WILLY MESSERSCHMITT – MESSERSCHMITT Bf 109E

Wilhelm Emil "Willy" Messerschmitt, 26 June 1898 – 15 September 1978

Figure 1 *- Willy Messerschmitt, shortly after graduating as a Diplom Ingenieur/Graduate Engineer from the Technische Hochschule, Munich in 1923.*

September 2021 will mark 81 years since the historic Battle of Britain reached its peak over south-east England in 1940. One of the central aircraft involved was Germany's Messerschmitt Bf 109E fighter. The aircraft's origins stemmed from the mind of Willy Messerschmitt, a German aeronautical engineer whose life, both pre and post WWII, was spent in the aviation industry.

The focus of this article is the Messerschmitt Bf 109E, with which Germany went to war in 1939, fighting over Poland, France and England. More than 3,500 Bf 109Es were built, consisting of several variants and sub-variants, until replaced by the Bf 109F series in 1941. In the period covered below, from September 1939 until October 1940, the predominant Bf 109Es were E-3, E-4 and E-7 variants.

EARLY DAYS

The son of a wine merchant, Willy Messerschmitt's fascination with aviation may have begun when, as an eleven year old, he first observed a Zeppelin airship at Friedrichshaven on Lake Constance. He maintained his aviation interests throughout his schooling and teenage years, becoming particularly involved with gliding. In 1918, he enrolled at the Munich Technics Hochschule (Technical University of Munich) as a student of mechanical engineering, graduating in 1923 as a Ingenieur (Graduate Engineer). At this time, aeronautics was not a recognised degree subject, yet Messerschmitt succeeded in persuading the university to accept the design of his S 14 glider as the thesis for his degree.

Bf 109 – A CLOUDED BEGINNING

For an aircraft that became almost a household name in WWII, the Bf 109's birth was clouded in political intrigue, never being assured of seeing a production line. Even so, approximately 33,000 plus Bf 109s were built.

Looking back. In 1928, Willy Messerschmitt, co-owner and director of Bayerische Flugzeugwerke, (BFW), (Bavarian Aircraft Works) had clashed with Erhard Milch, then head of Lufthansa. The discord stemmed from the fatal crash of a BFW prototype M 20 aircraft on its initial flight, along with the death of its pilot, a friend of Milch. Two more M 20s were lost by April 1931. This saw Lufthansa cancel an order for 10 M 20s (which was later reinstated

Figure 2 *- Erhard Milch, former head of Lufthansa. The 1928 fatal crash of a Messerschmitt passenger aircraft and the pilot on its initial test flight, led to a long and bitter relationship between Milch and Messerschmitt. The accident eventually led to Messerschmitt's company being declared bankrupt in 1931, until cleared of all charges to resume trading in 1933.*

following an enquiry) and BFW forced into bankruptcy, from which it did not emerge until May 1933. Messerschmitt and Milch's relationship was forever to remain adversarial.

In 1934, the German Air Ministry (RLM) issued specifications to several large German aviation firms for a monoplane fighter aircraft to equip the revamped German Air Force (Luftwaffe). Willy Messerschmitt learnt there were those within the RLM who would not consider a BFW proposal should one be put forward. Under these clouds of uncertainty, Messerschmitt chose to proceed with his own design work. A delicate situation had been reached, as Milch had now risen to become Secretary of State for Air (RLM). As a counterpoint, Messerschmitt had developed personal friendships with Ernst Udet and Rudolf Hess, both former WWI pilots now occupying senior positions in the Nazi party; in particular, Hess, was then Hitler's deputy. Eventually Messerschmitt was advised to submit his design, on which he and his team had continued to work, their prime aim being to produce the smallest possible airframe, combined with the most powerful engine available. Three prototypes were built, powered by Rolls Royce Kestrel engines, due to production delays with the Daimler-Benz engines. The Bf 109 V1 prototype ("V", indicating Versuchs or test) maiden flight was made from Augsburg in September 1935.

Flight trials commenced in October 1935 with both Focke-Wulf and Arado soon being eliminated, leaving Heinkel and Messerschmitt as the main contenders. Surprisingly, it was announced before the test progamme had finished, that Messerschmitt's Bf 109 was the successful aircraft to fill the Luftwaffe's fighter role. The reasons given were its better performance, that it was lighter and would be cheaper to mass build.

FURTHER DEVELOPMENT

Series production commenced with the Bf 109B, followed by C and D models, reaching the Bf 109E at the beginning of WWII; there was no A series. Each series were preceeded by one or several "V" test aircraft to evaluate various updates.

Figure 3 *- Bf109V 4 (V=Versuchs / test aircraft). Armed with three MG 17, 7.92 mm machine guns, the third fired through the propeller hub.*

For a short period, V4, along with V3 and V5 were combat trialled in Spain with the German Kondor Legion during the Spanish Civil War. Here they proved themselves successful against opposition fighters.

The Bf 109V3 was the first of type to carry armament, with two MG 17, 7.92 mm machine guns in the upper cowling, while the V4 added an MG 17 to fire though the propeller hub. These aircraft led the transition into the Bf 109B series.

Meanwhile, in July 1936, Spain's General Franco sought assistance from Adolf Hitler to overcome the Republican forces in the Spanish Civil War (1936-1939). Germany's response was the Kondor Legion that included elements of the Luftwaffe. Also dispatched were three test Bf 109s, V4, V5 and V6, to be trialled under combat conditions. Following a three month period, they returned to Germany having shown themselves to be superior in performance against Russian Polikarpov I-15 and I-16 fighters. Some 140 plus Bf 109 B, C and E models were eventually operated by Franco's Nationalists.

Further modifications were made to two Bf 109B airframes (V8 and V9), including a Jumo 210 G engine with direct fuel injection and a two-bladed variable pitch propeller. These changes led to the Bf 109C series going into production in 1937. Three "V" test Bf 109s (basic Bf 109Bs airframes) were also trialled, for the first time fitted with the Daimler-Benz DB 600Aa engines of 925 hp. Willy Messerschmitt had decided to use one of these aircraft, Bf 109 V13 in an attempt to break the absolute speed record for landplanes. If successful, the resulting prestige for the German aircraft industry, particularly Messerschmitt and Willy Messerschmitt, would be immense. The aircraft was powered by a special Daimler-Benz DB 601A engine, capable of producing 1650 hp only for a limited time. The venturi tube was removed, leaving the pilot without an airspeed indicator. All apertures were taped over, the aircraft polished to a high degree and a streamlined cockpit canopy designed. Special spark plugs made by Bosch and fuel allowing higher compression for a limited time were developed. To both Germany and the world, it was announced this aircraft was a standard Bf 109!! On 11 November 1937, Dr Hermann Wurster, Messerschmitt's chief test pilot, set a new world airspeed record of 620 km/h / 384 mph.

By mid 1937, production had commenced on the latest variant, the Bf 109D. The aircraft was powered by a Jumo 210D engine and armed with four x MG 17 machine guns, two mounted in the upper engine cowling and one in each wing. A total of 650 D models were built, 10 being sold to Switzerland. Hitler's massive re-armament plans were well under way by the mid 1930s, being reflected at BFW's Augsburg plant, with the expansion of hangars No1 and No2. Additional construction included hangars No3 and No4 and new administration and design bureau buildings. At Regensburg, approximately 85km/138ml east of Augsburg, another production plant was built in 1936/1937, while Bf 109 production licence rights were sold to ERLA (Leipzig), Fieseler (Kassel) and Focke-Wulf (Bremen). Even during this rapid growth period for BFW, Chairman/Managing Director Willy Messerschmitt still had his detractors: "a new comer with limited experience". Nevertheless, many held him in high regard as evidenced by a number of awards:

- Honorary Professor of the Munich technical college, from where he graduated;
- Membership of the German Academy for Aviation Research;
- The Golden Ring of Honour of the German Association of Engineers;
- The Lilienthal coin for pioneering constructive performances of the first order.

Chiming in on the recognition being bestowed on Willy Messerschmitt were Goebbels (Propaganda Minister) and Hess, who, aided by overall shareholder support, renamed the company from BFW to Messerschmitt AG. In future, all aircraft after the Bf 109 and Bf 110 would be prefaced Me, such as Me 163, Me 262.

MESSERSCHMITT Bf 109E

The development path of the Bf 109E was similar to that of previous models. Two "V" test aircraft, V14 and V15, out of the D model order, were utilised to develop the Bf 109E series. The end of 1938 heralded the much awaited arrival of the Daimler-Benz DB 601 engine of 1,100 hp, with direct fuel injection. To overcome heating problems generated by the DB 601 engine, two radiators were buried in the wings and a small oil cooler remained below the engine. The first models were Bf 109E-1s. Initial armament consisted of four X MG 17, 7.92 mm machine guns, two engine mounted and one in each wing. Other E-1s had two MG 17s engine mounted and one MG FF 20mm cannon in each wing; a cockpit selector switch gave the choice of firing either cannon or machine guns or both. Empty and maximum loaded weights were 4360 lb / 1980 kg and 5,400 lb / 2,450 kg, respectively. Maximum speed was 355 mph / 570 km/h at 12,300ft / 3,750m. Almost 3,500 "E" types were built, consisting of 10 variants plus seven sub-variants, with the first of type reaching Luftwaffe *staffeln* (squadron) in February 1939.

THE "E" GOES TO WAR.

When Germany went to war on 1 September 1939, Luftwaffe figures indicate almost 950 serviceable Bf 109E-1 fighters. Neither Messerschmitt AG or the sub-contracting companies were anywhere near full production capacity. This extraordinary situation continued for the first 2-3 years of the war, those in command believing German superiority would lead to a "short" war !!

***Figure 4** -The cramped cockpit of a Bf109E*

Only a limited number of Bf 109E-1 fighters were committed to the Polish campaign (1-28 September 1939). Of the estimated 200 Bf 109s involved, 67 were lost, mainly to ground fire. The rationale behind the restricted numbers of Bf 109s was due to limited Luftwaffe resources. The fear of Britain and France invading Germany in support of Poland, led to the majority of Luftwaffe units being retained in the west to oppose such a move.

On 4 September 1939, a Bf 109E-1 claimed the Luftwaffe's first RAF victims when 15 RAF Wellington bombers set out to attack the two German capital ships, Gneisenau and Scharnhorst, moored in the River Elbe off Brunsbutell. Defending 109s shot down two Wellingtons. A repeat daylight attack against German naval assets on 18 December 1939, by 22 unescorted Wellington bombers, resulted in 12 of the attacking force shot down and three damaged. Bomber Command soon changed tactics, abandoning daylight raids in favour of the night time offensive.

The advent of the 1939/1940 winter brought a pause to operations over the Western front, with limited contact between both allied and Luftwaffe forces. What was known as the "Phoney War" erupted on 10 May 1940, when German forces invaded the low countries and France. In late 1939, a new variant, the Bf 109E-3 had began rolling off the assembly lines, reaching Luftwaffe fighter units by the end of the year. Powered by a DB601Aa, 12 cylinder inverted-vee liquid cooled engine, it was rated at 1,175 hp for take-off. Maximum speed ranged from 467 km/h / 290 mph at

sea level, to 560 km/h / 348 mph at 4,440 m / 14,560 ft. Max range 660 km / 410 ml. All up weight (AUW) 2,665 kg / 5,875 lb. Armament included the addition of a 20 mm MG FF/M cannon mounted between the cylinder banks of the inverted vee engine, firing through the propeller hub. In practice, it was found the weapon was prone to vibrating, over-heating and seizing and therefore was either not used or removed.

For the invasion of France, the Luftwaffe had just in excess of 1,000 Bf 109 fighters available, the majority being the E model,of which almost 240 were lost in combat. Opposing the German forces was a small allied air component of the Advanced Air Strike Force (AASF) of Hurricane fighters and Fairey Battle light bombers. Vastly outnumbered by the Luftwaffe, the RAF crews fought and died with great gallantry, until forced to retire to England by mid- June 1940. Among the pilots engaged in this uneven struggle were South Australian pilots, John Cock and Leslie Clisby flying Hurricanes, and Robert Bungey flying Battles. Only Cock would survive the war.

During the French campaign thought had been given to adapting Bf 109s to operate as fighter-bombers (*Jagdbomber*) referred to as *Jabo.* Trials were carried out using the "Revi" gun sight as a bomb sight. A red line was also painted on each side of the cockpit at 45 degrees to the horizon, to enable the pilot to place the aircraft into the correct diving angle. Following successful trials, an additional *Jabo staffel*, of 9-12 aircraft, was formed within each *Jagdgeschwader*, a fighter wing of 100-150 aircraft, which was then divided into three *Gruppen*, each with 3-4 *Staffel*. A number of Bf 109E-1 aircraft were converted to a *Jabo* configuration, able to carry a single 50 kg / 110 lb bomb, and were redesignated as Bf 109E-1/B. Further conversion of Bf 109E-1s to the same standard as the latest variant, ie the Bf 109E-4/B, allowed both aircraft in the *Jabo* role to uplift either four x 50 kg / 110 lb or one 250 kg / 550 lb bomb via a central fuselage rack.

As the evacuation of allied troops from the beaches of Dunkirk began, Bf 109s began encountering RAF Spitfires for the first time. Adding to the Luftwaffe's problems was Germany's rapid advance across France, where logistically it was proving difficult for Luftwaffe ground crew to keep pace with their fighter units. At times, serviceable Bf 109s sat idle on the ground due to a lack of fuel. When the French campaign ended towards the end of June 1940, most Luftwaffe units were below strength. There was no shortage of pilots, the problem centred around the limited numbers of Bf 109s leaving the production lines, on average, about 150 a month.

Following the fall of France, Luftwaffe establishment strength across most units needed rebuilding. Combat experience led to heavier cockpit framing, including a curved armour plate over the pilots head and additional seat armour. By mid-summer 1940, the Bf 109E-4 model began replacing the E-3. Prime changes included replacing the nose cannon with a MG FF 20 mm cannon in each wing and installation of the Daimler-Benz DB 601N powerplant. The engine piston heads were flattened, instead of the normal concave shape, increasing compression ratio by 15 per cent and requiring a higher fuel rating from 87 to 96 octane.

THE BATTLE OF BRITAIN.

Officially the Battle Of Britain is recorded as being fought between 10 July 1940 and 31 October 1940. Commencing 10 July 1940, Luftwaffe units began attacking British coastal shipping proceeding through the English Channel, which the Germans referred to as the *Kanalkampf* (Channel Battle). Luftwaffe fighters were able to put into effect tactics learnt in Spain, flying either as a pair (*Rotte*) or as finger four (*Schwarm*). Engaging RAF squadrons lacked this flexibility; it would take some time for the RAF to change from their tight vee formations. As their numbers increased, Bf 109s began sweeps across Kent, when circumstances allowed, hoping to engage the RAF.

Bf 109 pilots soon became aware of another problem that required constant monitoring, fuel. The aircraft carried an internal fuel load of 410 l / 88 gal or about 90 minutes flight time. Taking into account fuel demands made in climbing to altitude and combat, the E-3 and E-4 were limited to about 10-20 minutes over England. In one

instance, a Bf 109 pilot observed on his return flight to base, seven of his *Gruppe*, of about 40 aircraft, ditching into the Channel and another five belly landing in France due to fuel starvation. A 300 l / 66 gal drop tank had been developed, made of moulded plywood, but it was were found to leak badly when exposed to the elements. The problem was not overcome until late August 1940, with the arrival of the Bf 109E-7. Fuselage shackles enabled either a light alloy drop tank of the same 300 l capacity, which gave the aircraft a range of 1,300 km / 820 m, or a single 250 kg / 550 lb bomb.

Figure 5 *- The fate many Bf109s suffered during the Battle of Britain due to battle damage or fuel starvation. Internal fuel of 88gal/400L only gave the Bf109E-3 and E-4 a maximum of 10-20 mins over England. As a result, a number of returning 109s ditched in the English Channel or crash landed in France. The arrival of the E-7* variant with a 300 l / 68 gal alloy drop tank came too late to have any influence.

Figure 6 ***-****Probably, Germany's best known WWII fighter pilot, Adolph Galland, seated in a Bf109E. Clenching on a cigar,….he requested the installation of an ashtray in the cockpit. Credited with 104 kills, he served as General der Jagdflieger/Inspector of Fighters from November 1941 to January 1945. He then flew Messerschmitt Me 262 jet fighters until 26 April when he was shot down, wounded but survived.*

By mid August, Junkers Ju 87 (*Stuka*) dive bombers had been withdrawn from battle due to their high loss rates. At the same time, the twin engined Messerschmitt Bf 110, designed as a long range escort fighter for the bombers, was found wanting when up against Spitfires and Hurricanes. Göring, the head of the Luftwaffe, suggested Bf 109s escort the escorts, ie Bf 110s!. With such muddled thinking, Göring then insisted Bf 109 pilots fly close escort to the bombers, at reduced speed, where the latter crew could actually watch them through their cockpit windows! In one foul swoop, the 109 pilots lost the tactical advantages of height and speed, which up to now had proven so successful in Spain, Poland and France.

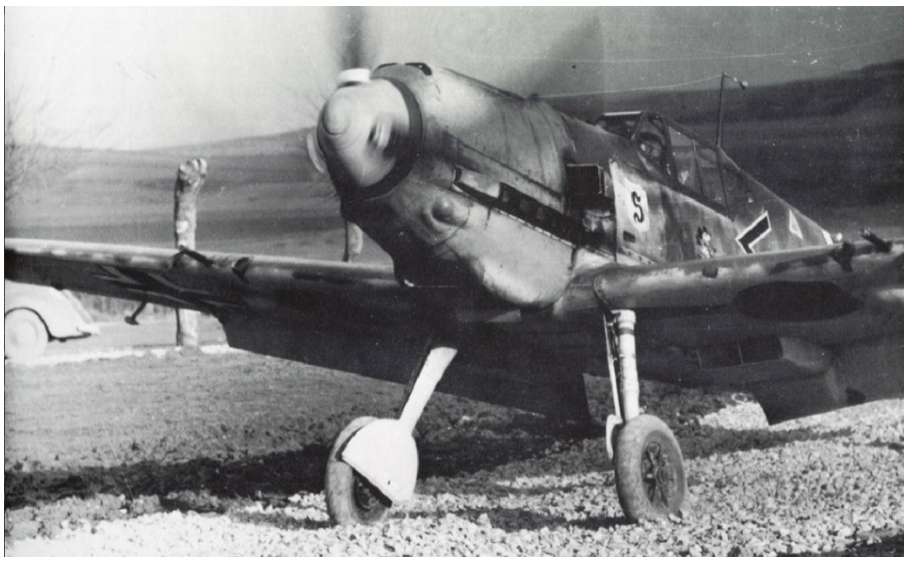

Figure 7 - *Then Major Galland, taxiing his Bf109E-3 at Caffiers, France 1940. Note the narrow track under-carriage, the cause of many 109 accidents during the aircraft's career.*

Between 24 August 1940 and 6 September 1940 was referred to by the RAF as "the critical period". In that time, RAF Fighter Command lost approximately a fifth of their pilots, either killed, wounded or missing. Of the remainder, nearly 25% were inexperienced, with only a few hours accumulated at an Operational Training Unit (OTU) on Spitfires or Hurricanes. During this period, fighter production did not keep pace with RAF losses, Fighter Command losing 200 more Spitfires and Hurricanes than they received. This phase was an all out attempt to destroy Fighter Command, which the Luftwaffe, until that point, had not been able to achieve. The targets were RAF 11 Group's sector fighter airfields, some of which were situated on the channel coast, with Manston, Hawkinge and Lympne virtually under the attackers' flight path. Inbound raids, several in a day, would often consist of 100-150 bombers, escorted by double that number of Bf 109s. Having crossed the English coast, small groups of bombers would break away to attack 11 Group airfields, leaving the 109s to engage RAF fighters or free to strafe airfields, if opportunity allowed. So successful had these tactics proven that, by early September 1940, only two of 11 Group's airfields, Kenley and Tangmere, were still operational.

As is well known, history has strange twists. None more so than the befuddled decision by Gemany's High Command to switch from the Luftwaffe's concentrated attacks on Fighter Command to an aerial assault on London. On the evening of 24/25 August 1940, a navigational error by a German crew resulted in their bombs falling on the City of London. The following night, a force of RAF bombers was dispatched on a retaliatory strike to Berlin. After several more RAF raids on Berlin, Hitler gave his approval for air strikes against London. Göring and his air fleet commanders saw this as an opportunity to deliver a knock out blow to Fighter Command. They believed the RAF would have no choice other than to rise to defend the capital from aerial assault. No doubt the *OKW* (German High Command) also had in mind *Operation Sealion,* the proposed cross channel invasion, pencilled in for 15 September 1940.

The first massed attack on London began on 7 Septeber 1940 with approximately 1,000 aircraft, of which two thirds were escorting Bf 109Es. Göring and his entourage were standing below this arial armada as it crossed the French coast, having decamped from his personal train! Expecting that attacks were going to be against sector airfields, the RAF Controller held most of his fighters to the north of the Thames, allowing the bombers to hit wharves and factories along the Thames in East London. Luftwaffe bombers returned to London again that night and for the next 76 consecutive nights, except one due to weather. Lost on this day was New South Wales pilot, Flight Lieutenant Pat Hughes, Australia's top scoring Battle of Britain pilot, credited with 17 kills, including three shared, at the time of his death. Also lost on this day, was South Australian pilot, Flight Lieutenant Richard Carew Reynell, from a well known South Australian wine making family, from whom the nearby town of Reynella derived its name. At the time, he was flying a Hurricane with RAF No 43 Sqn.

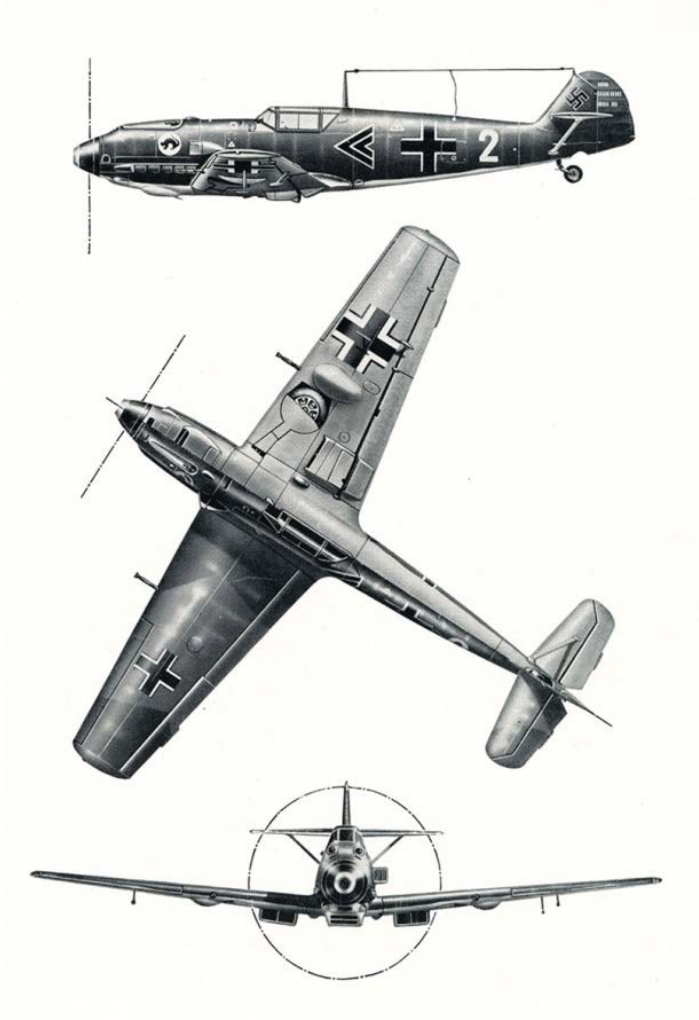

Figure 8 *- Bf109E-3 Three-dimensional plan of aircraft.*

Having learnt from 7 September, RAF Controllers were better able to place their fighter squadrons for the next major attack on 9 September. Flying in two separate columns, Luftwaffe bombers were intercepted by defending RAF fighters, forcing them to drop their ordnance early and return to France, having achieved very little. By the end of this week in September 1940, RAF storage depots show a reserve component of approximately 130 Hurricanes and Spitfires. An interesting and revealing statistic. It indicates how well Dowding (C in C), Fighter Command, and Park (C in C, 11 Group) had handled their resources of pilots and aircraft to this point, considering the lead held by Germany. The next major assault occurred on Sunday, 15 September 1940, now celebrated as Battle of Britain Day. Not that it was realised at the time, the day represented the high water mark of the battle. RAF fighters from 10, 11 and 12 Groups intercepted the invaders, directed by ground control who co-ordinated information received from radar plotters and ground observers. Luftwaffe crew no doubt remembered being advised, via often faulty intelligence reports, that the RAF were down to their last 50-100 fighter aircraft. This, however, was not what they were observing from their cockpits. At the end of the day, RAF losses stood at 26 aircraft and 60 for the Luftwaffe. Daylight attacks were still mounted on London over the remainder of September, although they were lacking both in numbers and intensity. Luftwaffe bomber squadrons had suffered significant losses at the hands of the RAF. Even so, they still maintained a night offensive against a wide range of targets throughout the UK until May 1941, when they were withdrawn to prepare for operation *Barbarossa,* the invasion of Russia.

Bf 109E-3 Specification

Power Plant: One Daimler-Benz DB 601Aa 12-cylinder inverted-vee liquid-cooled engine rated at 1,175 h.p. for take-off, 1,000 h.p. at 12,140 ft. (3 700 m), and 775 h.p. maximum continuous.

Performance: (At 5,875 lb./2 665 kg) Maximum speed, 290 m.p.h. (467 km/h) at sea level, 307 m.p.h. (494 km/h) at 3,280 ft. (1 000 m), 322 m.p.h. (518 km/h) at 6,560 ft. (2 000 m), 348 m.p.h. (560 km/h) at 14,560 ft. (4 440 m), 336 m.p.h. (542 km/h) at 19,685 ft. (6 000 m); maximum continuous cruise, 300 m.p.h. (483 km/h) at 13,120 ft. (4 000 m); range cruise, 202 m.p.h. (325 km/h) at 3,280 ft. (1 000 m), 210 m.p.h. (338 km/h) at 6,560 ft. (2 000 m), 233 m.p.h. (375 km/h) at 22,965 ft. (7 000 m); maximum range, 410 mls. (660 km); initial climb rate at 5,400 lb. (2 450 kg), 3,280 ft./min. (17,83 m/sec); time to 3,280 ft. (1 000 m), 1·1 min., to 9,840 ft. (3 000 m), 3·6 min., to 19,685 ft. (6 000 m), 7·75 min.; service ceiling, 34,450 ft. (10 500 m).

Weights: Empty, 4,189 lb. (1 900 kg); empty equipped, 4,685 lb. (2 125 kg); loaded, 5,875 lb. (2 665 kg).

Dimensions: Span, 32 ft. 4½ in. (9,87 m); length, 28 ft. 4½ in. (8,64 m); height, 8 ft. 2⅓ in. (2,50 m); wing area, 174.053 sq. ft. (16,17 m²).

Armament: Two 20-mm (Oerlikon) MG FF cannon with 60 r.p.g. in wings and two fuselage-mounted 7,9-mm Rheinmetall Borsig MG 17 machine guns with 1,000 r.p.g. (or 500 r.p.g. if MG FF/M installed). One engine-mounted 20-mm MG FF/M cannon with 200 rounds mounted by some aircraft.

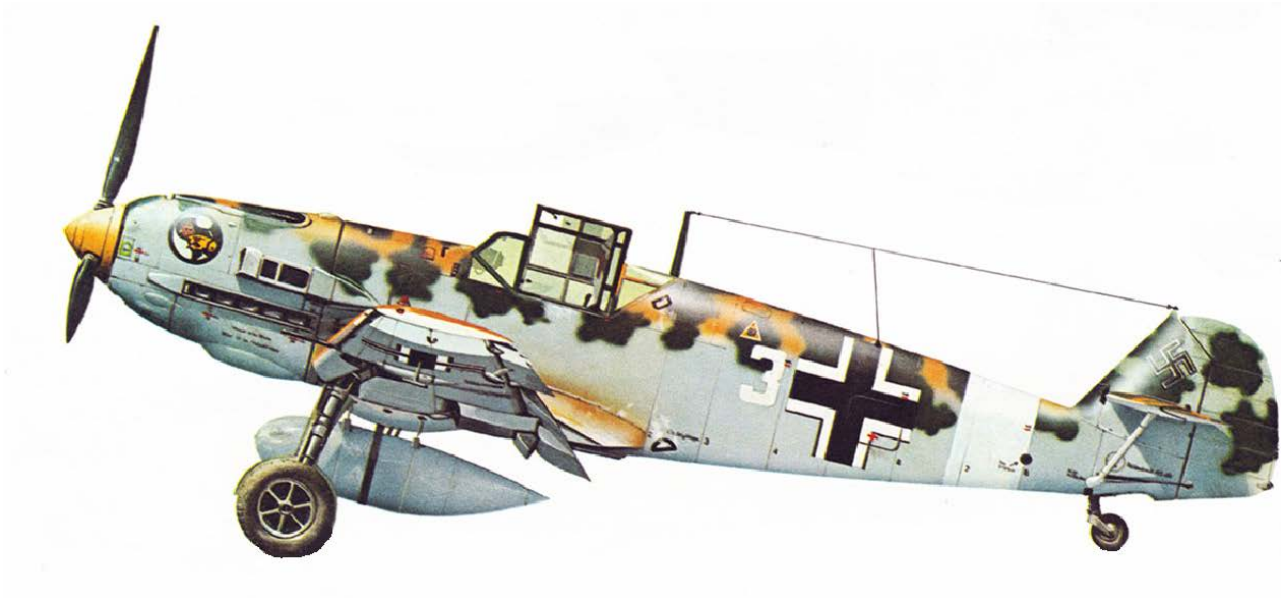

Figure 9 - *Bf109E-7. A late arrival to the Battle of Britain, seen here as a tropicalized variant wearing desert camo. Clearly illustrated though is the belly mounted 300 l / 68 gal drop tank. Alternately a 250kg/550lb bomb load could be substituted when operating in a fighter bomber role.*

Shortly after 15 September, British Intelligence interception of German radio traffic revealed the indefinite postponement of operation *Sea Lion*. The Battle of Britain would continue until the end of October 1940, although in a somewhat different format. Large numbers of Bf 109s, including the E-7 fighter bomber, flying at altitudes of up to 32,000 ft / 9,750 m, entered British airspace, often dropping their bombs at random. In actual terms of damage caused to the war economy, these raids were mainly of nuisance value. The air combats were anything but, with the 109 pilots holding height and speed advantages, as the RAF figters clawed their way up to altitude to engage. Approximately 180 RAF pilots were lost during the month, either killed, wounded or missing.

Officially the Battle of Britain concuded on 31 October 1940 with neither side suffering outright defeat. Vitally, the RAF had stayed off the prospect of the invasion of Britain.

AFTERMATH

Willy Messerschmitt continued designing aircraft throughout the war. Arguably, the best known of these was the Me 262, the world's first operational jet fighter although only seeing limited service. The Bf 109 remained a frontline fighter undergoing various modifications until Germany's collapse in May 1945, the final series being the Bf 109K.

Following Germany's surrender, the western allies and Russia began scouring the country for scientists and engineers who had been at the forefront of German weapon development. Many of them, including Willy Messerschmitt, were flown to London and interrogated by British and American aviation experts. In 1948, a "de-nazification" court convicted him of collusion with the Nazi party, in that he had used slave labour in his factories, and sentenced him to two years gaol. He was, though, not deemed to be a war criminal.

Evidence used against him included:

- Membership of the NSDAP (Nazi party) since 1933;
- A supporting member of the SS, a vast political/military organisation serving the state;
- Correspondence from the NSFK (National Socialists Flyers Corps) addressing him as *Brigadefuhrer* Prof Messerschmitt, normally used as an SS rank.

Willy Messerschmitt happened to be in a place, Germany, at a time in 1933 and in a industry, aviation, where nationalism was being fired up by Hitler, the Nazi party leader. Considering the end goal of Nazism and the forecast role aviation would play, it is not surprising that a young, aspiring Messerschmitt saw party membership as advantageous to his career.

Returning to a ravaged Germany in 1948, Willy Messerschmitt restored his Augsburg factory and began manufacturing various items, from sewing machines to prefabricated houses and a small three wheeled cabin scooter (*Kabinenroller*). In 1951, Willy and his future wife Lilly moved to Spain, where he was employed as a consultant to *Hispano-Aviacion*. The company was engaged in modifying Bf 109 airframes of the Spanish Air Force, including the installation of Rolls Royce Merlin engines. These aircraft served until their de-commissioning in 1967, when almost 30 were purchased to appear in the classic film "The Battle of Britain". In 1952, he married his long time partner, Baroness Lilly von Michel-Raulino Stromeyer. A wealthy business woman, herself, she had provided Messerschmitt with both financial assistance and business guidance over many years.

Messerschmitt then designed two piston engine military trainers, the HA-100E and the HA-100F. Due to the difficulty in obtaining parts, only one proto-type of each aircraft was built. His next venture for the Spanish Air Force proved to be more successful. This was the HA-200, a twin jet, advanced military trainer/light attack aircraft. Over 200 were delivered, including 90 built under licence in Egypt. Messerschmitt then began designing a Mach 1.7 / 3,000km/h single engine jet fighter for *Hispano*, the HA-300. Due primarily to cost overruns, Spain withdrew from the project, which was then sold to Egypt. Messerschmitt and his team were also contracted by the Egyptian government in late 1959 to continue further development of the fighter. Unfortunately, this proved to be a slow and costly process, not helped by Egypt's underdeveloped industrial base. Only three prototypes were completed, with the first HA 300 not flying until March 1964 and the second prototype delayed to July 1965. Two more years were to go by before the project was closed down, forced by the Six Day War and Egypt re-equiping with Soviet supplied jet aircraft. With turmoil facing Egypt, Willy Messerschmitt returned to Germany.

Restrictions placed on Germany saw aircraft manufacturing banned until the mid-1950s. Messerschmitt AG, in consortium with Heinkel, began assembling, under licence, the French Fouga "Magister" jet trainer in 1960 for the post WWII Luftwaffe. Further involvement with Heinkel, Dornier, Siebel and Messerschmitt saw the production, under licence, of the Italian Fiat G.91 fighter bomber and the Lockheed L-104 Starfighter.

In 1963, Messerschmitt put forward two new proposed aircraft designs, the first being a small 5-6 seat passenger twin jet. The second was a feeder airliner powered by three rear mounted jet engines, able to carry up to 58 passengers, to replace Lufthansa Convair Metropolitans. Neither aircraft proceeded beyond display model stage. Willy Messerschmitt's last foray into aircraft design, the "Bush Transporter", was proposed for use in third world countries. The fuselage was to be of box shape with hinged nose doors, similar to his 1941 Me 323 "Gigant" transport aircraft, and powered by two turbo prop engines. Once again, the aircraft did not advance beyond the planning stage.

By mid-1969, Messerschmitt had merged with Bolkow and Blohm, both firms with aviation backgrounds, the new entity becoming MBB. Messershmitt was appointed as chairman until his retirement in 1973, thereafter becoming

Honorary Chairman until his death. Baroness Lilly von Michel-Raulino, Messerschmitt's wife, passed away on Christmas Day 1973. With their relationship beginnining in the mid 1920s, Lilly provided Messerschmitt with a loving marriage that, due to her own wealthy background and extensive business experience, proved to be most beneficial. He greatly felt her loss. Willy Messerschmitt survived his wife by five years, ironically dying on 15 September 1978, the date that celebrated Battle of Britain day, and a date on which his Bf 109 will forever be remembered

Figure 10 *- Lilly and Willy Messerschmitt in their latter years. Taken in July 1965, the image shows Willy Messerschmitt wearing the "Golden Windrose" neck chain awarded to him for his pioneering work in aviation.*

Willy Messerschmitt, who founded his first company, *Flugzeugbau Messerschmitt Bamberg*, in 1924 to build powered gliders, had come a long way. He had proved to be one of aviation's pioneers, with a career ranging from the design and building of gliders to jet aircraft. The fact that his best known aircraft, the Bf 109, was created to serve a nation at war, should not detract from his lifelong dedication to aviation in both its military and civilian spheres.

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