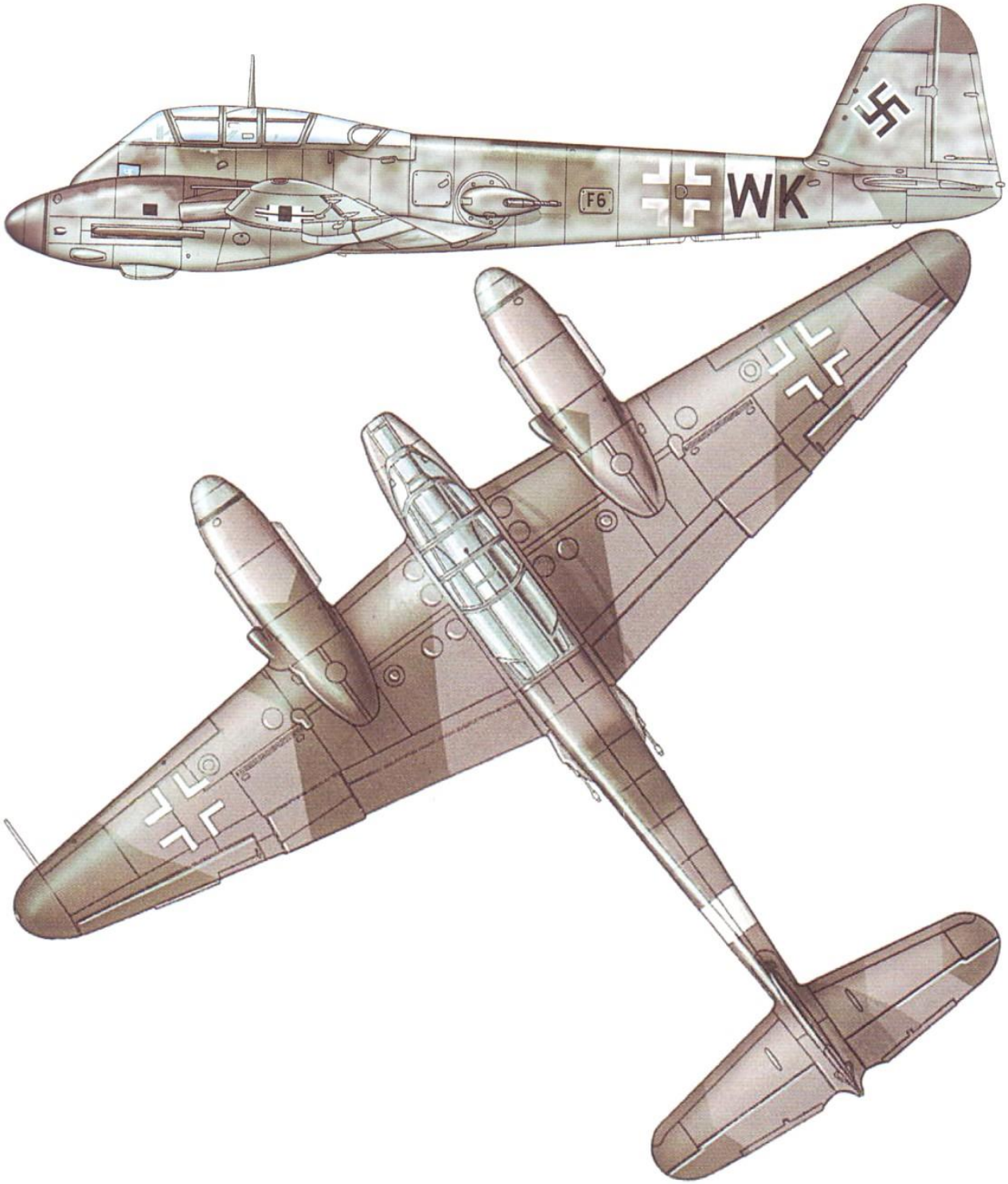
Production et variantes

La production du Me 410 commença par la série des **Me 410A-1**, armé de deux canons MG-151/20 de 20 millimètres et deux mitrailleuses MG-17 de 7,92 dans le nez, la production de chasseurs lourds **Me 410A-2**, armé deux canons Mk-103 de 30 mm, fut elle annulée du fait du retard pris dans la production de ce canon. Trois *Umrüst-Bausätze* (kit de conversion) furent fourni pour l'avion, il s'agissait du **U1** avec un ensemble de caméra pour utiliser l'avion pour la reconnaissance, du **U2** avec deux canons MG-151/20 supplémentaires alimentés à 250 coups, et du **U4** avec un canon BK-5 de 50 mm, approvisionné avec 21 obus. Bien que le BK-5 soit capable de détruire un bombardier à plus de mille mètres, bien au-delà de la portée des mitrailleuses de défense, sa faible cadence de tir et sa faible réserve de munition, firent que les U2 et leurs quatre canons de 20 se révèrent plus utiles. Au début 1944, le **Me 410A-3**, destiné lui aussi à la reconnaissance fut mis en service, son fuselage avait été élargi, et embarquait ainsi plus de caméras et de carburant, il fut utilisé par trois Staffeln (escadrilles), deux à l'est et une à l'ouest.

Toujours au début de 1944, apparut la version Me 410B, sur laquelle, les MG-17 montées dans le nez étaient remplacées par des MG-131 de 13 mm, par contre les moteurs restaient des DB-603A ou AA, en effet le développement du DB-603G de 1900 chevaux qui aurait dû équiper l'avion fut abandonné. Trois variantes B-1, B-2 et B-3, remplacèrent respectivement les A-1, A-2 et A-3. Quelques versions expérimentales furent par ailleurs construites, comme le **Me 410B-5**, un bombardier torpilleur à long rayon d'action, doté du radar FuG 200 Hohentwiel. Les MG-131 de nez avaient été supprimés pour laisser la place au radar , la soute à bombes et les tourelleaux défensifs arrière étaient remplacés respectivement par un réservoir de 650 et 700 litres, un point d'attache sous le fuselage permettant d'embarquer la torpille. La variante B-6, bien qu'elle aussi équipée du FuG 200, était moins profondément modifiée, car destinée à la lutte anti-navire côtière avec des bombes. Les B-7 et B-8, des améliorations du B-3 restèrent elle aussi au stade des prototypes.



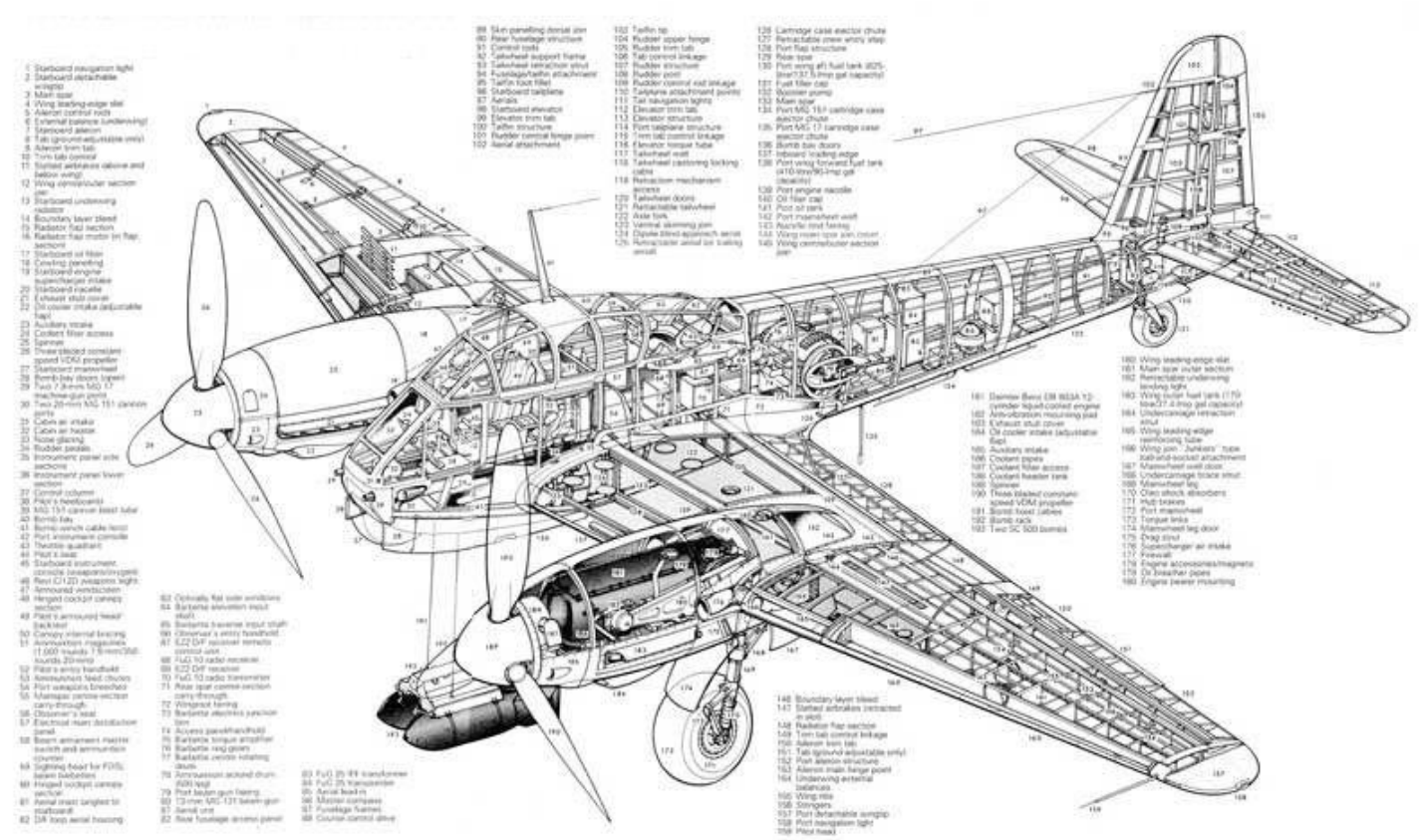
Étudiée pour améliorer les performances en altitude, la variante Me 410C resta elle au stade de la planche à dessin. Deux nouvelles ailes avaient été dessinées, avec 18,25 et 20,45 mètres d'envergure, le train d'atterrissage s'éclipsait alors directement vers l'arrière. Un montage universel des moteurs avait aussi été étudié permettant aussi bien, le montage d'un DB-603JZ, ou bien d'un BMW-801TJ, tous les deux turbocompressés, que d'un Jumo 213 avec un compresseur mécanique à deux étages. Ces moteurs entraînaient une nouvelle hélice quadripale, dont les pales étaient très larges, les deux moteurs à refroidissement liquide employaient le radiateur annulaire du Jumo 213, ce qui avaient permis de supprimer les radiateurs sous les ailes. Néanmoins, aucun de ces avions ne fut construits, la production du Me 410 étant arrêtée, avant que les moteurs n'arrivent à maturité. Le Me 410D, moins ambitieux, atteignit quant à lui la production de série, même si ce fut à quelques exemplaires, il ne différait du B, que par le montage de DB-603JZ, la tentative prévue de le doter de panneaux extérieurs de voilure en bois, pour économiser les matériaux stratégiques, échoua avec la destruction de l'usine de Tegofilm par l'aviation alliée, privant l'industrie allemande de colles performantes pour cet usage. Finalement, en août 1944, la production du Me 410 fut arrêtée pour concentrer les capacités de production sur le Messerschmitt Bf 109, au total 1 160 exemplaires avaient été produits.



Service opérationnel
Dans le rôle de destructeur de bombardiers, l'avion obtint quelques succès contre les formations de l'USAAF non escortées, en particulier ceux du II/ZG26, mais malgré ses bonnes performances, il n'était pas de taille contre les chasseurs d'escorte comme le P-51, ou le P-47, beaucoup plus légers et manœuvrables. Régulièrement les unités de Me 410 furent décimées par les patrouilles de chasseurs alliés opérant autour des streams de bombardiers. Ce même II/ZG26 perdit ainsi douze Me 410, le 13 mai 1944, après avoir été surpris par 20 P-51. À partir de l'été 1944, ils furent retirés des missions de chasse au profit de monomoteurs, comme le Messerschmitt Bf 109, ou le Focke-Wulf Fw 190.

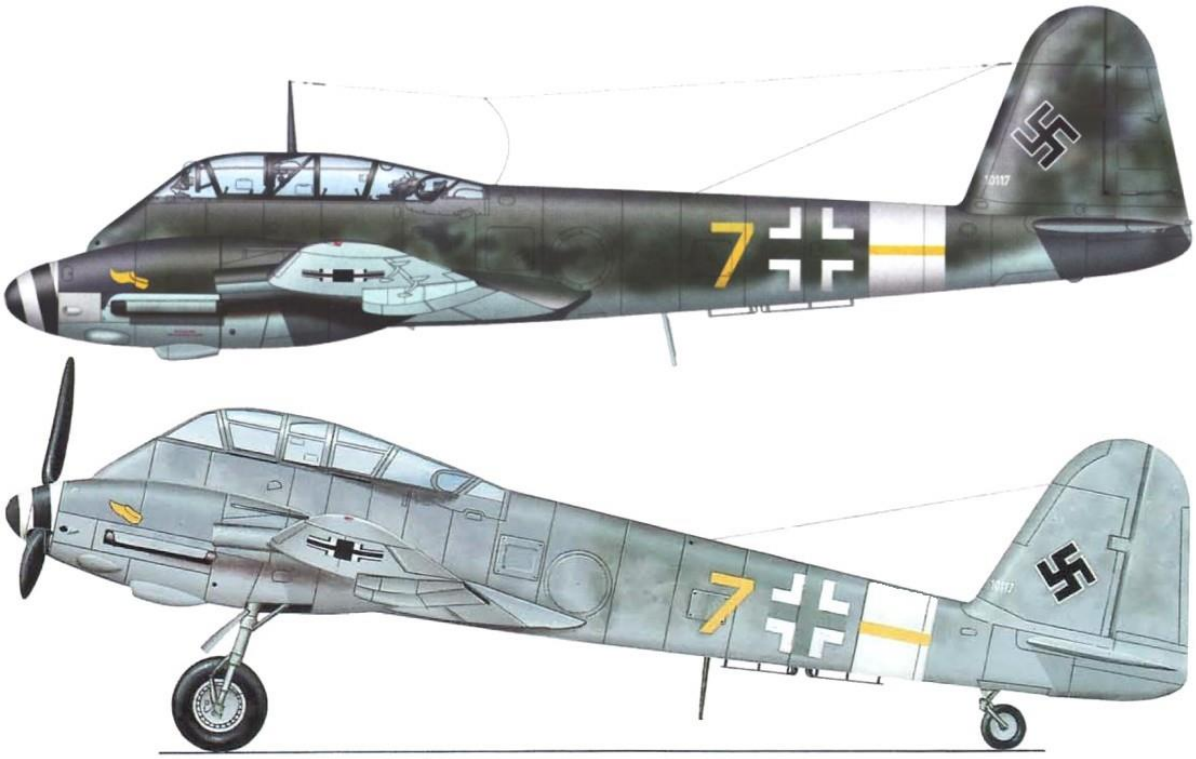
Comme bombardier, le Me 410 se révéla une proie difficile pour les chasseurs de nuit britanniques. La première unité à utiliser l'avion dans ce rôle fut le V/KG 2, qui perdit le premier Me 410, abattu dans la nuit du 13 au 14 juillet 1943 par un Mosquito. Il fut aussi utilisé, avec des Junkers Ju-188 **(en)**, comme avion de reconnaissance à haute altitude, en particulier pendant la bataille de Normandie. De façon générale, l'avion fut apprécié par ses équipages du fait de sa vitesse élevée et de son armement important mais il n'était cependant pas à l'abri des chasseurs modernes des Alliés.

Assez bizarrement, au contraire de son prédécesseur le Bf 110, il se révéla inadaptable à la chasse de nuit malgré des performances comparables à celle du Mosquito. Il commençait tout juste à affronter le chasseur anglais de jour dans la Bataille de l'Atlantique quand le Débarquement mit fin à cette activité.



Survivants

Il existe encore de nos jours, dans le monde, deux Me 410 : le premier est exposé au Royal Air Force Museum London **(en)**, à la base de DCAE Cosford **(en)** (voir photo en tête d'article), l'autre est stocké au National Air and Space Museum, attendant sa restauration.



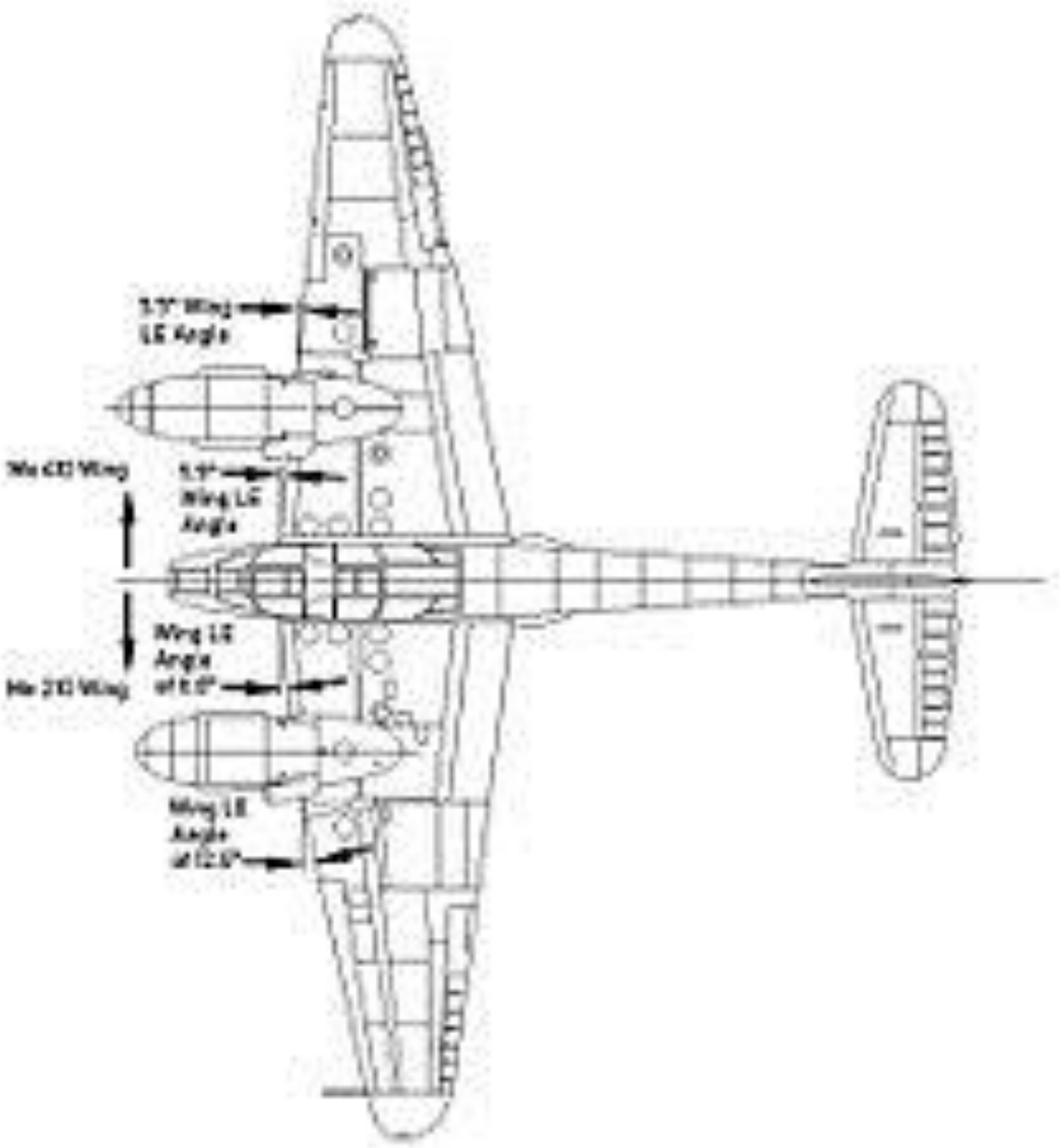
source : https://www.techno-science.net/glossaire-definition/Messerschmitt-Me-410.html

version anglaise

The **Messerschmitt Me 410 *Hornisse*** (Hornet) is a German heavy fighter and *Schnellbomber* used by the *Luftwaffe* during World War II. Though an incremental improvement of the Me 210, it had a new wing plan, longer fuselage and engines of greater power. The changes were significant enough for the aircraft to be renamed the Me 410.

Design and developmen

Development of the Me 210 had been underway since 1939 but the aircraft proved unstable and was never considered for full-scale production. Modifications to the layout produced the Me 210C and 210D, which proved somewhat superior. As studies progressed on the Me 210D, and with a separate parallel attempt to improve upon the 210 with the Messerschmitt Me 310 in the second half of 1943—which provided almost no aerodynamic improvement over the 210's risky handling qualities—it was instead decided to introduce a new model, the Me 410.



Basic side-by-side comparison of the Me 210 and Me 410 wing planforms

The RAF Museum's Me 410, with the doors of its nose bomb-bay open, 2016

The major change between the Me 210 and 410 was the introduction of the larger (at 44.5 litres, 2,720 cu in displacement) and more powerful Daimler-Benz DB 603A engines. They each provided 1,750 metric horsepower (1,730 hp; 1,290 kW) compared to the 1,475 metric horsepower (1,455 hp; 1,085 kW) of the DB 605s used on the Me 210C. The extra power increased the Me 410's maximum speed to 625 kilometres per hour (388 mph), greatly improved rate of climb, service ceiling, and most notably the cruising speed which jumped to 579 km/h (360 mph). The more powerful engines also improved payload capability to the point where the aircraft could lift a war-load greater than could fit into the bomb bay under the nose. To address this, shackles were added under the wings for four 50-kilogram (110 lb) bombs. The changes added an extra 680 kg (1,500 lb) to the Me 210 design, but the extra engine power more than made up for the difference. As with the Me 210, the 410's rear gunner used the same pair of *Ferngerichtete Drehringseitenlafette* FDSL 131/1B turrets mounted on each side of the aircraft, each still armed with a 13 mm (.51 in) MG 131 machine gun, retaining the same pivoting handgun-style grip, trigger and gunsight to aim and fire the ordnance as the 210 did.[1]

The new version included a lengthened fuselage and new, automatic leading edge slats. Both features had been tested on Me 210s and were found to dramatically improve handling. The slats had originally been featured on the earliest Me 210 models, but had been removed on production models due to poor handling. When entering a steep turn, the slats had a tendency to open due to the high angle of attack, analogous to the opening of the slats during the landing approach. (This problem was first observed on the Bf 109V14 and V15 prototypes for the Bf 109E), which added to the problems keeping the aircraft flying smoothly. However, when the problems with the general lateral instability were addressed, this was no longer a real problem. The wing panels of the earlier Me 210 had been designed with a planform geometry that placed the aerodynamic center in a rearwards direction in comparison to the earlier Bf 110, giving the outer sections of the wing planform beyond each engine nacelle a slightly greater, 12.6° leading edge sweepback angle than the inner panels' 6.0° leading edge sweep angle. This resulted in unsuitable handling characteristics in flight for the original Me 210 design.

The new Me 410 outer wing panels had their planform geometry revised to bring the aerodynamic center further forwards in comparison to the Me 210, thus making the leading edge sweepback of the outer panels identical to the inner wing panels with both having identical 5.5° sweepback angles, which improved handling. Deliveries began in January 1943, two years late and continued until September 1944, by which point a total of 1,160 of all versions had been produced by Messerschmitt Augsburg and Dornier München. When it arrived, it was liked by its crews, even though its improved performance was not enough to protect it from the swarms of high performance Allied fighters they faced at this stage of the war.

Operational history

An Me 410A-1/U4 with a BK 5 cannon peels off during an attack on USAAF B-17s

Messerschmitt Me 410A-1/U2 (W. Nr. 420428, 9K+AM) flown by Obfw. Hermann Bolten of the 4./KG 51, shot down June 6th, 1944

The Me 410 night bomber proved to be an elusive target for the RAF night fighters. The first unit to operate over the UK was V./KG 2, which lost its first Me 410 on the night of 13 – 14 July 1943, when it was shot down by a de Havilland Mosquito of No. 85 Squadron RAF.

The Me 410 was also used as a bomber destroyer against the daylight bomber formations of the USAAF, upgraded with *Umrüst-Bausätze* factory conversion kits, all bearing a **/U** suffix, for the design—these suffixes could vary in meaning between subtypes. As one example, the earlier Me 410 A-1/U1 designation signified a camera-fitting in the under-nose ordnance bay for reconnaissance use (as the A-3 was meant to do from its start), while the Me 410 B-2/U1 designation signified a mount of a pair of the long barreled, 30 mm MK 103 cannon in the undernose ordnance bay. The /U2 suffix designated a fitment of two additional 20 mm MG 151/20 cannons in the under-nose ordnance bay instead—the A-1/U4 subtype fitted the massive, 540-kilogram (1,190 lb) *Bordkanone* series 50 mm (2 in) BK 5 cannon, loaded with 21 rounds in the same under-nose ordnance bay in place of either the /U1's cameras or MK 103s, or the /U2's added pair of MG 151/20 autocannon. For breaking up the bomber formations, many Me 410s also had four underwing tubular launchers, two per wing panel, firing converted 21 cm (8 in) *Werfer-Granate* 21 infantry barrage rockets. Two *Geschwader*, *Zerstörergeschwader* 26 and 76, were thus equipped with the Me 410 by late 1943.

They were moderately successful against unescorted bombers through 1943, with a considerable number of kills against USAAF day bomber formations being achieved. However, the Me 410 was no match in a dogfight with the lighter Allied single-engine fighters such as the North American P-51 Mustang and Supermarine Spitfire. In early 1944, the Me 410 formations encountered swarms of Allied fighters protecting the bomber streams, usually flying far ahead of the combat box formations as an air supremacy move in clearing the skies of any Luftwaffe opposition, resulting in the Me 410's previous successes against escorted bombers now often being offset by their losses. An example of this—as part of a campaign started two days earlier by the USAAF—was on 6 March 1944 during an attack on Berlin by 750 8th AF heavy bombers, when 16 Me 410s were shot down in return for eight B-17s and four P-51s (which were destroyed by Bf 109 and Fw 190 fighters escorting the Me 410s). The following month on 11 April, with 8th AF raids hitting Sorau, Rostock and Oschersleben, II./ZG 26's Me 410s accounted for a rare clear success, initially bringing down 10 B-17s without any losses. During the course of the same raid, their second sortie was intercepted by P-51s that destroyed eight Me 410s and three Bf 110s. Sixteen crewmen were killed and three wounded.

From mid-1944, despite being Hitler's favourite bomber destroyer, the Me 410 units were taken from Defence of the Reich duties and production was phased out in favour of heavily armed single-engine fighters as dedicated bomber destroyers, with the Me 410s remaining in service flying on reconnaissance duties only. Some Me 410s were used with Junkers Ju 188s during the Battle of Normandy, for high-altitude night reconnaissance.

Variants

A-series aircraft were armed with two 7.92 mm (.312 in) MG 17 machine guns and two 20 mm MG 151/20 cannons in the nose and delivered as the **Me 410 A-1** light bomber. The **Me 410 A-2** heavy fighter was cancelled because the dual 30 mm (1.18 in) MK 103 cannon mount, also available for the later **Me 410B-2** subtype as the *Umrüst-Bausatz* /U1 factory kit available by 1944, was not ready in time.

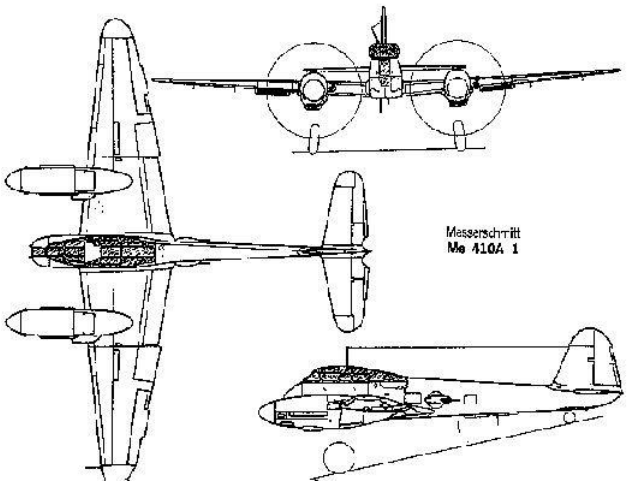
The Me 410A featured a bomb bay for carrying bombs. Though by fitting conversion kits, this could be used for other equipment. Initially, three *Umrüst-Bausätze* (factory conversion kits) were available: the **U1** which contained cameras for photo-reconnaissance, the **U2** with two 20 mm MG 151/20 cannon with 250 rounds-per-gun for the heavy fighter. And the **U4** with a 50 mm (2 in) *Bordkanone*, BK-5 cannon with 22 rounds (21 rounds to load and 1 extra round in the breech). The purpose of this was to convert either an Me 410A or B-series aircraft into a bomber destroyer.

The BK 5 cannon - derived from the 50 mm (2 in) KwK 39 L/60 of the Panzer III tank - allowed Me 410s to shoot at their targets from over 914 m (1,000 yd), a distance far greater than the range of the bombers' defensive machine-guns.

However, in practice frequent problems with jamming, the limited ammunition supply and with the extra 540-kilogram (1,190 lb) weight of the large-calibre gun under the nose made the other anti-bomber versions of Me 410, especially those with extra 20 mm MG 151/20s, much more useful. The reconnaissance version **Me 410 A-3** received a deeper fuselage for additional cameras and fuel. The Me 410 A-3 entered service in small numbers in early 1944 and equipped three long-range reconnaissance *Aufklärungsstaffel* squadrons, usually grouped larger, three or four-squadron *Fernaufklärungsgruppen* (one *Gruppe* on the Western Front and the other two on the Eastern Front). The **Me 410B**-series was similar to the A-series but replaced the pair of 7.92 mm (.312 in) MG 17s with 13 mm (.51 in) MG 131 machine guns. The originally planned 1,900 hp (1,400 kW) DB 603G engine had been cancelled in early 1944, so all Me 410Bs used DB 603A or DB 603AA engines. The DB 603G would have increased the maximum speed to 630 kilometres per hour (390 mph) and cruising speed to 595 kilometres per hour (370 mph), although the weight increased once again. The versions were the same as with the A-series, the **Me 410 B-1** and **Me 410 B-3** filling the same roles as the earlier A-1 and A-3 versions, also with the option of using the same *Umrüst-Bausätze* factory conversion kits as the A-series.

Several experimental models were also developed. The **Me 410 B-5** added shackles under the fuselage to carry a torpedo, and removed the MG 131s in the nose to make room for the FuG 200 *Hohentwiel* 550 MHz UHF-band maritime patrol radar. The bomb bay was not used in this version in order to make room for a 650-litre (170 US gal) fuel tank, and the rearward-firing remote turrets were replaced by another 700 L (180 US gal) fuel tank for long-range missions. The **Me 410 B-6** was a similar anti-shipping conversion, but intended for the short-range coastal defence role only. For this mission, it did not use a torpedo, and was instead a simple modification of the B-1 with the FuG 200 radar. The **Me 410 B-7/B-8** were updated B-3 reconnaissance models that were only built as prototypes. The **Me 410C** was a high-altitude version drawn up in early 1944, with two new wing designs that increased span to 18.25 or 20.45 metres (59.9 or 67.1 ft). The larger wings allowed the gear to retract directly to the rear. A new universal engine mount would allow for the use of any of the DB 603JZ or BMW 801J turbocharged engines or the Jumo 213E two-stage mechanically supercharged engines, driving a new four-blade propeller with very wide blades. The BMW 801 radials were air-cooled and the DB 603 and Jumo 213 used an annular radiator, all *Kraftei* (power-egg) engine "modules" onto an airframe for ease of installation and field maintenance, so the normal under-wing radiators were removed. None were ever built, as Me 410 production was canceled before the engines matured.

The **Me 410D** was a simpler upgrade to the B-series to improve altitude performance than the C-series. It would be powered by the DB 603JZ engines, and had a revised forward fuselage to increase the field of view of the pilot and reduce drag. It also replaced portions of the outer wing panels with ones made of wood to conserve strategic materials. Several were built, but like many other attempts at wood construction by the German aviation industry late in World War II, the loss of the Goldschmitt Tego film factory in Wuppertal, in a Royal Air Force night bombing raid, meant the acidic replacement adhesives available were too corrosive to the materials being bonded, and the wooden portions tended to fail. Production was eventually cancelled to concentrate on Bf 109Gs in August 1944, after 1,160 Me 410s had been built, the month after the *Jägernotprogramm* had gone into effect.



Surviving aircraft

Me 410, W.Nr.10018, (*FE499*) after being sent to the United States

Two Me 410s survive:

Me 410 A-1/U1 (W.Nr.10018, converted from Me 210 airframe)
This Aircraft held by the American National Air and Space Museum and stored awaiting restoration, at the Paul E. Garber Preservation, Restoration, and Storage Facility, located in Suitland Maryland. It was found intact at an airfield in Trapani, Sicily, in August 1943 bearing the markings of the Luftwaffe's 2.*Staffel*/*Fernaufklärungsgruppe* 122 and was shipped to the United States in 1944; it was given the US serial number *FE499*,

Me 410, W.Nr.420430, RAF Museum Cosford (2009)

Me 410 A-1/U2 (W.Nr.420430)
This aircraft is part of the collection of the RAF Museum and is publicly displayed at the Royal Air Force Museum Cosford. It was built in late 1943 by Messerschmitt in Augsburg. There is evidence it served with Zerstörergeschwader 26 before being surrendered at Vaerlose, Denmark in May 1945. It was one of six Me 410s that were taken to the UK in 1945 for evaluation, but the only one to be later selected for preservation and to avoid being scrapped. It underwent restoration in 1986, after which both engines were successfully run on the ground. It was moved to Cosford in 1989 and has remained there since.

Specifications (Me 410 A-1/U-2)

General characteristics

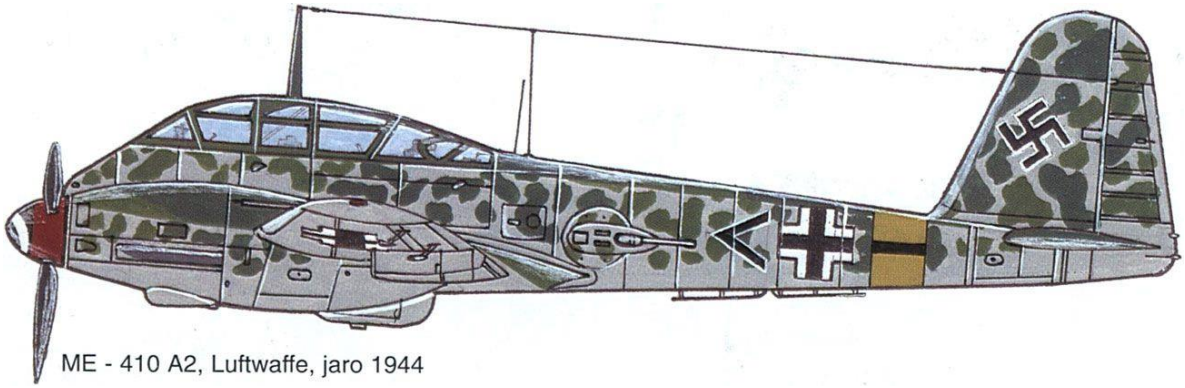
- **Crew:** 2
- **Length:** 12.484 m (40 ft 11.5 in)
- **Wingspan:** 16.3513 m (53 ft 7.75 in)
- **Height:** 4.280 m (14 ft 0.5 in)
- **Wing area:** 36.2031 m^2 (389.687 sq ft)
- **Airfoil: root:** NACA 23018-636.5; **tip:** NACA 23010-636.5
- **Empty weight:** 7,518 kg (16,574 lb)
- **Gross weight:** 9,651 kg (21,276 lb)
- **Fuel capacity:** 550 imp gal (660 US gal; 2,500 L) in four wing tanks
- **Powerplant:** 2 × Daimler-Benz DB 603A V-12 inverted liquid-cooled piston engines, 1,290 kW (1,750 hp) each for take-off
  1,360 kW (1,850 PS) at 2,100 m (6,890 ft)
  1,195 kW (1,625 PS) at 5,700 m (18,700 ft)
- **Propellers:** 3-bladed VDM constant-speed propeller

Performance

- **Maximum speed:** 507 km/h (315 mph, 274 kn) at sea level, 624 km/h (388 mph; 337 kn) at 6,700 m (21,980 ft)
- **Cruise speed:** 587 km/h (365 mph, 317 kn)
- **Range:** 1,200 km (750 mi, 650 nmi) at maximum continuous cruise speed, 1,690 km (1,050 mi) at economical cruise speed
- **Ferry range:** 2,300 km (1,400 mi, 1,200 nmi)
- **Service ceiling:** 10,000 m (33,000 ft)
- **Time to altitude:** 6,000 m (20,000 ft) in 10 minutes 42 seconds

Armament

- **Guns:** ** 2 × 7.92 mm (0.31 in) MG 17 machine guns with 1,000 rpg, firing forward
  - 2 × 20 mm (0.79 in) MG 151/20 cannon with 350 rpg, firing forward
  - 2 × 20 mm (0.79 in) MG 151/20 cannon with 250 rpg in the bomb bay, firing forward
  - 2 × 13 mm (0.51 in) MG 131 machine guns with 500 rpg, each firing rearward from FDSL 131/1B remote-operated turret, one per side
- **Rockets:** 4 × 21 cm (8.3 in) *Werfer-Granate* 21 rockets
- **Bombs:** up to 1,000 kg (2,200 lb) of disposable stores


ME - 410 A2, Luftwaffe, jaro 1944

source : https://en.wikipedia.org/wiki/Messerschmitt_Me_410_Hornisse