

**AIRCAM AVIATION SERIES**

**№ S6**  
VOLUME 1

# **LUFTWAFFE**

## **COLOUR SCHEMES AND MARKINGS 1935-45**





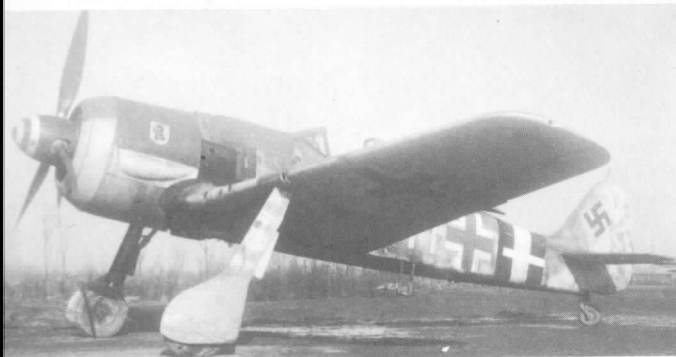
Above: A rare view of an Fw 190A of Jagdgeschwader 51 in Russia during the summer of 1942, displaying splinter camouflage down to the wing-roots—never seen on Focke-Wulfs in the West—and Geschwader and I Gruppe badges. The pilot is the Gruppenkommandeur, Hptm. Heinrich "Gaudi" Krafft, who baled out and was beaten to death by Russian troops on 14th December 1942. (U.S. National Archives).



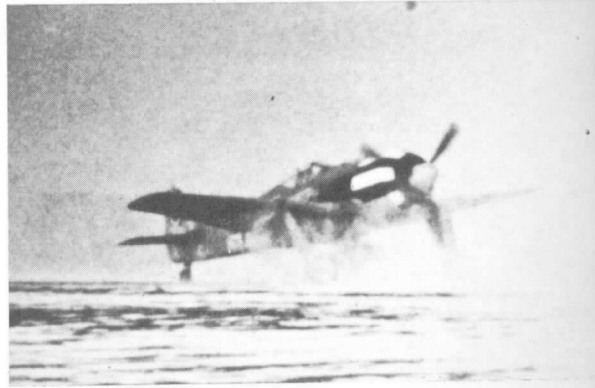
Above: Standard camouflage on an Fw 190A; note the extended flash of black paint over the exhaust area, peculiar to this type of fighter. (U.S. National Archives).



Above: The snake badge used first by 3./JG 3 and later by 6./JG 1, on the nose of an Fw 190A. (U.S. National Archives).



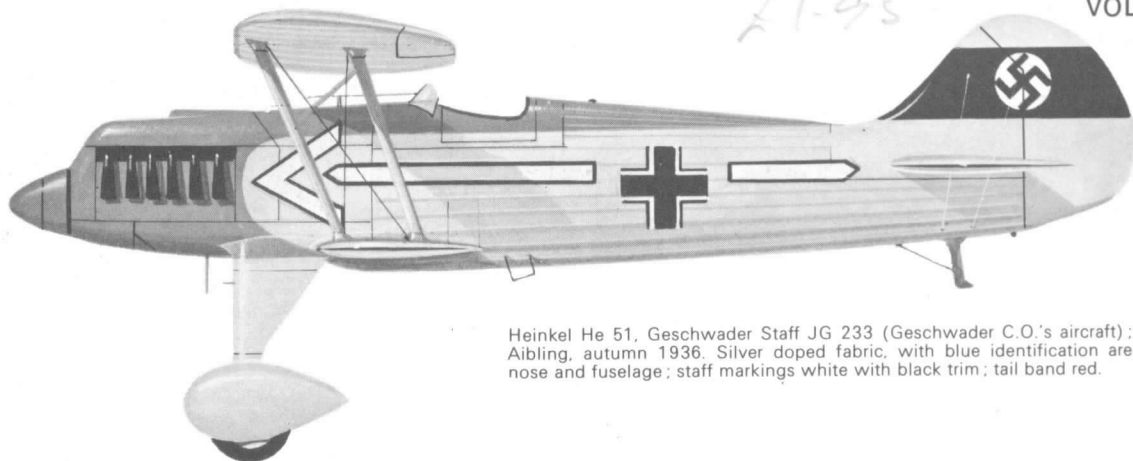
Above left: A Focke-Wulf Fw 190A-8 of the "Sturmstaffel" of JG 4—note the Home Defence identification bands around the rear fuselage, the spiral-painted spinner and the mottling of grey or green on the pale blue vertical tail surfaces. (Selinger).



Above, right: Another late-war colour scheme—a Focke-Wulf of either JG 1 or JG 300 with black and white striped cowling decoration. (Obert).

Below: Interesting effect on the wing leading edge of an otherwise conventionally camouflaged Fw 190A-3. (U.S. National Archives).





Heinkel He 51, Geschwader Staff JG 233 (Geschwader C.O.'s aircraft); Bad Aibling, autumn 1936. Silver doped fabric, with blue identification area on nose and fuselage; staff markings white with black trim; tail band red.

# LUFTWAFFE

## COLOUR SCHEMES AND MARKINGS 1935-45

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**Text by Martin Windrow**

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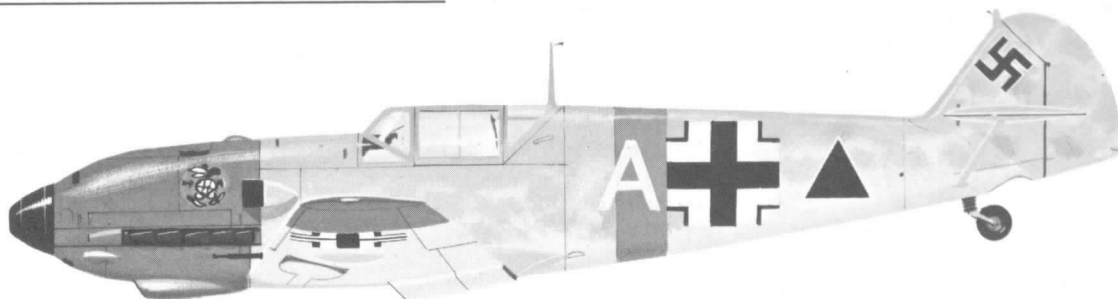
**Illustrated by Richard Ward**

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### ACKNOWLEDGEMENTS

The author and illustrator wish to acknowledge frequent references to the published researches of Herr Karl Reis Jr., Gruppe 66, and J. Richard Smith, Esq., during the preparation of this text and illustrations.

This book on the Camouflage and Markings of the Luftwaffe during the years 1935 to 1945 is the first in a series of similar books within the AIRCAM SERIES. The second title will be the Regia Aeronautica and the Aviazione della Repubblica Sociale Italiana covering the period 1923 to 1944.



Messerschmitt Bf 109E-4(B), 5./Sch.G 1; Chir area, Russia, autumn 1942. Grey fuselage and upper wings, mottled with pale blue low on fuselage sides. Yellow cowlings, belly-band and under-wingtips; black spinner and triangle, white "A" and triangle trim. See colour insert page for insignia details.

*Published by: Osprey Publishing Limited, England*

12-14 Long Acre  
London WC2

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First published March 1971

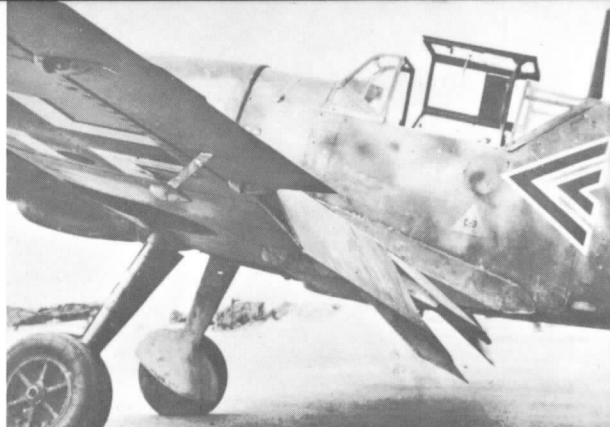
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Third impression in 1976

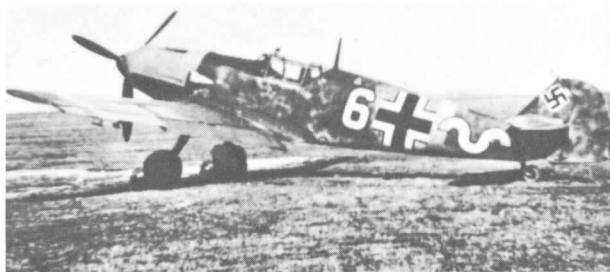




Above: Nose-over by a JG 1 Messerschmitt Bf 109E-4 in Holland, 1941. The colour and marking conventions are unremarkable for the period; but note the over-painted cowlings, wing-tips, fin and rudder. (Obert).



Above: A looser convention came in during 1941, with the advent of the officially authorised mottled scheme. Note the Gruppenkommandeur's double chevron replacing the individual aircraft number behind the cockpit, and the fuel octane stencil on a yellow triangle. (I.W.M.).



Above: Compare the loose mottling of 1941 with the "unofficial" unit-level paint job on this Bf 109E-3 of 7./JG 52 in France during 1940. Number and Gruppe symbol are conventional, but note the yellow cowlings and—remarkable at this early date—narrow yellow belly-band, both presumably applied as extra III Gruppe identification aids. (Joos).

Left: Dated victory bars on the tail of a Bf 109E—the direction of the arrows presumably differentiates victories in the air from aircraft destroyed on the ground. Note also the Werke Nummer. (Obert).

Below: Pilots of 6./JG 53 "Pik As" run to their Bf 109Gs on an airstrip in Sicily, early in 1943. Note the faded green and sand-yellow mottled camouflage along the top of the fuselages, the white belly-bands, and the unit badge. (U.S. National Archives).







A pair of Focke-Wulf Fw 190A-3's of 1./JG 26 on a Channel airfield, see side-view colour illustration C5 for colour details. (US Nat. Arch.)

## LUFTWAFFE Colour Schemes & Markings 1935-45

### Introduction

The most frequently encountered German words in the following pages will be Geschwader, Gruppe, and Staffel—the basic tactical units of the Luftwaffe. The Geschwader, very roughly corresponding to the British “Wing”, was prefixed by a term indicating its function: e.g., Jagdgeschwader, abbreviated to JG, may be translated as “Fighter Wing”. A list of the most common abbreviations is given below.

Each Geschwader was divided into a Staff flight and three or more Gruppen; each Gruppe was divided into a Staff flight and three or more Staffeln. The strengths of these sub-units varied widely, according to branch of service, and depending on the supply and replacement rate of machines and pilots in any given instance. Very generally it may be said that the Staffel usually mustered between twelve and sixteen aircraft, giving the Gruppe an establishment of 40 to 50 aircraft, and the Geschwader, 100 to 120 aircraft.

Within the Geschwader the Gruppen were identified by Roman numeral prefixes to the Geschwader designation and number—e.g. I/JG 27, II/KG 40. The Staffeln were numbered consecutively right through the Geschwader, and identified by Arabic numerals: e.g. Gruppe I/JG 27 comprised Staffeln 1./JG 27, 2./JG 27, and 3./JG 27, while Gruppe II/KG 76 comprised Staffeln 4./KG 76, 5./KG 76, and 6./KG 76.

The most common Geschwader and Gruppe prefixes and abbreviations as follows:

Erprobungsgruppe (experimental Gruppe)	..	E.Gr.
Ergänzungsgruppe (replacement training Gruppe)	..	Erg.Gr.
Fernaufklärungsstaffel (long range reconnaissance)	..	Staffel no. (F)/Gruppe no.
Heeresaufklärungsstaffel (local reconnaissance)	..	Staffel no. (H)/Gruppe no.
Jagdgeschwader (single engine fighter Geschwader)	..	JG
Küsten Flieger Gruppe (coastal Gruppe)	..	K.Fl.Gr.
Kampfgeschwader, Kampfgruppe (bomber Geschwader, Gruppe)	..	KG, KG.Gr.
Lehrgeschwader (operational training Geschwader)	..	LG
Nachtjagdgeschwader (night fighter Geschwader)	..	NJG
Nachtschlachtgeschwader (night ground attack Geschwader)	..	NSG
Schlachtgeschwader (ground attack Geschwader)	..	initially Sch.G, later SG
Schnelles Kampfgeschwader (fast bomber Geschwader)	..	SKG
Stukageschwader (dive bomber Geschwader)	..	St.G

Transportgeschwader (transport Geschwader) .. TG\*  
 Zerstörergeschwader (heavy fighter Geschwader) .. ZG  
 \*Luftwaffe transport units were, until 1943, generally termed as “Bomber Wing on special detachment”, abbreviated to KGzbV.

### SINGLE ENGINE FIGHTER UNITS

When the existence of the German Luftwaffe was formally announced to the world in March 1935, the fighter force which had been built up in secret over a number of years consisted of Heinkel He 51 and Arado Ar 64 and Ar 65 single-seat single engine biplanes. In common with most fabric-covered biplanes the world over, these aircraft were delivered in an overall paint scheme of silver dope. Prior to March 1935 they carried normal civil registration letters on wing and fuselage surfaces.

With the emergence of the military air arm, these civil markings were replaced by national insignia, and by a five character code painted in black on the fuselage sides and wing upper and lower surfaces as a unit identification measure. The national insignia comprised the Balkenkreuz, or Greek Cross, a narrow black cross of symmetrical shape, the sides of the arms outlined in white, with a thin black trim line outside the white. This appeared on the upper surface of each upper wing tip, the lower surface of each lower wing tip, and midway along each side of the fuselage. In addition, a broad red band was painted horizontally across the vertical tail surfaces; centrally, on each side, this bore a large white disc, set in which was the National Socialist emblem—a tilted black Hakenkreuz, or swastika.

The five character code was determined according to a rather complex formula, as follows. The Luftwaffe was at this time regionally organised, its strength divided between six Luftkreiskommandos, or Local Air Commands; and the first code character indicated the Luftkreis:

Luftkreiskommando I	Königsberg
.. II	Berlin
.. III	Dresden
.. IV	Münster
.. V	München
.. VI	Kiel

The second character indicated the chronological order in which the various Geschwader had been formed within each

Luftkreis, and was followed by the Balkenkreuz. The third character was the code letter of the individual aircraft within the Staffel. The fourth indicated the Gruppe, and the fifth, the Staffel. Thus, a Heinkel He 51 of JG 132 "Richthofen" might carry the code 21 + A25:

2 = Luftkreis II, Berlin  
1 = JG 132, the first Geschwader formed in Luftkreis II  
+  
A = Individual aircraft letter  
2 = II Gruppe, JG 132  
5 = 5 Staffel, JG 132

As a further identification procedure, the aircraft of various fighter units were decorated during 1935 with areas of colour. These usually comprised the entire engine cowling, sweeping up and back along the spine of the fuselage to the tail; in some cases broad bands of colour were also painted around the "small" of the rear fuselage. Examples were:

JG 131, based at Jesau	..	..	..	..	Black
JG 132, based at Döberitz	..	..	..	..	Red
JG 134, based at Dortmund	..	..	..	..	Brown
JG 232, based at Bernburg	..	..	..	..	Green
JG 233, based at Bad Aibling	..	..	..	..	Blue
JG 234, based at Cologne	..	..	..	..	Orange

Some units were awarded "honour titles", a practice which was to continue throughout the life of the Luftwaffe; and in some cases the choice of identity colour was not entirely random. As stated above, JG 132 continued the traditions of the famous First World War unit, Jagdgeschwader Nr.1 "Richthofen"; and the unit's Heinkel fighters were decorated with red, the traditional colour of the "Red Baron" and his pilots of twenty years before. JG 134 was named "Horst Wessel", after the Nazi Party's gutter-poet hero, and was distinguished by brown, the colour of the early Nazi and storm trooper uniforms. Bernburg is believed to have had a traditional connection with hunting and field sports, and the local fighter unit decorated its aircraft in green; and so forth.

As may be supposed, the extremely unwieldy identification system described above quickly proved unsatisfactory. The five character codes on the fuselages of small biplanes could only be distinguishable at short distances, and involved such a degree of prior knowledge and mental arithmetic that in the air it would probably have been easier to shout at the pilot and ask his name! Accordingly, on July 2nd 1936 the directive LA Nr.1290/36 geh. LA II/FI.In.3 was issued, which laid down that the traditional Geschwader colours were to be retained, but that a much simpler system of markings would replace the five character codes.

In future, each aircraft of a Staffel was to carry a number between one and twelve painted in white with a black outline on each side of the nose and on the upper and lower wing centre-sections. The Staffel within the Gruppe would be indicated by an additional marking on the coloured areas. Staffeln 1, 4 and 7 of each Geschwader bore no marking; Staffeln 2, 5 and 8 carried a white band painted round the cowling and superimposed on the broad coloured band round the rear fuselage; and Staffeln 3, 6 and 9 had a white disc on the side of the cowling and on the rear fuselage band. Staffeln commanders were to fly aircraft number 1, but were not

otherwise identified.

The Gruppe within the Geschwader was indicated by a symbol painted on the fuselage side between the aircraft number and the Balkenkreuz, as follows: I Gruppe, no marking; II Gruppe, a horizontal bar; and III Gruppe, a horizontal wavy line.

The various officers of the Geschwader and Gruppe Staff flights carried, in place of aircraft numbers, combinations of chevrons and bars, in white with black outline, on the sides and upper and lower wing surfaces of their aircraft. A typical fighter of this period is illustrated on the title page.

## The Introduction of Camouflage

The colouring of German fighters between mid-1937 and the spring of 1940 has been variously described; from a comparison of published information and photographs it may safely be stated that several distinct schemes were used, and that central control over colour schemes and markings was weak and badly co-ordinated.

The most common schemes used on the new monoplane fighters which were coming into service in 1937 and 1938 included a coat of light grey dope over all upper and side surfaces, the undersides being painted pale blue. Early in 1938 the German Air Ministry—Reichsluftfahrtministerium, or RLM—directed that the upper and side surfaces should be repainted in camouflage shade No. 70, a very dark matt green known as *schwarzgrün*—literally, "black-green". The under-surfaces remained in pale blue.

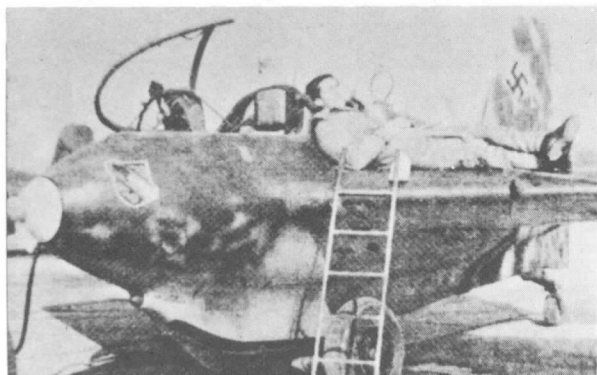
The same period saw another change in the system of markings, the last major change which was to take place for the rest of the life of the Luftwaffe. The Staffeln within the Gruppe were given identifying colours (the old Geschwader colours were abandoned); the first Staffel in each Gruppe was identified by white; the second by red; and the third by yellow. (During the early stages of the war in Europe, black was occasionally used instead of red as the second Staffel colour). These colours appeared in the individual aircraft numbers, which moved to a position immediately ahead of the Balkenkreuz on each side of the fuselage. As in every area of German aircraft markings, there were exceptions to this general rule; I/JG 1, for instance, persisted in carrying the number of the aircraft on the sides of the engine cowling throughout 1939. Photographs exist which show early Messerschmitt fighters with the numbers marked in small characters above or below the Gruppe symbol on the rear fuselage; and in mid-1941, some Bf 109Es in Russia still carried the numbers on the sides of the engine cowling.

Behind the Balkenkreuz, on both sides of the fuselage, appeared a symbol which identified the Gruppen within the Geschwader. Aircraft of I Gruppe bore no symbol; aircraft of II Gruppe, a horizontal bar; and III Gruppe, a wavy horizontal line. This last was officially replaced by a vertical bar symbol in 1941; but again, photographs show the old wavy line in use as late as the winter of 1944/45 in some units. In the few instances where a fighter Geschwader mustered four Gruppen, the fourth was identified by either a small cross, or a solid disc.

The old tail insignia disappeared at this time; obviously the red band was too conspicuous in the field, and late in 1938 it

Right: Me 262A-1a of JG7—note the vaguely conventional splinter camouflage on the top part of the fuselage fading off into a heavy dapple of both colours low on the sides.

Left: Dappled Me 163 rocket fighter of 2./JG 400. (Heise).



was replaced by a simple black swastika trimmed in white, painted directly onto the ground colour of the tail.

Some time during 1938, certainly before October of that year, some fighters began to appear with the black-green partially overpainted with camouflage shade Nr. 71—*dunkelgrün*, or dark green—see view A2. A slightly lighter shade than *schwarzgrün*, this was applied in large, angular, straight-edged patches to give the characteristic “splinter” camouflage pattern, over all upper and side surfaces. How many units employed the scheme at this early date is not known; the overall black-green certainly predominated until late in 1939. Some interesting compromises between the two schemes have been observed, including a splinter of dark green with “RLM grey”, seen on some machines of JG 53 in the winter of 1938 and illustrated as colour view A3. This “RLM grey” was a greenish grey shade widely used in the Luftwaffe for painting interior surfaces such as cockpits, wheel-wells, bomb-bays, etc.

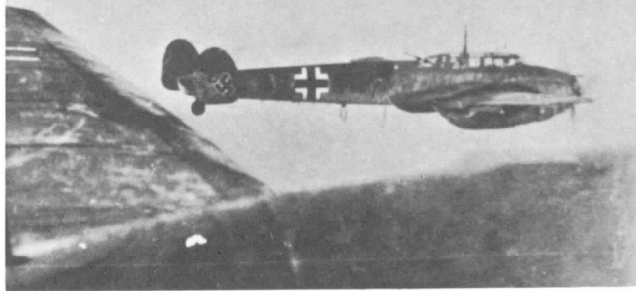
### The Condor Legion

Late in 1936 Germany began sending increasingly large amounts of military aid to the Spanish Nationalist forces of the rebel General Francisco Franco y Bahamonde, who was engaged in an attempt to overthrow the Republican Government. The world quickly came to see this civil war as the first major clash between the Right and the Left, Fascism and Communism. The fascist powers, Italy and Germany, poured arms and advisors, and later fighting men, into Spain to aid Franco; while Soviet Russia backed the left-wing Republican Government, as did many volunteers from Europe and America, whose hatred of fascism led them into the International Brigades.

The first aircraft sent by Germany were twenty Junkers Ju 52/3m transport/bomber machines escorted by six He 51 fighters; and by May 1937 the figure had grown to 200 machines of all types, forming an autonomous air force known as the *Legion Condor*. The fighter component of this force was designated Jagdgruppe 88, or J.88, and consisted of four Staffeln of He 51s. Beginning in March 1937, the new Messerschmitt Bf 109B monoplane started to appear in Spain, and from then on the process of replacement by progressively newer models of the Bf 109 was constant. By the time hostilities ended in 1939 the first Bf 109E-1 fighters had arrived, but some of the old He 51s were still in use as ground attack aircraft.

The colour schemes adopted by the fighters of J.88 varied. Some of the He 51s were painted in the overall pale grey scheme, with pale blue undersides. Some were delivered in this colour, but were partially overpainted with dark green and brown in an imitation of the standard Luftwaffe bomber scheme of that period—an angular segment pattern of the three colours. Some were painted RLM grey over all upper and side surfaces, with pale blue bellies. The aircraft became distinctly weathered after a few months campaigning in the meteorological extremes of the Spanish climate, and were touched up with whatever paint came to hand. A rather weathered example of a Heinkel He 51 in the “segment” scheme is illustrated in colour on the front cover.

As far as is known, all the Messerschmitts sent to Spain retained their pale grey finish, although isolated examples of RLM grey machines have been quoted. The national insignia carried by the Bf 109s was also more standardised than that of the He 51s. The biplanes had a variety of markings on the upper and lower wing surfaces. Most carried the Nationalists’ white St. Andrew’s cross painted to the full chord of the wing, directly onto the ground colour, near the tips. White wing tips were usual, and one or more black or white chordwise bands were not uncommon; large white discs were also occasionally painted inboard of the cross on the upper wing. No explanation of the exact significance of these is currently available. The Bf 109s, on the other hand, carried the white cross on a black disc above and below each wingtip, and additional wing markings do not seem to have been applied. The entire rudders of all Legion aircraft were painted white, with a black St. Andrew’s cross superimposed. On the fuselage sides, in a central position, was painted a black disc. Photographs of aircraft with a small white St. Andrew’s cross painted on this disc are believed to show machines left behind for the use of the Spanish Air Army after the end of the civil war and the



Splinter camouflage is confined to the wings and fuselage spine of this Bf 110C reconnaissance fighter of 4. (F)/14, the remainder of the sides and tail being covered in a tight dapple. (U.S. National Archives).

withdrawal of the Condor Legion. On each side of the disc were painted black code numbers. Each foreign aircraft type used in Spain was allotted a type number, and this appeared to the left of the fuselage disc; that for the He 51 was “2”, and that for the Bf 109 was “6”. The number of the individual aircraft was painted to the right of the disc; this had no unit significance, being simply the number of the aircraft within its type series. A typical Messerschmitt is shown in the colour pages as view A1.

Additional insignia were occasionally marked on the black fuselage disc, both of personal and unit derivation. The aircraft of Gotthard Handrick, Staffelfkapitän of 2./J.88, bore a stylised white “H” in this position; his aircraft was numbered “6.56”. The Spanish Civil War saw the widespread use of Staffel badges for the first time, and these were sometimes marked on the fuselage disc, sometimes under the cockpit—see front cover and view A1. The insignia of 1./J.88 was a diving raven; of 2./J.88, a top hat; of 3./J.88, a Mickey Mouse figure; and of 4./J.88, an ace of spades. All were to survive, either as personal or unit badges, well into the Second World War.

### The Second World War

In September 1939 Nazi Germany invaded Poland and precipitated the Second World War. The invading armies were covered by Messerschmitt Bf 109E fighters, the vast majority, if not all of which were painted *schwarzgrün* over all upper and side surfaces, with pale blue bellies. Some retained the original narrow style of Balkenkreuz on wing and fuselage surfaces, while others were apparently already marked with the new, squatter style which was to remain standard for much of the rest of the war. The fighters carried the new style of individual numbers painted in the Staffel colour, with Gruppe identification symbols to match. Spinners were often painted or striped in the Staffel colour. The Jagdgeschwader were going through a process of re-organisation and re-numbering at this time; and the Geschwader, Gruppe and Staffel badges which were to become well known throughout the war were beginning to appear on fighters more and more frequently. In the shadow of world war, a sense of identity among the men and squadrons of the fledgling Luftwaffe was essential to morale, and as a quick way of cementing *esprit de corps* these badges were encouraged at high level.

For reasons of space, it has not proved possible to include in this *AIRCAM SPECIAL* a comprehensive colour guide to the unit insignia used by the Luftwaffe during the war years. One of the colour pages in Volume two illustrates insignia marked on aircraft featured in colour in both Volumes. In later books in this series it is intended to provide colour sheets illustrating all known insignia.

Immediately following the close of the Polish campaign, the

The white belly-band typical of the Mediterranean theatre was not always the same width: this wide style backing the last two characters of the fuselage code was not uncommon. This is a Bf 110 of 7./ZG 26. (U.S. National Archives).





overall *schwarzgrün* fighter scheme was replaced by the splinter of two shades of green previously described. Most of the fighters which took part in the occupation of Denmark and Norway in the spring of 1940 were finished in this way. Those formations now poised on Germany's western borders, popularly known as the *Sitzkreiger*, were painted at this stage in a characteristic scheme which was to become standard for all fighters involved in the campaigns over France, the Low Countries and Great Britain during 1940—standard, that is, until they fell into the imaginative hands of various squadron equipment officers. The splinter scheme was retained on wing and tail upper surfaces and on the spine of the fuselage, down to a point level with, or slightly higher than, the bottom line of the cockpit of the Bf 109E. Below this line the fuselage sides, the entire vertical tail surfaces, and of course the belly, were painted in pale blue. This met the splinter in a hard, straight line; see the example illustrated as view A4.

During the Battle of Britain this clean and attractive colour scheme was the most widely observed; but even in August 1940 individual units were starting to vary the appearance of their aircraft, both for reasons of concealment and through the simple and sturdy dislike of the front-line soldier for niggling and minutely detailed instructions emanating from distant administrators. Although the exact dimensions and relationships of the areas of colour in the splinter scheme were laid down by the factory in consultation with RLM, and charts issued to units, the fighters which were brought in for repair and repainting were often sprayed in accordance with the whim of the maintenance officer, pilot or junior commander, rather than the mandate of RLM. In direct contrast to the Royal Air Force, the Luftwaffe was to become less and less rigid in the application of centrally contrived camouflage patterns.

One of the first examples of this straying from the "authorised version" was the scheme applied to Bf 109Es of III/JG 2 "Richtofen". The pale blue sides and vertical tail surfaces were covered with a tight stipple of both shades of green applied with a stiff brush; this pattern is illustrated as view A5. A less common variation was the painting of the whole fuselage, and in some cases the wing and tail upper surfaces as well, in a dense mottle of dark green, dark grey, and/or RLM grey; one of the few authenticated examples of this practice is displayed by the Bf 109E-4 of 6./JG 51 shot down by P/O B. J. Wicks of No. 56 Sqn., R.A.F., on August 24th 1940, and illustrated as colour view A6.

Other marking practices which were observed during the Battle of Britain included the more elaborate decoration of propeller spinners, the temporary use of coloured areas for tactical purposes, and the marking of victory tallies. The spinners of fighters were frequently halved, quartered, or striped in a combination of the Gruppe and Staffel colours, the Staffel colour usually taking pride of place; e.g., an aircraft of 8./JG 51 might have the spinner painted red—for the second Staffel of the Gruppe—with a quarter segment of yellow—for the third Gruppe of the Geschwader. A horizontal division—i.e. in the plane of the aircrew shaft—of black and white was quite common, irrespective of unit; and

machines of Staff flights almost invariably featured some use of green on the spinner, either in combination with a unit colour or with white.

For quick recognition during specific operations—the most common being close escort, involving rendezvous over the Channel with trigger-happy bomber crews—fighters were sometimes painted with large areas of solid colour on the nose, wing tips or tail. Water-soluble white, red or yellow paints were used, and a completely overpainted engine cowling was the most usual style.

The marking of some sort of visible tally of aerial victories on a successful pilot's aircraft had first been noted during J.88's operations in Spain, and the same practice was continued, with very little variation, on all fronts during the Second World War. Small vertical bars, each representing a victory, were painted on the vertical tail surfaces in rows. On pale backgrounds the bars would usually be in black or red; on darker grounds, in white or yellow. During 1939 and 1940 these bars were occasionally marked on the fin below the swastika, but the great majority of examples show the tally painted on the rudder. Often each bar would be marked with a small representation of the national insignia of the aircraft destroyed, and the date of the victory. As the war progressed, and the number of "Oberkanone" increased, the practice became for an ace pilot to paint out the bars showing previous victories when he received the Knight's Cross or one of its higher grades. A design representing the medal itself would be painted on the tail in their place, and the bars would be started again "from scratch". A number showing the previous total would be incorporated somewhere in the design; the exact form of these designs was entirely up to the individual pilot, and some were extremely colourful and attractive, involving miniature Knight's Crosses, Oakleaves, Crossed Swords, eagles and lightning flashes.

One of the most vexed questions in the research which has been carried out in recent years has been the exact significance of the chevron/bar combination symbols marked ahead of the fuselage Balkenkreuz, in place of an individual number, on the aircraft of members of Geschwader and Gruppe Staff flights. These were usually in black with a thin white trim; on dark grounds they sometimes appeared in white, with or without black trim, and colour view A4 illustrates an aircraft on which an open black outline style was used on a pale blue background. The Gruppe symbols appearing behind the Balkenkreuz on such aircraft were almost invariably painted in the same style as the Staff symbols.

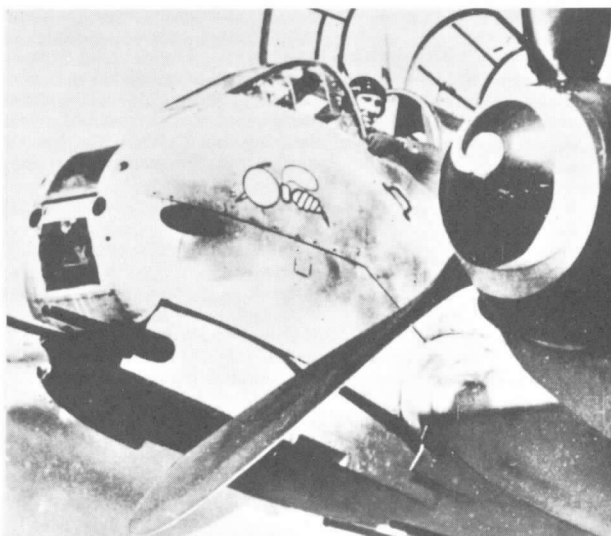
A selection of these markings is illustrated in the accompanying colour drawings; but it must be emphasised that the variations from unit to unit were fairly wide. In particular, the marking of the Geschwader *Kommodore* (the C.O. of the entire Geschwader) was prone to variations according to the taste of the pilot.

### The Mid-War Years: Africa and Russia

In 1941 the Luftwaffe's Fighter Arm was committed to battle on new fronts, and new colour schemes, some of them geographically oriented, began to appear.

Right: The late presentation of the famous "Wasp" badge of ZG 1 on the nose of an Me 410 fitted with extra cannon in the bomb bay and a belly gondola for bomber interception duty.

Below: White outline national insignia on the fuselage, tiny characters for the unit code, and a messy dappling of RLM-grey over the side surfaces are all typical of twin-engined aircraft in 1944 and 1945. This Me 410 was captured in Italy—note the painted-over white belly-band. (I.W.M.).



The fighters of the two Jagdgeschwader which remained on the Channel Coast, the élite JG 2 "Richthofen" and JG 26 "Schlageter", adopted a new scheme early in the year. The basic splinter scheme of *schwarzgrün* and *dunkelgrün* was retained on wing and tail upper surfaces and on the spine of the fuselage; however, the patterns became less rigid, and the angles and edges were not always straight, but more and more frequently curved or oversprayed to produce a vague, soft division. The lower limit of the splinter scheme on the fuselage ceased to be a hard line and was also oversprayed to give a soft, wavy merging into the pale blue fuselage sides. These side surfaces, and the vertical tail surfaces, were then mottled with soft-edged sprayed patches of RLM grey, or of a combination of both shades of green. This combination of splinter upper surfaces, mottled sides and pale blue belly was to remain the standard European and Russian summer scheme for the rest of the war; variations were in shade and degree rather than in fundamental pattern. An early example is illustrated as view B1; note that the spine camouflage is still "hard-edged".

The Bf 109Es of JG 77 which saw action in the Balkans and Greece in 1941 were painted according to this concept of camouflage, and were additionally marked with large areas of yellow, as an identification measure for the ground troops. The example shown as view B2, with a yellow engine under-tray, is typical. This aircraft is also interesting in that the number and III Gruppe symbol are in black. In some Geschwader a fourth Staffel had been added to one or more Gruppen by this time, and these extra units used black for identification. It is not known for certain whether this aircraft served with 8./JG 77 and was using black in place of red, or with a new "12./JG 77" within III/JG 77.

The Bf 109F "Friedrich" was rapidly replacing the Bf 109E "Emil" in the front line units during 1941, but Bf 109Es were used quite widely both in Russia and in North Africa well into 1942. The most common colour scheme used on the Emilis of JG 27 in the desert comprised pale blue fuselage sides and vertical tail surfaces, with the wing, tail and fuselage upper surfaces sprayed sandy brown. These latter areas were then oversprayed with blotches of dark green, which extended part of the way down the fuselage sides, on the pale blue area. This scheme is illustrated on the Bf 109E-4/N Trop. in colour view B3.

When the Friedrich reached the desert units to begin its famous career with JG 27 and JG 53 "Pik-As" (Ace of Spades), it was supplied straight from the factory finished in sandy brown dope. This usually covered all upper and side surfaces; but photographs show that some machines were delivered with the pale blue undersurface colour meeting the sandy brown in a hard line half way up the fuselage sides. Views B4 and B5 illustrate these schemes—the latter on the aircraft of the "Star of Africa", the young ace Hans-Joachim Marseille.

The practice of further camouflaging the Bf 109F by blotching the upper and side surfaces with dark green does not seem to have become popular until early 1943, when the Luftwaffe was fighting a defensive battle over Tunisia, and later Sicily. It is impossible to be specific about the colour schemes in use in this campaign; it was a time of confusion and retreat and hasty reinforcement from other theatres of war, and fighters were painted with whatever dope came to hand, or delivered from Europe and Russia in their original paint schemes, sometimes hurriedly blotched with green or sand brown. One of the few "orderly" examples of this Mediterranean scheme is shown as view B6.

Aircraft serving in the North African and Mediterranean areas were frequently distinguished by white spinners, the colour often extending back a few inches onto the cowlings; by white wing tips; and, more often than not, by white "belly-bands" round the small of the rear fuselage.

The German invasion of Soviet Russia began in June 1941, and the Bf 109s of the Jagdgeschwader were mainly painted in the splinter-and-mottle scheme which had become standard for day fighters in temperate zones. The density of the mottle on the fuselage varied widely, and there were no hard and fast rules governing the exact method of application or colour combinations. *Schwarzgrün*, *dunkelgrün*, light and dark grey, and RLM grey were all used in various combinations. Sometimes the wing and tail upper surfaces would be



One of the Junkers Ju 87A Stukas which served with the Condor Legion; the camouflage is standard Luftwaffe segment scheme, with Spanish Nationalist markings. The undercarriage spats bear a unit badge, and note the yellow and red striping of the propeller blade tips. (Obert).

finished in splinter, but the fuselage spine in one solid shade only.

The Russian Front produced more interesting examples of non-standard colour schemes than any other campaign in which the Luftwaffe was involved. One unit which seems to have been particularly prone to experimenting was JG 54 "Grünherz", an important and successful formation which was led by the ace Hannes Trautloft. While still operating Bf 109Es in the early stages of the Russian fighting, JG 54 finished some of its machines at least in what might be described as a "snakeskin" or "crazy paving" pattern. Wing and tail upper surfaces remained in a splinter pattern of the two basic greens. The fuselage spine was either in splinter or in solid *schwarzgrün*; the fuselage sides were covered with large, irregular "scales" of dark green or RLM grey, separated by thin channels of the original pale blue and by streaks of *schwarzgrün* branching down from the spine. This pattern, originally applied to Bf 109Es, was retained when JG 54 received the Bf 109F; it is illustrated as view C1.

The obvious step of applying white snow camouflage to aircraft during the fierce Russian winter was widely adopted, and one example is shown in view C2. The standard of appearance naturally varied; paint was sometimes applied carefully, sometimes roughly, leaving areas of the original scheme visible around the markings. The paint used was water-soluble, and naturally weathered rapidly under field conditions; photographs exist showing machines of every possible standard of military smartness, or otherwise!

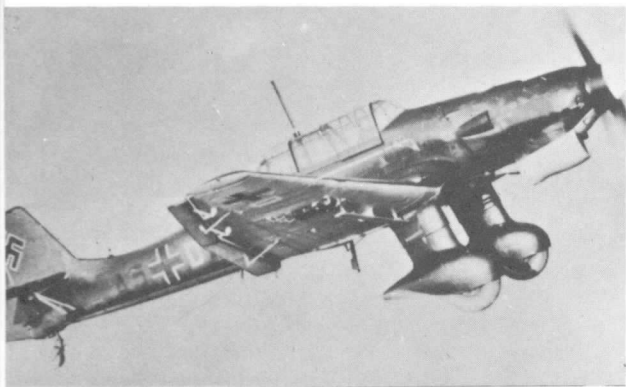
Another temperate zone scheme adopted by the ever-inventive JG 54 was very comparable to British "shadow-shading". The Bf 109F illustrated as view C3 is painted in a wavy-edged pattern of dark green and black-green, extending over all upper and side surfaces; this scheme was also used on the Focke-Wulf 190A fighters with which the unit was re-equipped during 1943.

Luftwaffe units operating in the extreme North, in collaboration with the Finnish Air Force, also produced some imaginative variations on the theme. At one stage Jagdgeschwader 5 "Eismeer" painted some of its basically dark grey Bf 109Fs with a curling pattern of pale blue lines over upper and side surfaces, in a style reminiscent of the "wave-mirror" pattern evolved for maritime bombers and described in the relevant section of this text. For some reason a blotching of dark green on white was not commonly used by the fighter units in Russia, and the Bf 109G of JG 5 illustrated as view C4 is one of the few confirmed examples.

During the summer months the southern areas of the vast Russian landmass enjoy a semi-tropical climate; and aircraft of units such as JG 51 and JG 3 which operated in the South

Henschel Hs 123 ground-attack aircraft in typical pre-war scheme, and the five-character code of Stukageschwader 163 "Immelmann". See the body of the text for an explanation of this code. (Joos)





Above, left: Junkers Ju 87B in the all-over black-green scheme of 1939 and 1940. The unit code "A5" and the diving raven badge visible just under the corner of the windscreen indicate an aircraft of 1 Gruppe, Stukageschwader 1. The white colour of the individual aircraft letter "D" (note unusual inboard position under wing) indicates an aircraft of 1 Staffel. The fourth character must therefore be "H". (U.S. National Archives).

Above, right: Still in action in 1942, the Hs 123 is finished in all-over black-green with the yellow belly-band of the Russian theatre. The unit is 8./Schlachtgeschwader 1; the individual letter "X" is carried aft of the fuselage cross, and the edge of the black and white triangle marking is just visible forward of the cross. (U.S. National Archives).

Below: Sand-painted Stuka over the Mediterranean, 1942; the code is T6+AB, indicating the Staff of 1 Gruppe, Stukageschwader 2. Note the position of the belly-band, and the eagle-and-palm tree marking on the cowlings, in imitation of the German army's Afrika-korps badge. (U.S. National Archives).



Below: Ju 87D in Russia, summer 1943. Note that the aircraft is painted in conventional splinter camouflage all over—unusual for this type of unit—and that the badge of 7 Staffel, Stukageschwader 1 is marked on the cowlings. The rims of the machine gun ports in the wing leading edges are painted yellow.



were plagued during the hot season by the thick and penetrating dust stirred up on their airstrips. For this reason tropical intake filters were fitted, and fighters were often supplied to this sector finished in the overall sandy brown more commonly associated with North Africa. Another source of confusion is the white belly-band frequently seen on fighters operating in this area.

The more usual identification colour used on Luftwaffe aircraft of all types during the Russian campaign was yellow; this often appeared in the form of a belly band, and the undersides of wing tips were frequently painted in the same shade. The entire engine cowlings were sometimes painted yellow, or the engine undertray only. Belly bands differed in width and position, sometimes appearing at the rear of the fuselage, sometimes in a central position with the Balkenkreuz superimposed. This yellow identification is no more conclusive as evidence of location than is white, unless the wing tips are seen to be painted to match. Yellow belly bands were observed on aircraft in Russia, Northern France, and Sicily; and no central control of the use of these coloured bands has been proved.

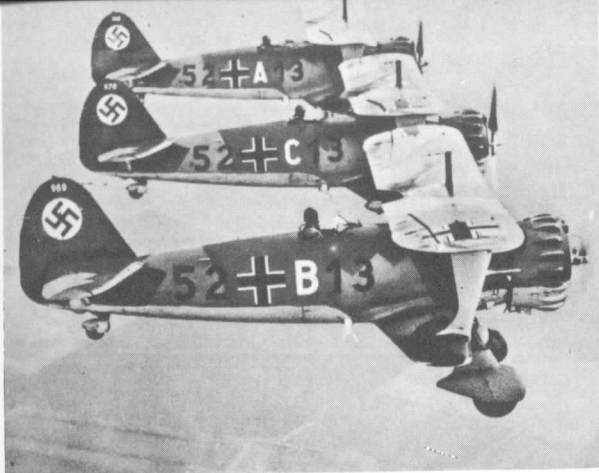
As the war drew into its final stages the colour schemes of fighters on the Russian Front, as on all other fronts, became more and more diverse. Under the conditions of a disintegrating front line and ravaged lines of communication, the burden of control and administration passed further and further down the command chain until individual Gruppen were literally fending for themselves, and retouching different paint schemes with whatever stocks of dope were available. Beyond repeating the basic tenet that summer schemes were based on the "splinter wings and tail, mottled fuselage" rule, and winter schemes upon the use of water-soluble white paint, one can lay down no binding principles.

### The Late-War Years: Western Europe

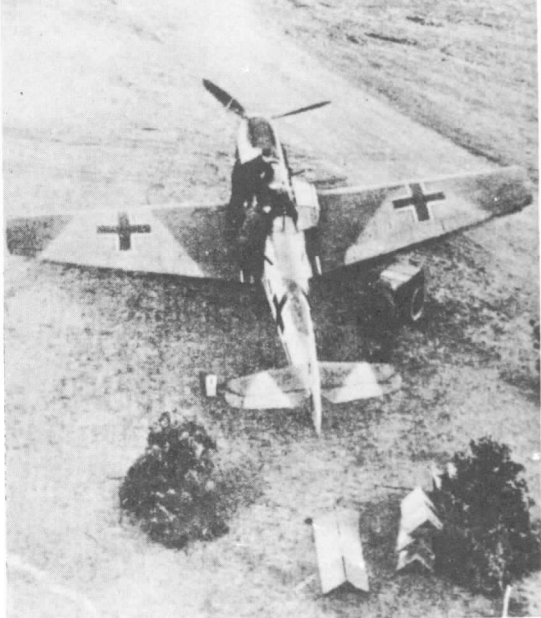
The second major day fighter to enter service with the Luftwaffe was the Focke-Wulf Fw 190A, which was first delivered to the Jagdflieger on the Channel Coast early in 1942. From the start the Focke-Wulf appeared in a less rigidly controlled scheme than the early Bf 109s. The basic splinter of two greens was applied to the wing and tail upper surfaces, but the divisions between the colours were much wavier and less distinct than had been the case with the Messerschmitt. The spine of the fuselage was also finished in areas of these two colours, but to call this a "splinter" pattern would be stretching a point. The most one can safely say is that two or three large, irregular areas of these two shades alternated along the fuselage top surface. The pale blue of the fuselage sides and the camouflaged spine met in a soft over-sprayed line, and blotches of one or both of the two greens, or RLM grey, were sprayed onto the upper half of the fuselage sides over the blue, to produce an almost imperceptible merging of the main areas of colour. The vertical tail surfaces were sometimes pale blue with mottled patches; sometimes, the blue was confined to the rudder, and the fixed fin was patterned with sprayed blotches of grey or green. View C5 illustrates an early Fw 190A colour scheme.

The subtle changes which took place in the European day fighter scheme during 1943 and 1944 are extremely esoteric, and as with so much of this field of research, no firm rules can be discovered. A good example of mid-war fighter finish is provided by view C6, a Bf 109G-6 of JG 3 "Udet", based in Holland in 1943. This view should be compared with D1, a





Above: Neat formation by Hs 123's of St. G. 163 'Immelmann' in standard pre-war camouflage. (R. Ward)



Bf. 109E in early non-standard splinter scheme, 1940. (E. J. Creek)

#### Home Defence fighter of JG 300.

Between 1941 and 1944 the trend had been for colour divisions to become softer and less distinct, and for the mottling of fuselages to merge one colour into the next so effectively that one is hard put to it to describe the actual colour of the aircraft. Yet in 1944 we see an apparent reversal—on some aircraft, at least. The lower edge of the camouflage on the spine becomes more obvious, almost a hard wavy line. The mottling becomes once again a definite spotting of a dark colour on a light background. One inexplicable practice is the obtrusive marking of the *Werke Nummer*; previously painted in tiny characters—when it was painted at all—this is now marked in quite large figures, standing out sharply at the top of the pale blue fin.

The most obvious marking carried by the "Gustav" in view D1 is the blue and white band around the rear fuselage. During 1944 the Allied day-bombing offensive seriously overtaxed the resources of the Fighter Arm. Fighter Gruppen which could ill be spared were pulled out of the line in Russia and Italy and shifted to Home Defence duties; and this strain obviously worsened immeasurably after the successful landings in Normandy, which led to air battles which caused the Luftwaffe disastrous losses in machines and pilots. The extraordinary performance of the German industrial machine would, in time, make good the material losses; but the men could not be replaced.

The Home Defence Command, or Reichsverteidigung, identified its aircraft by bright bands of colour around the rear fuselage. Many theories have been advanced to explain the colours used; as existing photographs are all in monochrome, and are of varying quality and fidelity, it is not surprising that confusion exists. It has been suggested that each Geschwader in the Home Defence network had its own two-colour combination; or alternatively, that each airfield had an identifying colour. On the other hand Karl Ries suggests that there were only two types of coloured band; that in 1944 all Home Defence fighters carried a single broad red band, and that in 1945 this was changed to a blue-white-blue combination. The present writer is inclined to support Herr Ries' theory. It should be noted that the black vertical bar on the white stripe in view D1 is not part of the Reichsverteidigung marking, but simply the symbol of III Gruppe, JG 300.

The late model Focke-Wulf illustrated as view D2 displays the red Home Defence band, and also an increasingly common variation in day fighter camouflage of the period—the two shades of green are replaced by light and dark grey, both on the upper and side surfaces. The next view, D3, shows the excellent Jumo-engined Focke-Wulf Fw 190D, which played a considerable part in the defensive battles on both fronts during 1944 and early 1945. The standard scheme is shown;

the wings and tail are painted in the splinter or shadow-shading of two greens while the spine, down to an irregular but distinct lower edge mid-way down the fuselage sides, is sprayed in a dense blotching of black-green. The under-surfaces are pale blue, giving way softly on the lower side surfaces to patches of RLM grey.

One feature common to most German day fighter patterns of the late war years was the decoration of the spinner; the earlier coloured patterns associated with sub-unit identity largely gave way to a simple white spiral on the black spinner. This spiral was sometimes painted in other shades such as red and yellow, retaining some significance as a unit identity marking, but black and white was by far the most common combination. It has been suggested that this pattern was intended to put bomber air-gunners off their aim, a head-on view of the spinning spiral having a mesmeric effect; the present writer does not feel that too much weight should be placed on this theory. It was a striking and attractive marking which could do no harm and might conceivably do some good, and the visual appeal was probably the basis of its popularity.

The last months of the European fighting saw the introduction to combat service of the first generation of jet and rocket interceptors, and examples of their colours are illustrated in views D4, 5, 6 and 7. The Messerschmitt Me 163 Komet rocket fighter was painted in a variety of ways; only one unit operated them in action, and the comparatively small batch of machines available were probably repainted several times during their progress through the training echelons and on to Jagdgeschwader 400. The most frequently observed scheme was a straightforward splinter of the two basic greens over all upper and side surfaces, with pale blue undersides. Green or grey mottle was sometimes applied overall, and some machines sported splinter pattern on upper and side surfaces with the exception of the vertical tail, which was left in pale blue and mottled with patches of green. Simple numbers appeared on the rear fuselage, not often colour-coded by Staffel.

The Me 262 twin-jet fighter was subject to no firm rules of colouring, and many local variations have been confirmed. The most widespread scheme seems to have been a simple splinter of the two green shades on wing and tail upper surfaces; the top area of the fuselage was finished in fairly hard-edged patches of these two shades, fading off into a heavy mottling on the sides. One colour overall finishes were not unknown, and occasionally the vertical tail surfaces would be painted as described for the Me 163 above—black-green patches on pale blue. It has been said that the belly-bands observed on Me 262s were in unit-coded combinations of colours. Red and yellow have frequently been quoted; whether other combinations were employed is not confirmed.

The He 162 rocket fighters of JG 1, which never saw action, were usually finished in a simple scheme of dark green or



Messerschmitt Me 410A-1 carrying the insignia of II/ZG 26 and the code of Stab III/ZG 26, scheme as for side-view colour illustration E6. Code JN+CD. (U.S. Nat. Arch.)

black-green on all upper surfaces and pale blue on the undersides, the two colours meeting in a hard division along the mid-point of the fuselage sides.

Finally, it must be emphasised once more that for every general trend in German fighter finish during the war years, there are many known exceptions. In a book of this size, only the main guidelines can be included.

## TWIN ENGINE FIGHTER UNITS

Germany was an enthusiastic supporter of the "heavy fighter" theory, which held that a fast twin engine two-seat fighter, with a heavy nose armament and long range and loiter capability, could cut a way through enemy defences for the bomber aircraft; and could also provide an effective defence in friendly airspace, by means of long standing patrols which were not limited by the need to return to base for refuelling after a short interception sortie, as were the flights of the single-seat fighters.

The *zerstörer* (destroyer) concept was championed by Göring, who pressed for the introduction to service of the Messerschmitt Bf 110 despite the rather disappointing performance of this aircraft during its test programme. The formation of the *Zerstörergeschwader* was pushed ahead rapidly in 1939, and so anxious was the *Reichsmarschall* to see his pet force become a reality that he instituted steps which damaged the morale of the Luftwaffe's single engine fighter units; some of the best pilots were creamed off and transferred to the *Zerstörergeschwader* before the Bf 110 was available in sufficient quantities, and spent their time flying antiquated models of the Bf 109 already discarded by their old units!

A small number of Bf 110s saw action during the Polish campaign of September 1939, solely in a ground attack capacity. Their colour scheme was simple; all upper and side surfaces were finished in *schwarzgrün*, which met the pale blue of the undersides in a hard line low on the fuselage sides. This scheme was retained well into 1940; it was employed in Norway and Denmark, and the Battle of France, and by most units during the Battle of Britain. An example of an aircraft which fought in the latter campaign is illustrated as view E1.

During the fighting over the Channel and South-East England during the summer of 1940, a modified scheme came into use with some units; a scheme which with minor variations would remain in use for most of the rest of the war. The overall *schwarzgrün* was replaced on the upper surfaces by a splinter of both the standard greens; high on the fuselage sides this faded off in a soft division into a mottle of both shades of green, or of RLM grey, which in its turn gave way to the pale blue of the belly low on the fuselage sides. An early example of this scheme is shown as view E2; incidentally, the aircraft illustrated, a machine of *Erprobungsgruppe* 210, is also significant as one of the earliest examples of a Bf 110 used as a hit-and-run bomber.

The markings used by the Bf 110 day fighter and ground attack units were in line with those of bomber rather than single engine fighter units. The national markings appeared in conventional positions above and below the wing tips and mid-way down the fuselage sides, with the swastika painted low on the outside face of each fixed tail surface. On the fuselage sides appeared a four-character code, characteristic of all types of Luftwaffe unit with the exception of single engine fighter (and certain ground attack) formations.

The first two characters, almost invariably a letter-number combination, identified the *Geschwader*; certain formulae did

cover the selection of this code for each *Geschwader*, in the early days of the Luftwaffe at least, but they are so tortuous that it is simpler to regard the codes as purely arbitrary. *A listing of all known codes accompanies this text.*

The *Geschwader* code was followed by the fuselage *Balkenkreuz*. Immediately to the right of the cross appeared the third letter, identifying the aircraft within the Staffel. With a few exceptions these letters were also allotted on an arbitrary basis; more often than not the *Geschwader Kommodore* flew aircraft "A", but beyond this little is certain. This third letter was often painted or outlined in the Staffel colour, following the same sequence as in single engine fighter units—i.e. white, red, yellow. Gruppe Staff aircraft were identified by green letters, and *Geschwader* Staff by blue.

The fourth letter identified the Staff flight or Staffel within the *Geschwader*. Theoretically this letter was allotted according to a rigid sequence, as follows:

- A *Geschwader* Staff
- B I Gruppe Staff
- C II Gruppe Staff
- D III Gruppe Staff
- E IV Gruppe Staff (where applicable)
- F V Gruppe Staff (where applicable)
- H 1 Staffel
- K 2 Staffel
- L 3 Staffel
- M 4 Staffel
- N 5 Staffel
- P 6 Staffel
- R 7 Staffel
- S 8 Staffel
- T 9 Staffel
- U 10 Staffel (where applicable)
- V 11 Staffel (where applicable)
- W 12 Staffel (where applicable)
- X 13 Staffel (where applicable)
- Y 14 Staffel (where applicable)
- Z 15 Staffel (where applicable)

It will be noted that to avoid possible confusion, the letters G, O, and Q, and I and J, were omitted from the sequence.

It must be emphasised that as early as 1940 German documents show beyond doubt that aircraft were moved around within a Gruppe or *Geschwader* according to combat requirements, with little reference to codes originally painted on them. Machines carrying the "P" coding of the 6th Staffel, for instance, might fly with the 2nd Staffel for days or weeks before being repainted with new codes; and in loss returns they appear as 2 Staffel aircraft, even though the 6 Staffel code is quoted.

This four-character code would sometimes be repainted in full under both wings, one character inboard and one outboard of each *Balkenkreuz*; e.g., an aircraft coded 3M + JL on the fuselage would be painted under the wings with the sequence 3 + M, J + L. These codes were painted in such a way that they would be readable if the aircraft was passing over the observer from front to back. The practice of marking the full code under the wings was largely confined to the first two years of the war, although there are many known exceptions. By the summer of 1940 it was more common to find the individual aircraft letter only, painted under each wing tip outboard of the cross. In the case of twin engine fighters, and less commonly with bombers, it was not unusual to find the

individual letter painted in the Staffel colour outboard of the cross on each upper wing tip.

The airscrew spinners of the Bf 110 were frequently decorated in Staffel or Gruppe colours; the elaborate patterns sometimes seen on fighters were not generally used, a simple coloured tip or stripe being the most common practice. In view E1, a white spinner tip indicates the 1st Staffel; view E2 shows an unusually involved marking, with bands of white and red indicating I Gruppe and 2 Staffel respectively. Unit badges were often painted on the nose immediately forward of the cockpit.

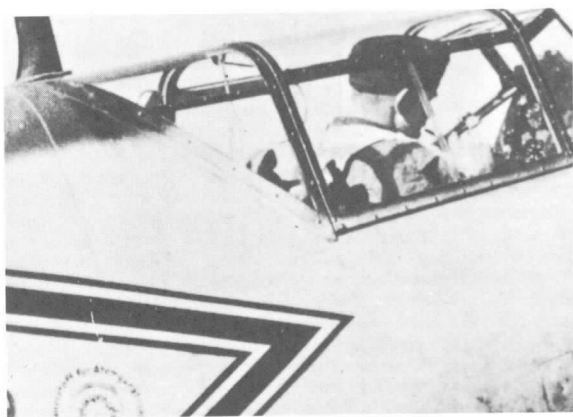
The variations of camouflage which appeared among zerstörer units as the war progressed were many, but few are particularly significant. Generally the "Splinter upper surfaces, mottled sides" rule held good in all temperate zones. The density and distinctness of the mottling, its method of application and areas of use all varied widely and arbitrarily. Sometimes two shades of grey replaced the more usual greens. Sometimes the spine of the fuselage was mottled; sometimes it was painted in one solid shade, fading off into the mottling lower down.

The main variations were dependent on geographical factors; and views E3 and E4 illustrate aircraft used in North Africa and Russia. Some machines which served in the desert campaigns were painted in sand brown all over; sometimes this joined the pale blue of the undersides in a hard line low on the sides, sometimes it faded off in a soft oversprayed division. It was not usual for this scheme to be further embellished with blotched camouflage in green or brown, but examples have occasionally been recorded. On the other hand, many Bf 110s used in the desert were apparently delivered and flown while still in a temperate zone scheme of greys or greens. White areas under the wing tips and white belly bands of varying widths are characteristic of Bf 110s in North Africa.

In the Russian winter campaigns the Bf 110s, like every other Luftwaffe type, were usually overpainted in white, the exact appearance depending on care of finish and degree of weathering. The yellow identification patches were applied to Bf 110s in Russia, summer and winter. Apart from the yellow belly band, there were isolated examples of other types of band being applied—e.g. a narrow red band immediately behind the level of the wing trailing edge—but the significance of these is not confirmed; either tactical considerations or an extension of Staffel colour coding could provide the explanation.

Following its failure as a fighter in the Battle of Britain, the Bf 110 was used on other fronts in a wide variety of rôles, light bombing, ground support and reconnaissance being the most prominent. Its range and speed, heavy nose armament and useful bomb-carrying capacity made the type an important addition to Germany's overstretched ground attack armoury as the war situation deteriorated. Losses were sometimes heavy, as is inevitable in battlefield support operations; some units were disbanded and reformed two or even three times, a fact which is reflected in the list of unit codes accompanying this text. In the last two years of the war, when the shifting balance of air superiority rendered the Luftwaffe more and more vulnerable to air attack on its bases, national and unit markings on all types of aircraft were constantly being simplified. The black and white Balkenkreuz and Hakenkreuz often gave way to low visibility black or white outline styles; Geschwader codes were painted in tiny characters, for ground handling purposes only; and sometimes only the individual letter was marked on the aircraft. These practices are apparent on examples of aircraft of all types, including two categories in which the twin engine fighter figured prominently—night fighters, and heavy defensive day fighters.

The night fighter force founded in 1940 by General Kammhuber used large numbers of Bf 110s from the outset. Their range and armament made them ideal for this type of mission, and speed and manoeuvrability were quite adequate for combat with heavy bombers. Until 1942 the Bf 110 and Junkers Ju 88 night fighters were painted in an overall matt black scheme; unit codes on the fuselage sides were usually in grey, or occasionally in dull red. The white areas of the national markings were frequently painted out. A badge used by many units of the Night Fighter Arm, the "Englandblitz", was often marked on the nose under the cockpit; it was also



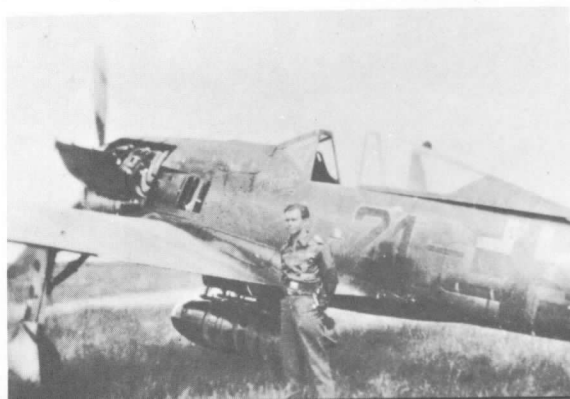
Detail shot showing the Gruppen Adj. marking on a Bf 109E-3. (E. J. Creek)

quite common for a white Roman numeral indicating the Gruppe of the aircraft, to be painted below the pilot's position. View E5 shows a Bf 110 finished in this way.

For the last two or three years of the war a new type of scheme was applied to night fighters, originally designed for machines operating under high visibility conditions—i.e. over the actual target area, where fires lit up the sky, and on bright moonlit nights. The normal pale blue shade used on the under surfaces of all Luftwaffe types was extended over the whole aircraft; the upper and side surfaces were then mottled in dark grey. The lower boundary of this mottling, the density of the grey patches, and the exact style of application varied widely. The Junkers of 4./NJG 1 illustrated as view F1 displays large, soft blotches of dark grey; the national markings have been reduced to a simple black outline style for the Balkenkreuz and a solid black swastika, but the four character code is marked in its standard size. View F2 shows a later aircraft on which the dark grey appears as a continuous series of wavy lines—the so-called "wave-mirror" effect. Interestingly, this machine retains the white edge of the Balkenkreuz on the fuselage. Other spraying styles include a high-density pattern of small grey flecks, and a pattern of rather more sharply defined "holly-leaf" patches. It should be noted that some aircraft carried the individual letter only under the wing tips, while others carried the individual and Staffel letters under one or both wings: e.g., E + H, E + H; or, (blank) + (blank), E + H. The small characters of the Geschwader code in view F2—D9, for the Nachtjagdstaffel Norwegen, an autonomous unit—are typical.

Apart from the well-known night fighter versions, the Junkers Ju 88 also featured among its numerous progeny a small production run of day fighters. The Ju 88C served in integrated Zerstörerstaffeln within several Ju 88-equipped bomber units, notably KG 30 during the Battle of Britain, and KG 6 in the West and Russia later in the war. The long-range maritime bomber unit, KG 40, based for much of the war at Bordeaux for Atlantic patrols with the Fw 200 and He 177, mustered at one time a V Gruppe, composed of three Staffeln of Ju 88C day fighters. These aircraft undertook

Focke-Wulf Fw 190A of JG 101/105 Training Wing on a French airfield during 1944. Note 'Anni' under cockpit. (H. Obert)





operations both against Allied shipping and against R.A.F. Coastal Command patrol and convoy protection machines. The day fighter versions of the Ju 88 were normally painted in exactly the same fashion as the bomber versions, that is, almost invariably in standard splinter camouflage of two shades of green; but occasionally a wave-mirror pattern of light grey or pale blue lines was applied over the green.

Like all branches of the Luftwaffe the Zerstörergeschwader suffered heavily in the last year of the war from Allied air superiority over both Western and Eastern Fronts, and from the conflicting demands of battlefield support and home defence. During the massive Allied daylight bombing offensive over Germany and Occupied Europe several twin engine fighter formations were pressed into service in the latter rôle; the same considerations which had led to their use as night fighters fitted them for this task, and their size and strength made them ideal test-beds for various unorthodox armament layouts, notably the mounting of one or more heavy cannon for use against the Fortress and Liberator formations. An example of an Me 410 armed in this way is shown as colour view E6; the aircraft is painted in one of the many different "splinter/mottle" combinations. Heavy fighters proved effective against the bomber formations, but were obviously fatally vulnerable to the attentions of Allied single-seat escort fighters.

### DIVE BOMBER AND GROUND ATTACK UNITS

Probably the best-known and most charismatic of all Germany's combat aircraft was the Junkers Ju 87—the dreaded Stuka. The Luftwaffe pioneered the use of the dive bomber in battlefield support operations, and the Stukageschwader occupied an important place in the German armoury for the first half of the war.

A small number of Ju 87A bombers were sent to Spain in 1937 for combat evaluation; photographs show that they were finished in the three-shade segment camouflage normal for home-based German bombers at that time—i.e. dark green, dark reddish brown, and pale grey, in large, irregular, straight-edged patches over all upper and side surfaces, with pale blue or pale grey undersurfaces. In the last months of the Civil War the first small batch of Ju 87B-1s were rushed to the front; these were finished in the current German scheme of black-green over all upper and side surfaces. Both Ju 87A and Ju 87B aircraft in Spain bore the standard Nationalist markings described earlier in the text; the type number carried on the fuselage sides was "29". The Stuka flight, which was on detachment from the Luftwaffe's first Stuka unit, St.G. 163 "Immelmann", was known as the "Jolanthe Kette", after a favourite cartoon character of the time, Jolanthe the Pig; and some aircraft carried on the outer face of the wheel spats a badge showing a stylised pink pig on a white oval ground. The Stukas were often decorated with coloured aircrew blade tips in the form of bands of red/yellow/red—the Nationalist colours.

The Ju 87As of St.G. 163 based in Germany in 1937 were



Heinkel He 162A-2 of 3./JG 1 in standard scheme, see side-view colour illustration D7. (W. Liss)

marked, as stated above, with a three-colour segment camouflage. Initially the red tail band with the black swastika in the white disc was carried; this gave way to the later form in 1938, the white-trimmed black swastika being placed centrally, falling across the rudder hinge line. The five character code of the day, described in the earlier part of the text, was marked on the fuselage sides and repeated under the wings. A typical aircraft bore the code 52 + E26:

5 = Luftkreis V, München  
 2 = St.G. 163, second Geschwader formed in Luftkreis V  
 +  
 E = Individual aircraft letter  
 2 = II Gruppe, St.G. 163  
 6 = 6 Staffel, St.G. 163

With the appearance of the Ju 87B late in 1938 the simple scheme mentioned above was introduced in place of the segment camouflage; all upper and side surfaces were painted in *schwarzgrün*, with pale blue undersides. The Ju 87As were repainted in this scheme and largely phased out of combat formations; they soldiered on in training schools for many years. The five character code was replaced by the four character code used for the rest of the Luftwaffe's life, this being occasionally repeated in full under the wings. Photographs exist which show the early Ju 87Bs carrying both four character fuselage codes and a small white number painted on the sides of the cowlings and on the outside faces of the wheel spats. This does not seem to be related to any part of the conventional code, and is unexplained. The Staffel was broken down into three or four "Ketten" of three aircraft each for tactical purposes; during the war, the term Kette was used loosely for any grouping of three machines, but in the Luftwaffe's early days the Kette had an official identity within the Staffel. It may be that these small numbers refer to the Kette.

It was in this basic colour scheme that the Stuka went to war in Poland on September 1st 1939. The faith placed in the dive bomber by the Luftwaffe High Command led to a rapid expansion of the Stukageschwader, and 366 aircraft were available for the attack on Poland. The dive bombers continued to build their fearsome reputation in Holland, Belgium and France in 1940; and then were brought to a sharp halt in

Junker Ju 87A's of St. G. 163 'Immelmann', 1937. Note variations in camouflage pattern. (U.S. Nat. Arch.)



the summer of that year by appalling losses in the Battle of Britain, where they faced for the first time a modern and determined fighter defence. In all these campaigns the Stuka appeared in its standard *schwarzgrün* warpaint, and a typical example is illustrated as colour view **G1**.

Withdrawn from the Channel Front to areas where its undoubted strengths could be employed at less cost, the Stuka repeated its early successes against troops and communications targets in the Balkans and Greece in the spring of 1941. The only major change in appearance was the addition of large areas of yellow paint, usually comprising the entire engine cowlings and sometimes the rudder. View **G2** illustrates a machine of Stukageschwader 3 in this scheme.

The invasion of Russia in June 1941 saw the Stuka once again hacking into the ground defences, which were undefended by effective fighter screens. Again, large areas of yellow were applied to the *schwarzgrün* aircraft, usually in the form of a belly band and almost invariably under the wing tips. The belly bands varied in width and position.

Meanwhile, far to the South, other Stuka units were deployed to support the Axis forces in the North African desert. The usual scheme for desert operations consisted of the standard sandy brown overall upper and side surfaces, often further camouflaged by the application of dark green or dark brown; the common style was a mottling of green, varying fairly widely in density. Weathering was obviously a major factor in this theatre, and caused endless differences in appearance. A "near mint" example of desert camouflage is illustrated as view **G3**, a machine of Stukageschwader 1 captured at Derna in Libya. A less common style is shown in view **G4**, which displays green paint applied in large wavy-edged areas comparable to R.A.F. shadow-shading camouflage. The same scheme, but with dark brown instead of green, was observed on some Ju 87Ds late in the Tunisian fighting of spring 1943.

The much-improved Ju 87D first went into action in Russia in mid-1942, and was generally painted in the simple overall black-green scheme of earlier models, but photographs do show some finished in splinter pattern of *schwarzgrün* and *dunkelgrün*. For winter operations they naturally received a wide variety of snow camouflage patterns, ranging from carefully applied white overall, through an enormous diversity of spots, mottles, flecks, streaks, squiggles and scales. The white paint was often applied wholly or partially over some of the national markings; and as the Stuka units followed the general practice of cutting down on the size and number of markings carried, some machines became almost anonymous apart from the yellow wing tips and belly bands, and the individual letter of the code. The Ju 87D illustrated as view **G5** is a good example of this tendency; **G6** shows a Ju 87G "tank-buster" in the simple temperate climate scheme, with abbreviated markings. As with other branches of the Luftwaffe, the Stuka units operating in the last two years of the war were often forced to use whatever paint was available to repaint aircraft, and although green remained the most usual colour, schemes involving grey were not unknown; even brown has been said to have been used in Russia in 1944.

The Stukageschwader were noteworthy for the wide variety of colourful unit insignia, normally painted below the pilot's cockpit position. Spinner decoration on Stukas generally followed the tendency of Zerstörergeschwader; simple coloured tips and stripes were most commonly used. The individual aircraft letter was sometimes repeated in the Staffel colour on the front and/or outside face of each wheel spat.

### The Schlachtgeschwader

Apart from the Stukageschwader, the Luftwaffe had on strength two other categories of ground attack unit; the designations and redesignations within the whole sphere of ground attack aviation are somewhat confusing. During 1941 and 1942 Germany fielded on the Eastern Front two Schlachtgeschwader—"Battle Wings"—of ground attack machines. Abbreviated to Sch.G 1 and Sch.G 2, these units each comprised two Gruppen of four Staffeln each; they operated several types of aircraft, the most notable being the elderly Henschel Hs 123A biplane, the tank-busting Hs 129B, and bomb-carrying Messerschmitt Bf 109Es. The standard colour scheme for the former two types was a coat of *schwarzgrün*

over upper and side surfaces, with the usual areas of yellow—belly bands, undersides of wing tips, sometimes noses and cowlings—indicating the theatre of operations. The colour views **I3** and **I4\*** illustrate examples of these aircraft. The Messerschmitts were usually finished in standard fighter schemes—splinter and mottle, either in two shades of green, or two shades of grey—with, again, distinguishing areas of yellow; see title page.

These aircraft were marked in a characteristic way. Each aircraft was identified by an individual letter painted in the Staffel colour, in the sequence white-red-yellow-blue. Each aircraft also carried an equilateral triangle marking; this was usually painted in black with a white outline, but cases occurred of a simple white outline being painted directly on to the *schwarzgrün* of the fuselage. If the triangle was in front of the fuselage cross marking, and the letter behind it, then the machine served with I Gruppe in its Geschwader; if the order was reversed, then it served with II Gruppe. View **I3** provides an immediate contradiction of this practice, but is known to be authentic—just another proof of the looseness with which some marking regulations were observed.

In addition to the Stukageschwader and Schlachtgeschwader, there were also two Schnelles Kampfgeschwader—"Fast Bomber Wings"—designated SKG 10 and SKG 210. The latter was formed in 1941 from the famous Battle of Britain unit Erprobungsgruppe 210. It was mainly equipped with the Bf 110 but at least one Staffel reverted to the Bf 109 later in the war. Camouflaged in accordance with its area of operations, SKG 210 retained the four character fuselage codes born by its Bf 110s in 1940, identified by the first two characters "S9".

SKG 10 was formed in the spring of 1943 under the command of the Fliegerführer Atlantik for operations over the Bay of Biscay, but was soon moved north to Amiens and mounted a campaign of day and night hit-and-run bombing attacks on Great Britain. In July 1943, II, III, and IV/SKG 10 were moved to Italy. The Geschwader was equipped with Fw 190A-4 fighter-bombers, delivered in normal day fighter camouflage. They received a coat of matt black paint for night operations, covering the whole underside and extending up the fuselage sides and over the vertical tail surfaces, ending in a ragged division not far below the cockpit, and obscuring all but the upper wing markings. From the outset, aircraft of SKG 10 had been marked in Schlachtgeschwader fashion, and sometimes the individual letter was left showing through the night camouflage. Colour views **H1**, **H2**, and **H3** illustrate aircraft of the Schnelles Kampfgeschwader in typical camouflage and markings.

The picture is further complicated by the complete reorganisation and renumbering of the ground attack units in October 1943, which brought into being the so-called "second" Schlachtgeschwader. From this point on all ground attack units were designated Schlachtgeschwader, identified by the new abbreviation "SG". The former Stukageschwader were simply renamed—e.g. St.G 77 became SG 77. Additionally, Sch.G 1 and 2 became SG 4 and SG 9 respectively, and SKG 10 became SG 10. This reorganisation coincided with a major effort by the Luftwaffe to replace the ageing Stuka in as many units as possible, largely with the far superior Fw 190

\* See Vol. 2.

A pair of Bf 109Es involved in a collision on a Balkan airfield, note yellow fuselage band and rudder. (G. Joos)

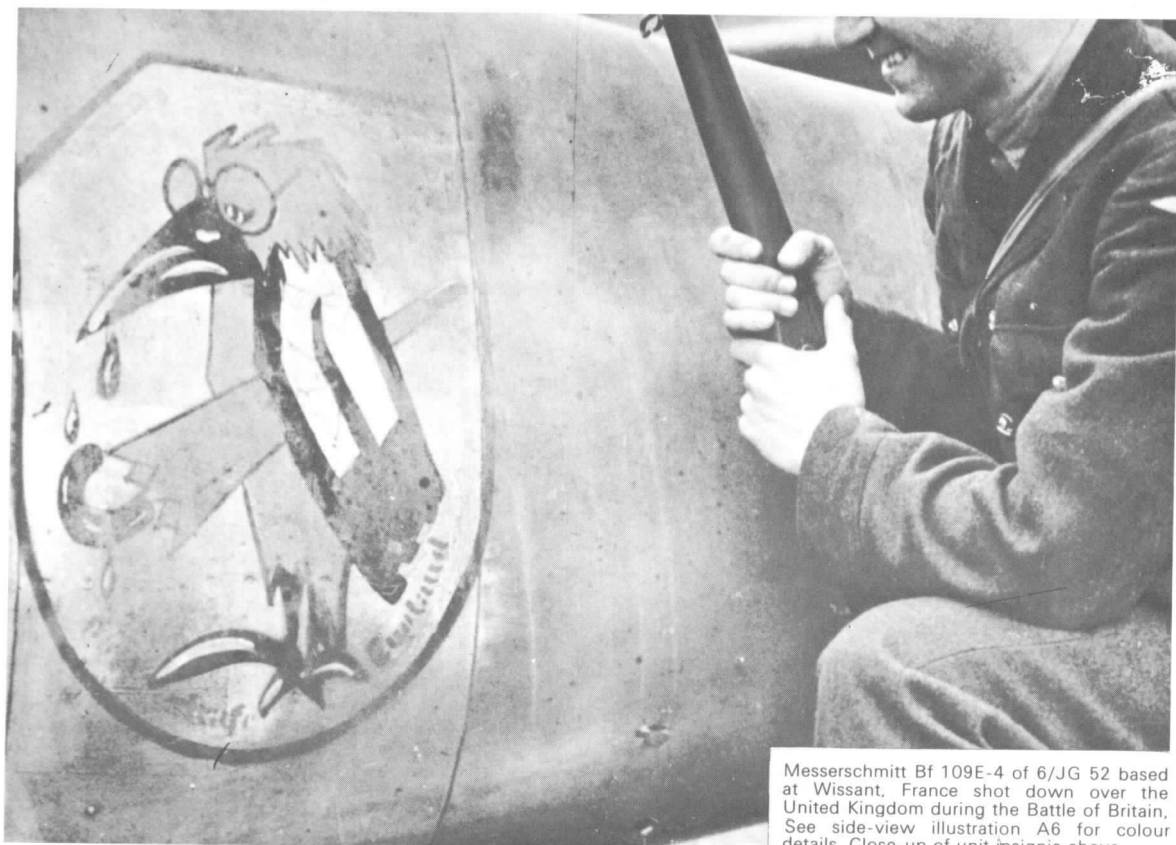


ground attack versions; the advantages of a fast and versatile fighter-bomber over a slow and specialised dive bomber were obvious.

The camouflage and markings of the ground attack units became even less centralised from this point onward. Colour views **H4** and **H5** illustrate aircraft hurriedly painted in terrain-oriented camouflage; one was observed on a dusty, scrub-fringed Mediterranean airstrip, the other amid the mud, snow and skeletal vegetation of an Eastern European winter. Markings mainly reverted to a single number or letter in front of the fuselage cross. By the end of the war no significant variation between fighter and ground attack versions of single engine aircraft was reflected in camouflage or markings; the sometimes wild flights of pointless ingenuity typical of the period applied equally to both types of unit. An example is illustrated as view **H6**, a garishly-painted Focke-Wulf Fw 190F-9 operating in the anti-shipping rôle on the Baltic Coast in the spring of 1945.

Apart from Gruppe and Staffel badges, which were marked

on some ground attack aircraft in exactly the same fashion as on fighters, there were two other types of marking quite frequently observed on the machines of battlefield support squadrons. As an earnest of the great contribution made to ground warfare by these pilots, under conditions of extreme danger, some units were allowed to mark their aircraft with the Wehrmacht combat infantryman's badge. This insignia, the *Infanterie Sturmabzeichen*, was awarded "to officers and men of rifle companies in Infantry and Mountain Infantry Regiments who had participated in at least three first-wave assaults on at least three different days, and had penetrated the enemy line with weapon in hand". The design was painted on Hs 123s, Hs 129s and Fw 190s in white or pale grey; it was carried in the conventional position under the cockpit, on the fuselage side, or, in the case of some Hs 129s, on the nose top decking immediately ahead of the windscreen. Another marking practice apparently peculiar to Hs 129 units was the painting of a row of small silhouettes of tanks, trucks, etc., on the rudder in a tally of vehicles destroyed.



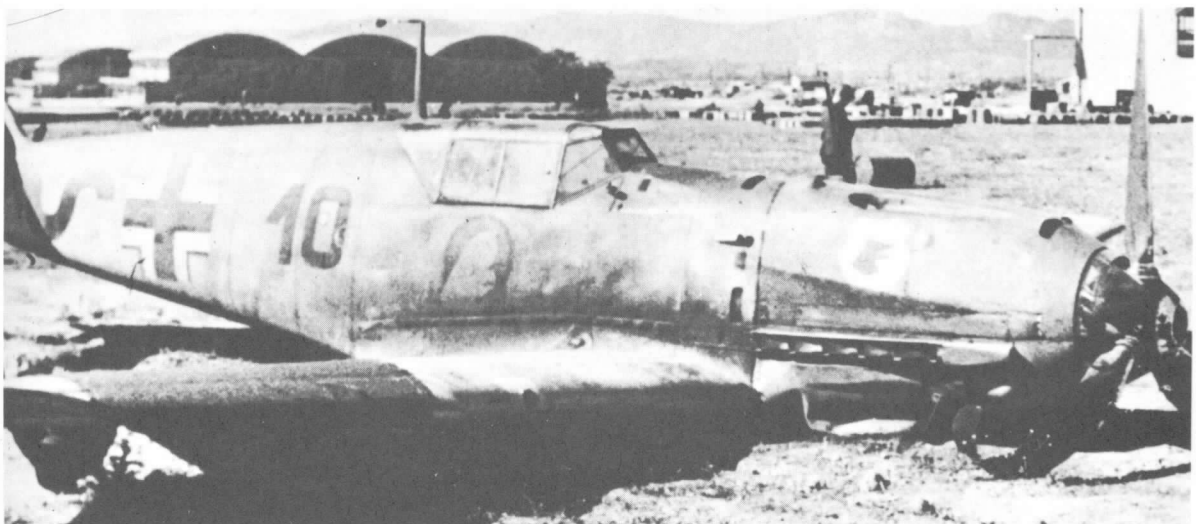
Messerschmitt Bf 109E-4 of 6/JG 52 based at Wissant, France shot down over the United Kingdom during the Battle of Britain. See side-view illustration A6 for colour details. Close-up of unit insignia above.







Above: Messerschmitt Bf 109B-2 of 2./J88 Legion Condor, Brunete area, Spain, June 1937. The photograph was apparently taken before the application of the 'Top Hat' insignia or is not the same aircraft as illustrated in colour side-view A1. (H. Obert)



Above: Bf 109E-7/Trop of III/JG77 shot down in Greece during the spring of 1941. Note personal insignia on both port and starboard sides, see side-view illustration B2 for colour details. (I.W.M.)

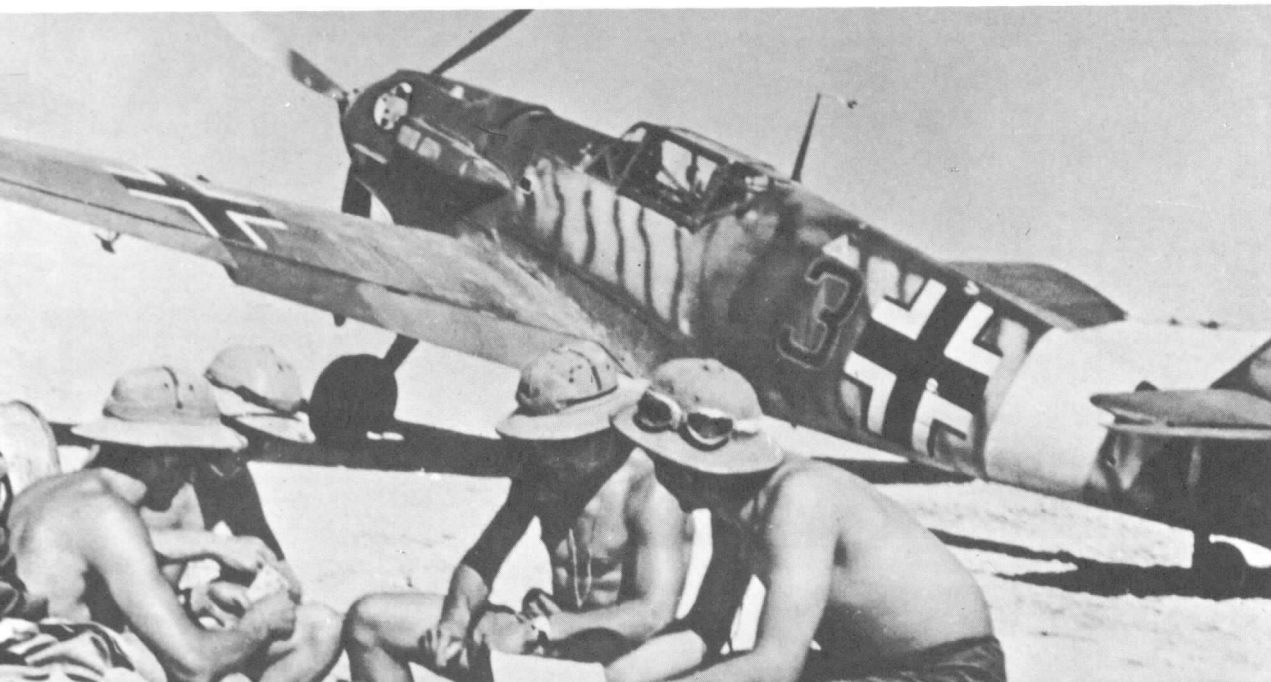
Below: Bf 109E of 7./JG 26 'Schlageter' in Sicily during 1941. Note the red heart insignia of 7./JG 26 on what appears to be an all white nose. (U.S. Nat. Arch.)



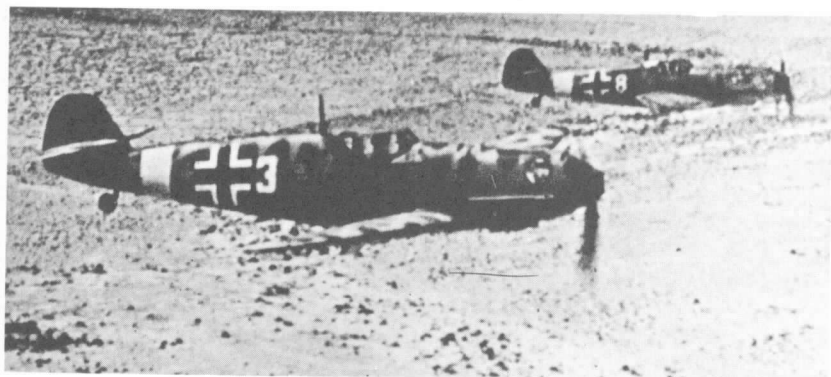
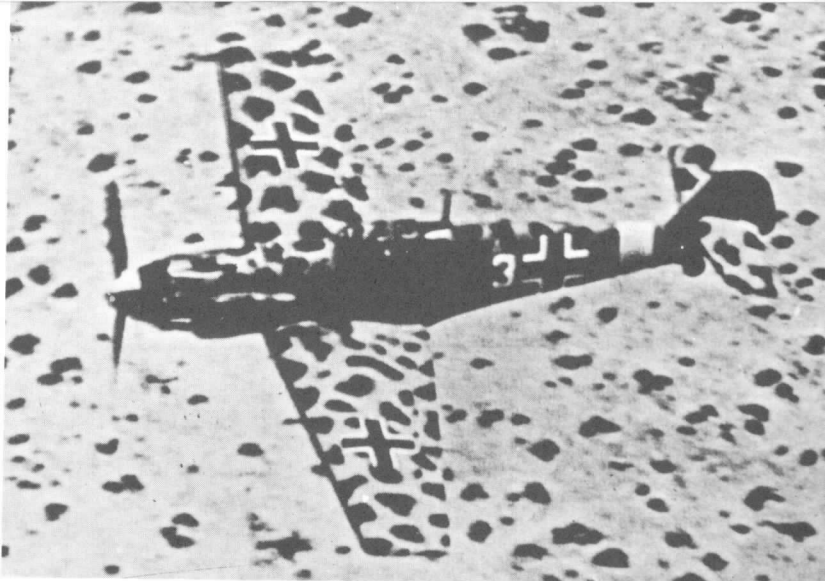


Above and left: A pair of fine flying shots of Messerschmitt Bf 109E-4(N) Trop of I/JG 27 over the Med. and Western Desert during the summer 1941. Colour scheme the same as side-view illustration B3 with the exception of the aircraft number which is a black stencil style 8 thinly outlined in red.

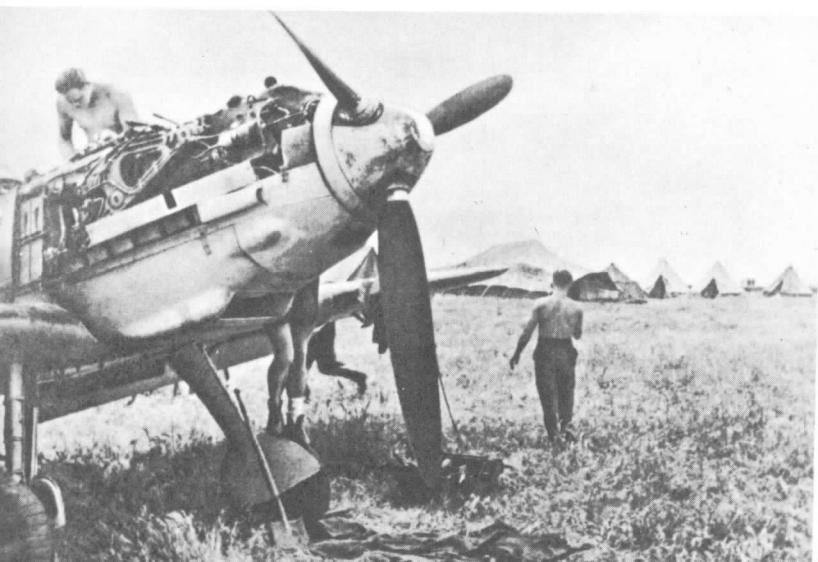
Below: Another Bf 109E of I/JG 27 with a far from standard fuselage scheme. Upper surfaces in standard splinter scheme, pale blue fuselage sides sprayed with drab green and dark green stripes. Black 3 thinly outlined with red. (Photos R. Ward)



Right and below: Bf 109E-4(N)Trop of I./JG 27 the subject of side-view illustration B3, the upper photograph is well known but interesting nevertheless, white 8 in the lower photograph is similarly camouflaged. (R. Ward)



Below: This Bf 109E-4, also of I./JG 27 is camouflaged in quite a different scheme to those illustrated above. Fuselage spine standard green with thin grey dapple, wings and tailplane standard splinter, fuselage sides and engine cowl pale blue with green and grey dapple, red and white spinner, standard white wing tips and fuselage band with in addition a white rudder. Black 4 thinly outlined with red. (R. Ward)

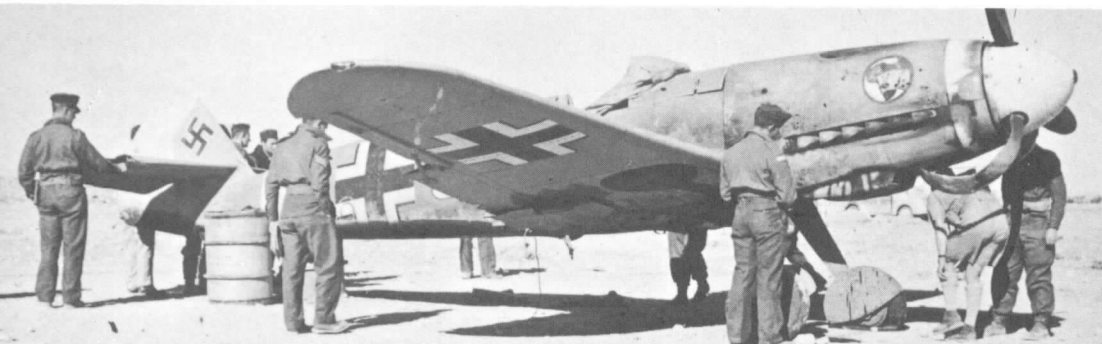


Left: Nose detail of a Bf 109E of 7./JG 27, note spinner cap. (R. Ward)

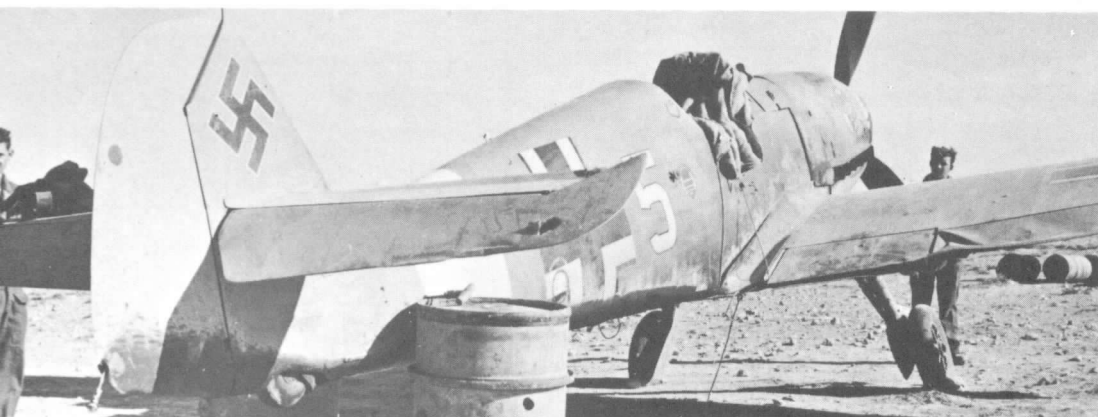




Above : Bf 109F fuselages in a dump in the Western Desert. Note the sparse green mottling on the nearest sand fuselage. (I.W.M.)



Above and below : Bf 109F of I./JG 27. Sand uppersurfaces, pale blue undersurfaces without white wing tips, white spinner, nose band, rudder and fuselage band. White 5 thinly outlined black. (Photos I.W.M.)



Below : Remains of a Bf 109G-1 Trop probably of 2nd Staffel JG 27 crashed on a Tunisian LG. Scheme would probably have been standard splinter camouflage for wings and tail-plane, green fuselage spine, pale blue fuselage sides and engine cowl mottled in grey and blue. White fuselage band only, black spinner. In the last few weeks of the Tunisian Campaign little or no attempt was made to apply the earlier theatre markings on replacement aircraft. (I.W.M.)





II./JG 27



2./JG 27



Above: Nose detail of Bf 109F-1 Trop of II./JG 27 on a Desert LG. The colours of the insignia are: black bear on white shield with red trim. (I.W.M.)



Right: Sand camouflaged Bf 109F-1 Trop of III./JG 27, note white wing-tips on uppersurfaces also.

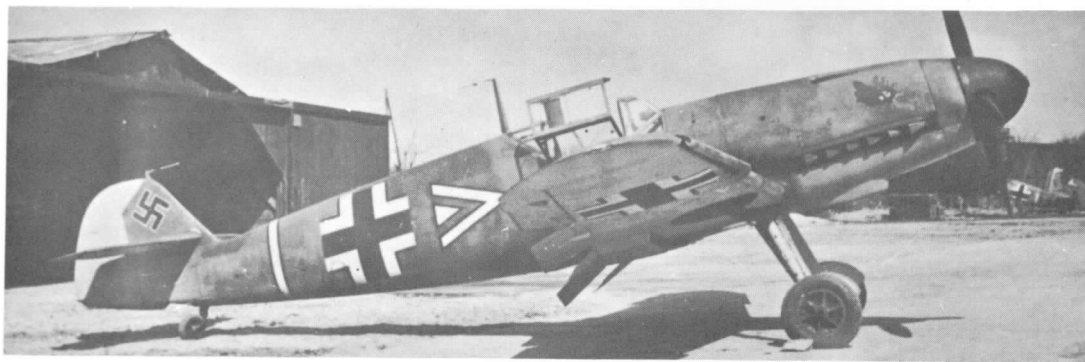
Below: Worn white winter camouflage on a Bf 109G-1 of III./JG 53 'Pik As' in Russia. (R. Ward)



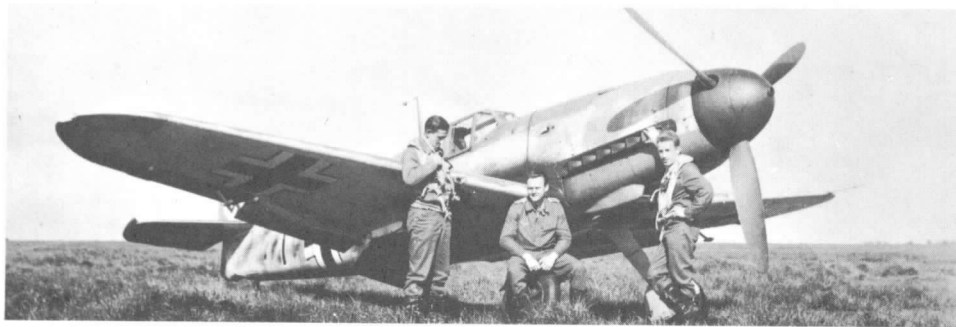


Above: Maj. Hannes Trautloft, Kommandeur JG 54 'Grunherz' standing in front of his Bf 109F-2, Sivaskaya, Russia, winter 1941-42.

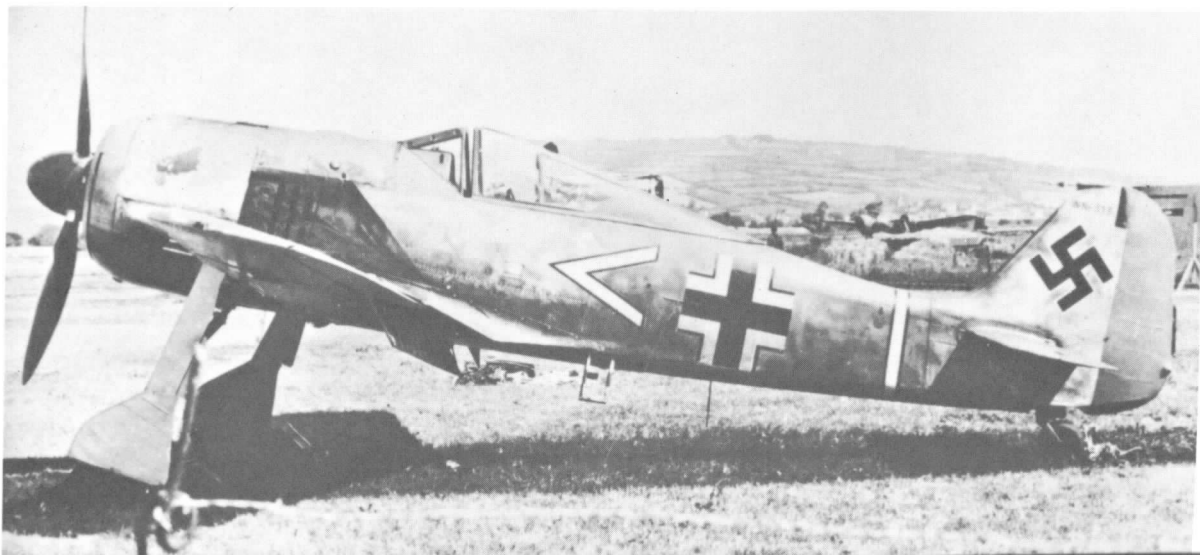
Below: Bf 109F-4 flown by Gruppen Kommandeur of III./JG 2 'Richthofen', France 1941. Scheme as for side-view illustration C6 but with much heavier dapple on fuselage, rudder probably yellow.



Below: Bf 109F of 8./JG 2, scheme as for C6. (Z. Titz)



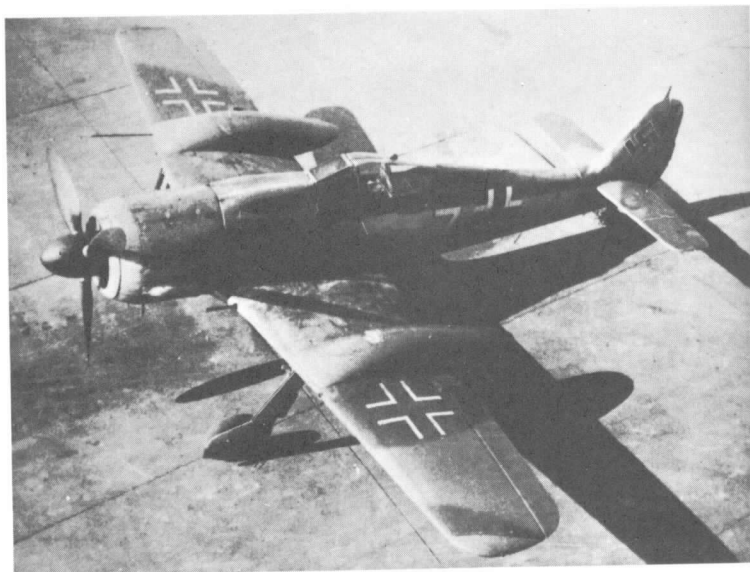
Below: Focke-Wulf Fw 190A-3 of 9/JG 2 'Richthofen' flown by Oblt. Armin Faber, adjutant of III./JG 2. Standard wing and tail-plane uppersurfaces, pale blue fuselage merging into grey with heavy green and grey dapple. Red lower cowl, spinner and rudder. (I.W.M.)







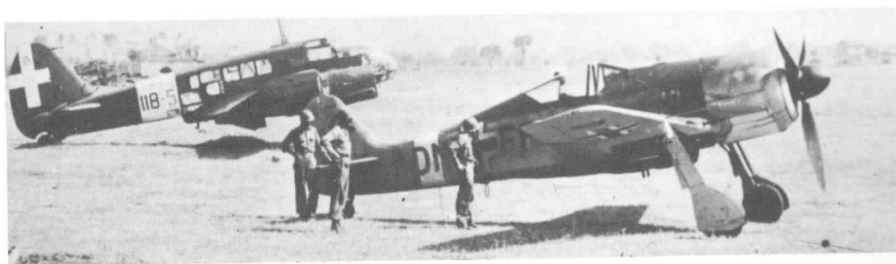
Above: Nose detail of a Fw 190A-5/U3 fighter-bomber of 1./SG 4. (I.W.M.)



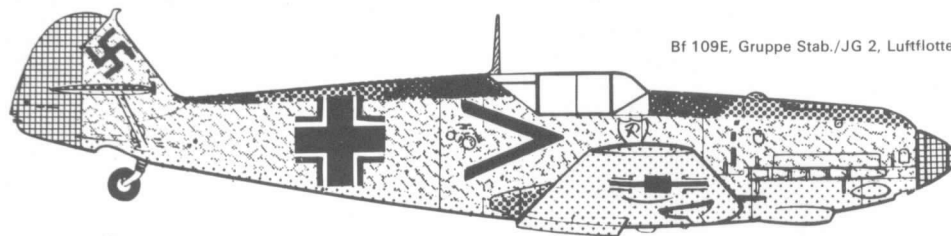
Left: Near plan view photo of a Fw 190A-4 showing camouflage pattern, note experimental long-range tanks.

Below: Note radio call signs on this Fw 190 delivered to front factory fresh and rushed into action. Salerno, Italy 1943.

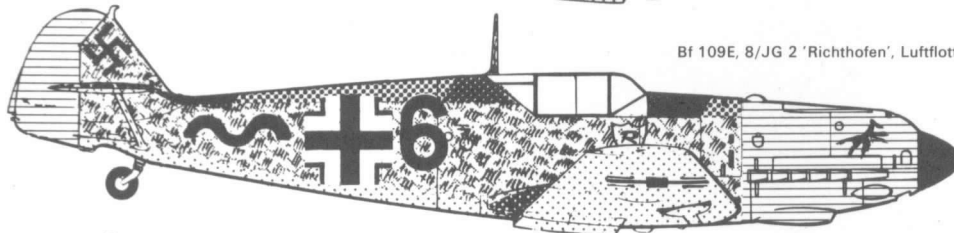
Bottom: Focke-Wulf Fw 190D in standard splinter uppersurfaces, green spine pale blue merging into grey fuselage sides with very heavy green and grey dappling.



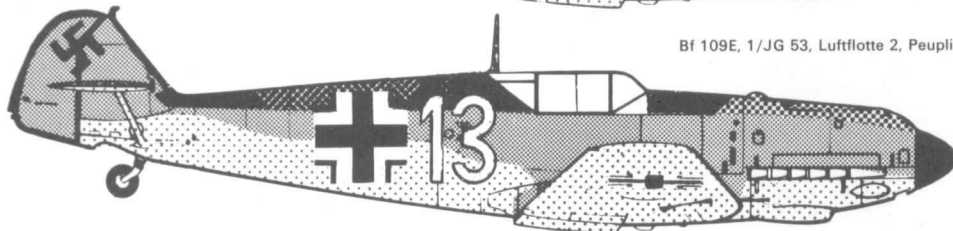
Bf 109E SCHEMES: BATTLE OF BRITAIN PERIOD



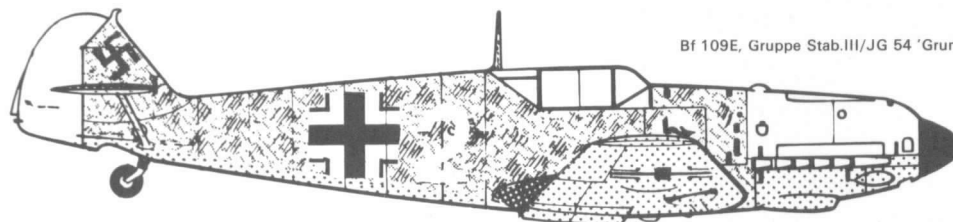
Bf 109E, Gruppe Stab./JG 2, Luftflotte 3, Beaumont-le-Roger, France.



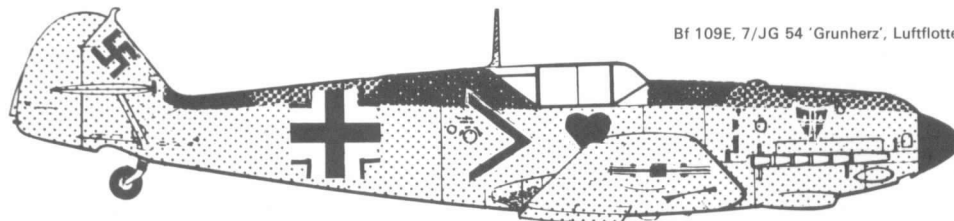
Bf 109E, 8/JG 2 'Richthofen', Luftflotte 3, Le Have, France.



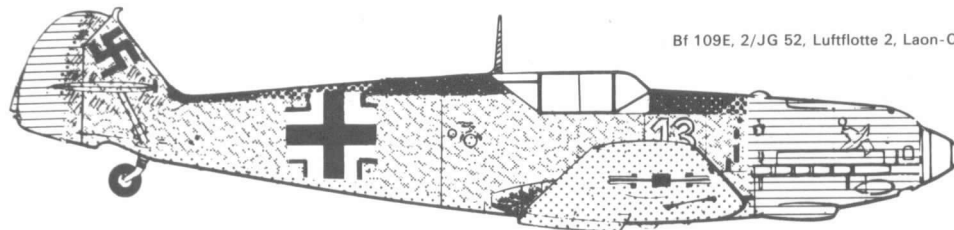
Bf 109E, 1/JG 53, Luftflotte 2, Peuplingne, France.



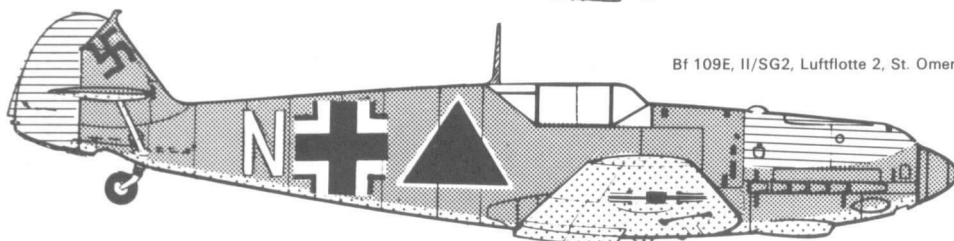
Bf 109E, Gruppe Stab.III/JG 54 'Grunherz', Luftflotte 2, Guines, France.



Bf 109E, 7/JG 54 'Grunherz', Luftflotte 2, Guines, France.

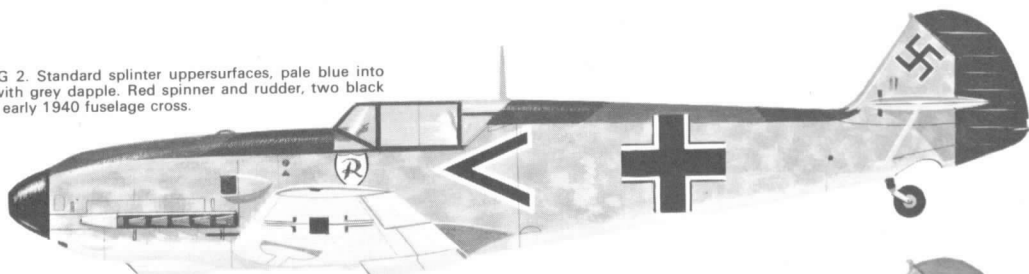


Bf 109E, 2/JG 52, Luftflotte 2, Laon-Couvron, France

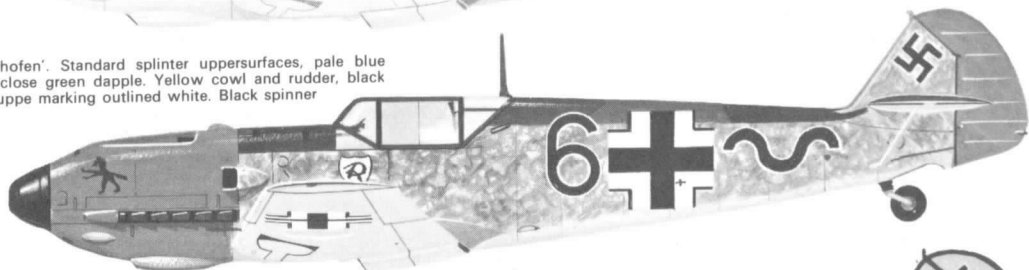


Bf 109E, II/SG2, Luftflotte 2, St. Omer, France.

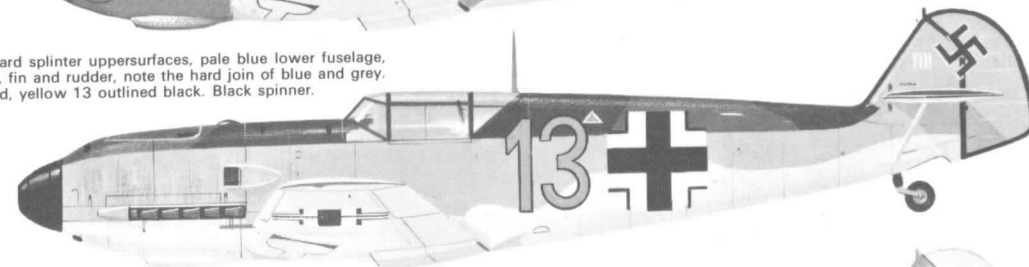
Bf 109E, Gruppe Stab./JG 2. Standard splinter uppersurfaces, pale blue into pale grey fuselage sides with grey dapple. Red spinner and rudder, two black victory marks on fin. Note early 1940 fuselage cross.



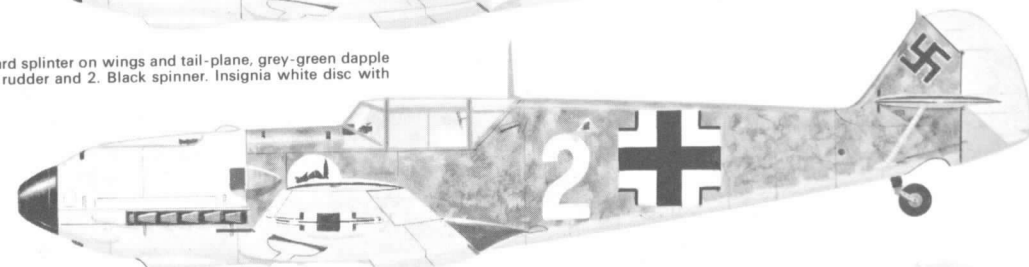
Bf 109E, 8/JG 2 'Richthofen'. Standard splinter uppersurfaces, pale blue fuselage sides with very close green dapple. Yellow cowl and rudder, black spinner. Red 6 and III Gruppe marking outlined white. Black spinner.



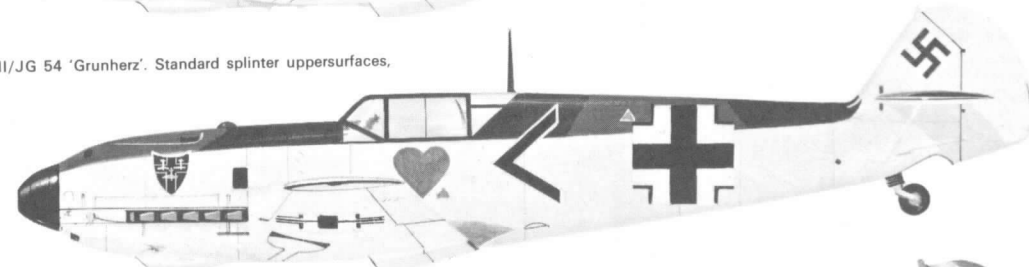
Bf 109E, 1/JG 53. Standard splinter uppersurfaces, pale blue lower fuselage, RLM grey upper fuselage, fin and rudder, note the hard join of blue and grey. Fin and rudder lined in red, yellow 13 outlined black. Black spinner.



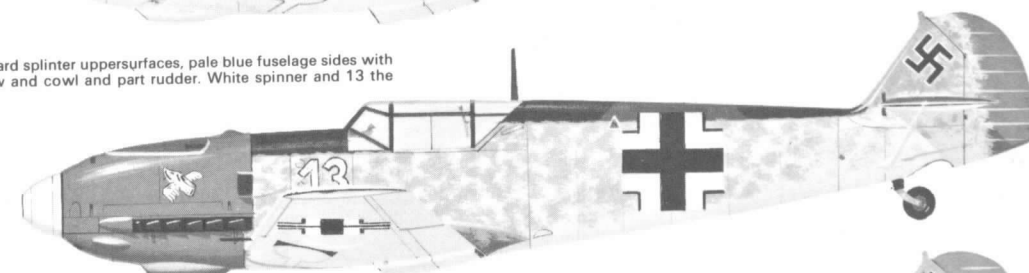
Bf 109E, 2/JG 52. Standard splinter on wings and tail-plane, grey-green dapple on fuselage. White cowl, rudder and 2. Black spinner. Insignia white disc with red cat.



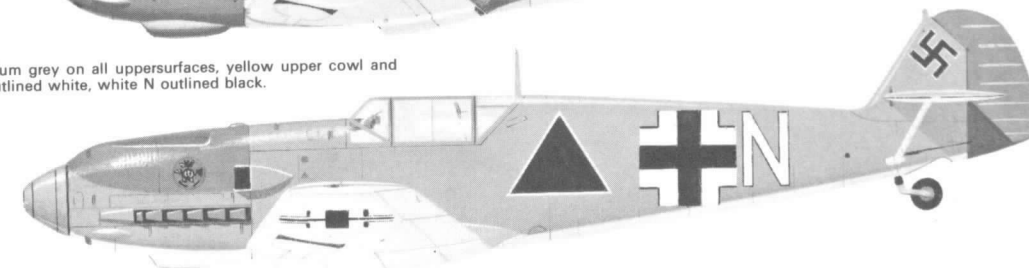
Bf 109E, Gruppe Stab. III/JG 54 'Grunherz'. Standard splinter uppersurfaces, pale blue fuselage sides.



Bf 109E, 7/JG 54. Standard splinter uppersurfaces, pale blue fuselage sides with open grey dapple. Yellow cowl and part rudder. White spinner and 13 the latter outlined black.

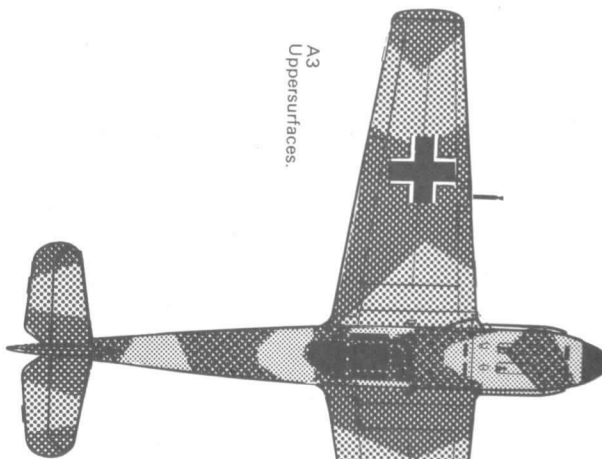


Bf 109E, II/SG 2. Medium grey on all uppersurfaces, yellow upper cowl and rudder, Black triangle outlined white, white N outlined black.

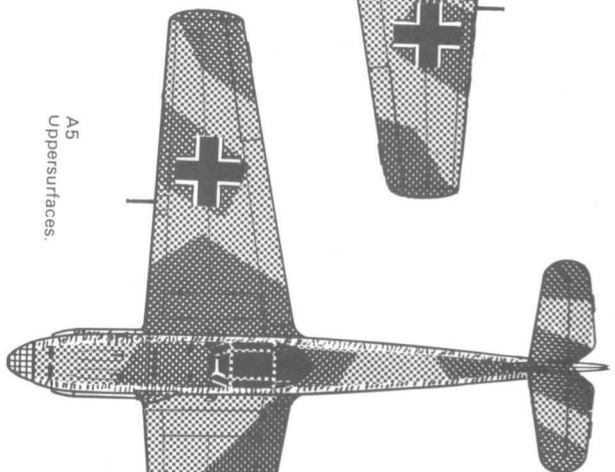




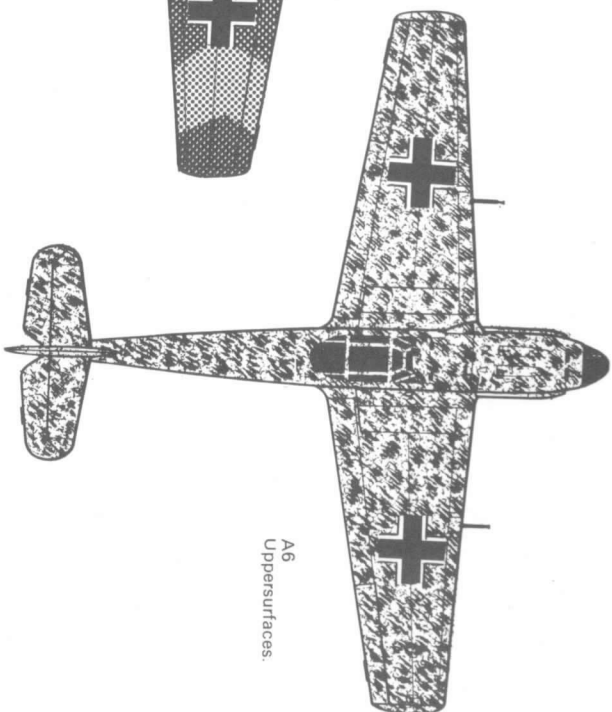
A3  
Uppersurfaces.



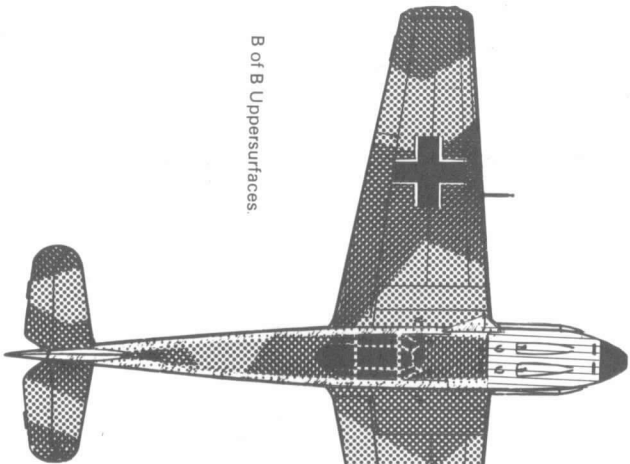
A5  
Uppersurfaces.



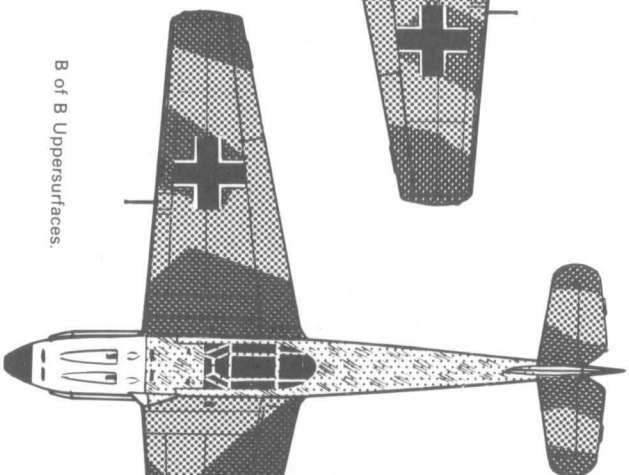
A6  
Uppersurfaces.



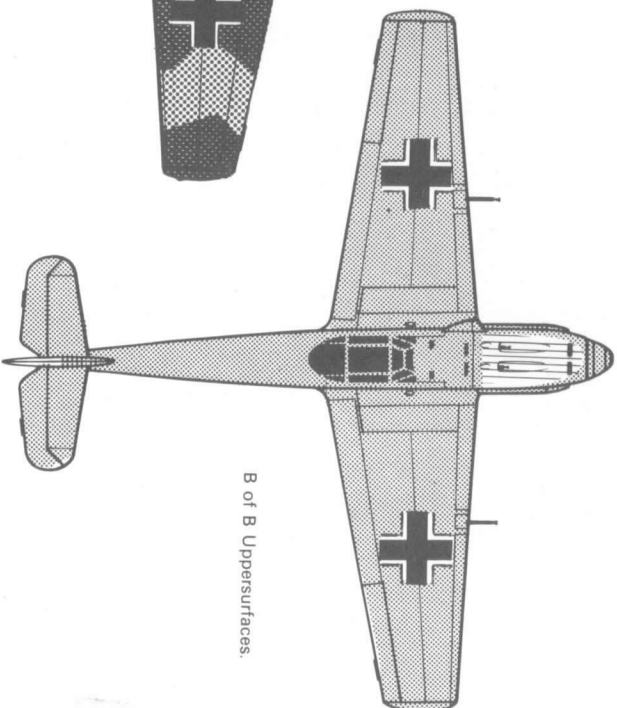
B of B Uppersurfaces.



B of B Uppersurfaces.

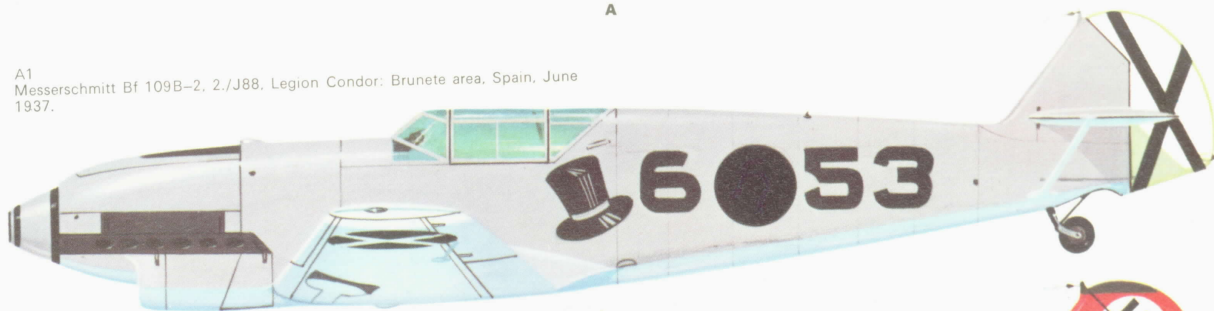


B of B Uppersurfaces.



A

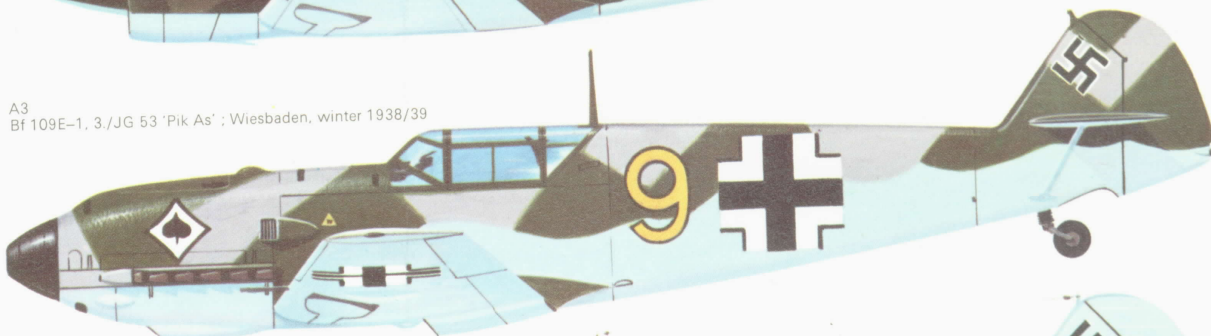
A1  
Messerschmitt Bf 109B-2, 2./J88, Legion Condor; Brunete area, Spain, June 1937.



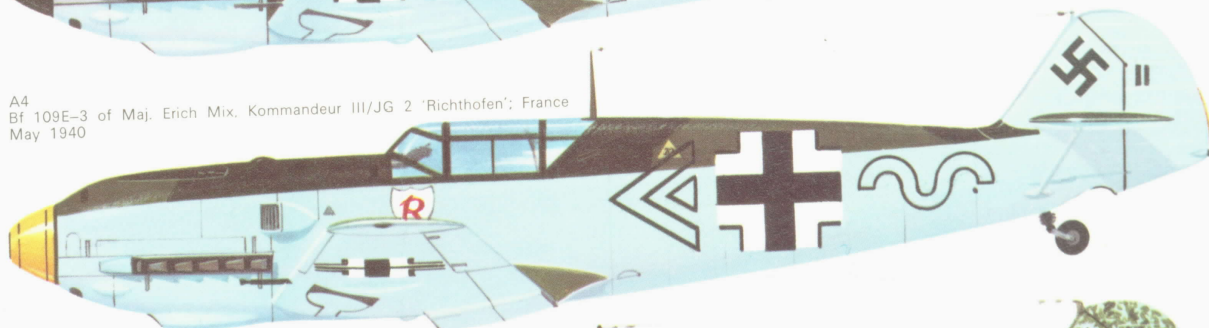
A2  
Bf 109C-2, 1./JG 132 'Richthofen'; Karlsbad, Czechoslovakia, October 1938



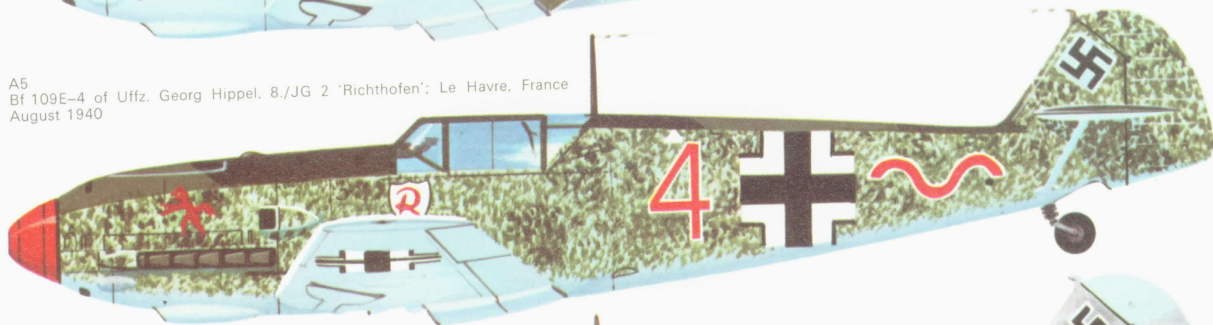
A3  
Bf 109E-1, 3./JG 53 'Pik As'; Wiesbaden, winter 1938/39



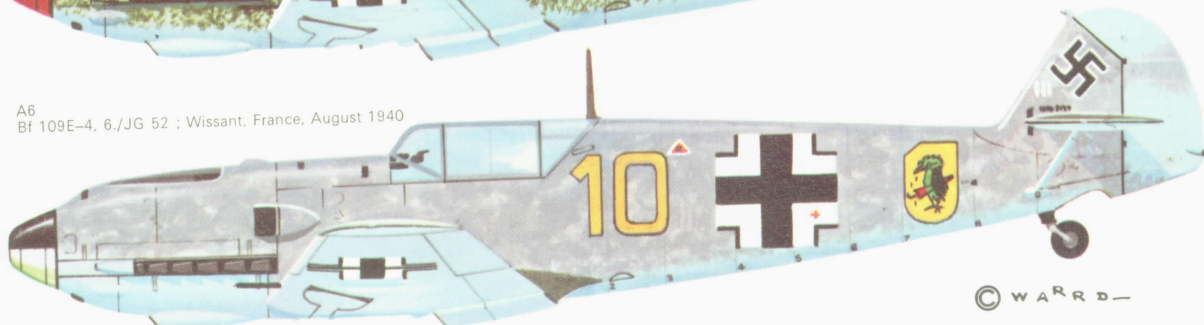
A4  
Bf 109E-3 of Maj. Erich Mix, Kommandeur III/JG 2 'Richthofen'; France May 1940



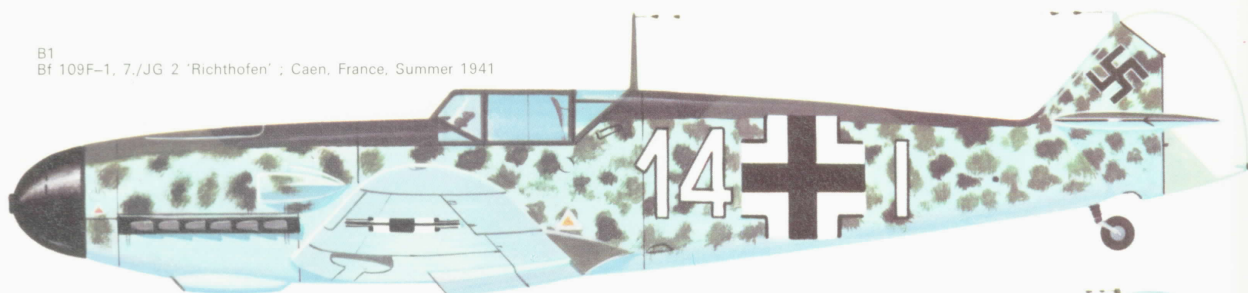
A5  
Bf 109E-4 of Uffz. Georg Hippel, 8./JG 2 'Richthofen'; Le Havre, France August 1940



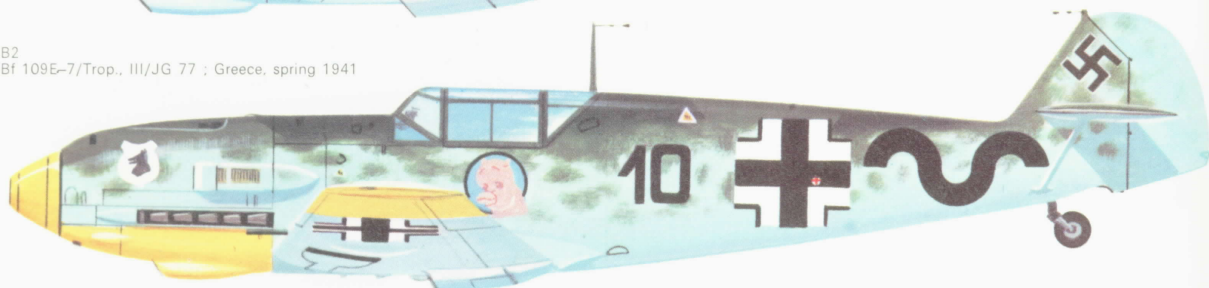
A6  
Bf 109E-4, 6./JG 52; Wissant, France, August 1940



B1  
Bf 109F-1, 7./JG 2 'Richthofen'; Caen, France, Summer 1941



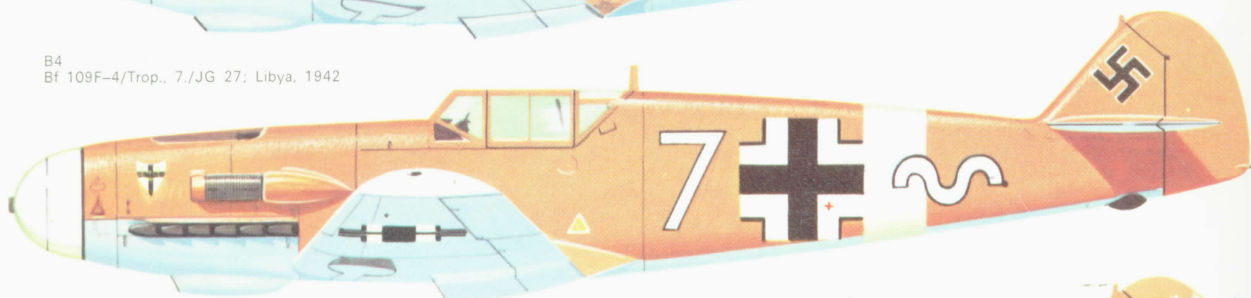
B2  
Bf 109E-7/Trop., III/JG 77; Greece, spring 1941



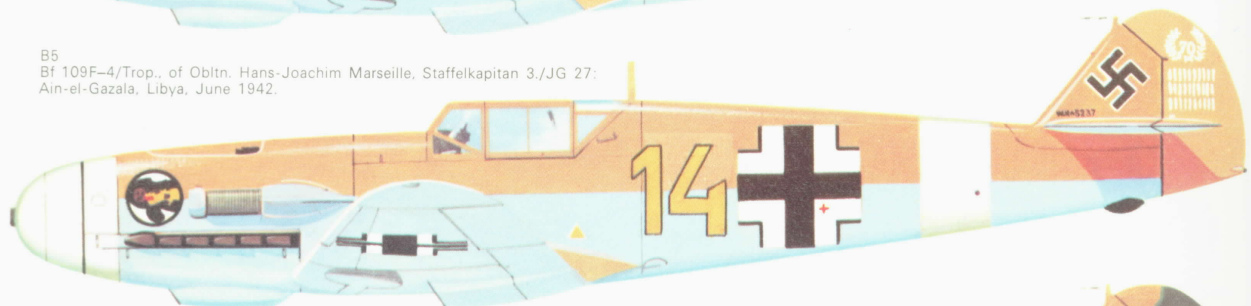
B3  
Bf 109E-4(N)/Trop., I/JG 27; Derna, Libya, summer 1941



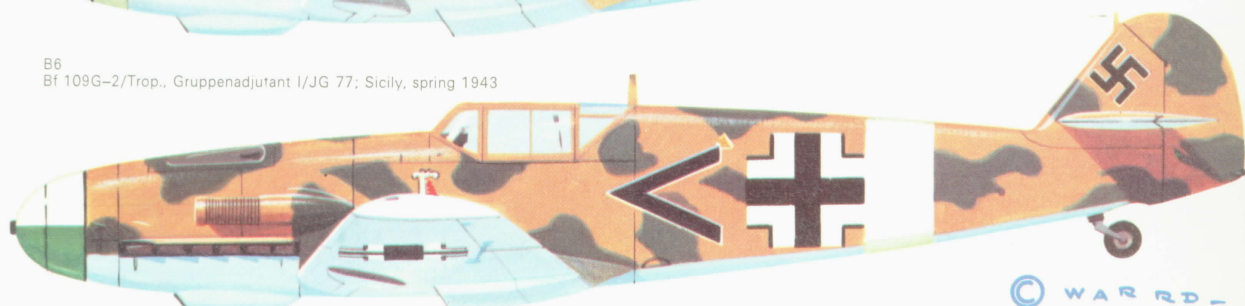
B4  
Bf 109F-4/Trop., 7./JG 27; Libya, 1942



B5  
Bf 109F-4/Trop., of Obltn. Hans-Joachim Marseille, Staffelkapitan 3./JG 27;  
Ain-el-Gazala, Libya, June 1942.



B6  
Bf 109G-2/Trop., Gruppenadjutant I/JG 77; Sicily, spring 1943



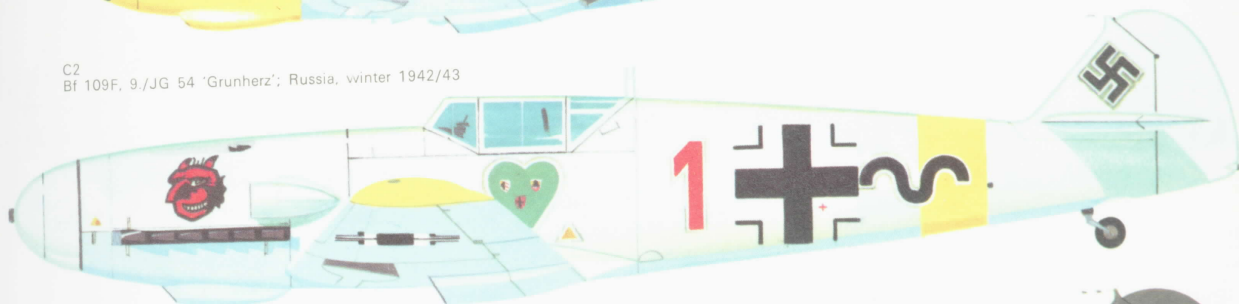


C

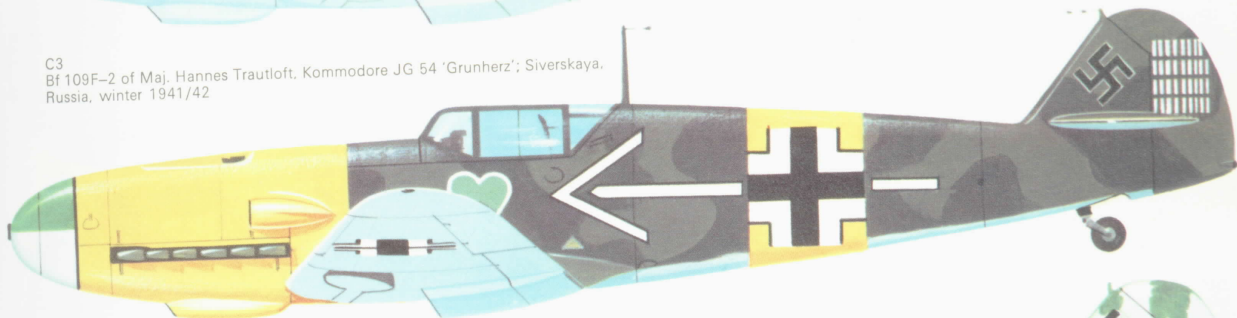
C1  
Bf 109E-4(N), 6./JG 54 'Grunherz'; Russia, autumn 1941



C2  
Bf 109F, 9./JG 54 'Grunherz'; Russia, winter 1942/43



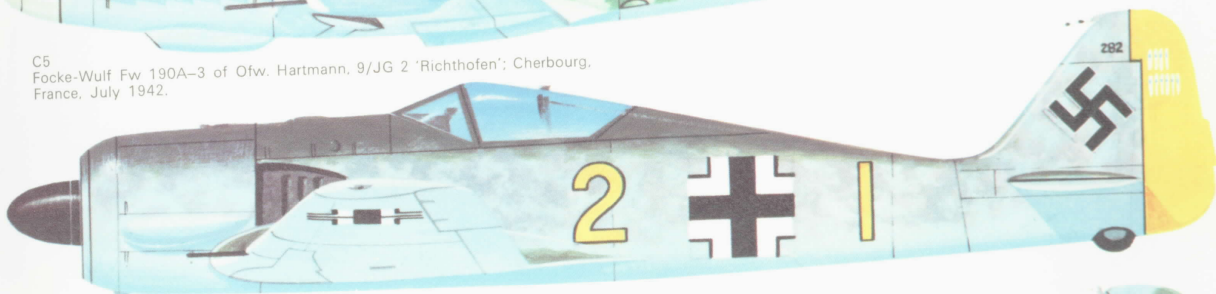
C3  
Bf 109F-2 of Maj. Hannes Trautloft, Kommodore JG 54 'Grunherz'; Siverskaya, Russia, winter 1941/42



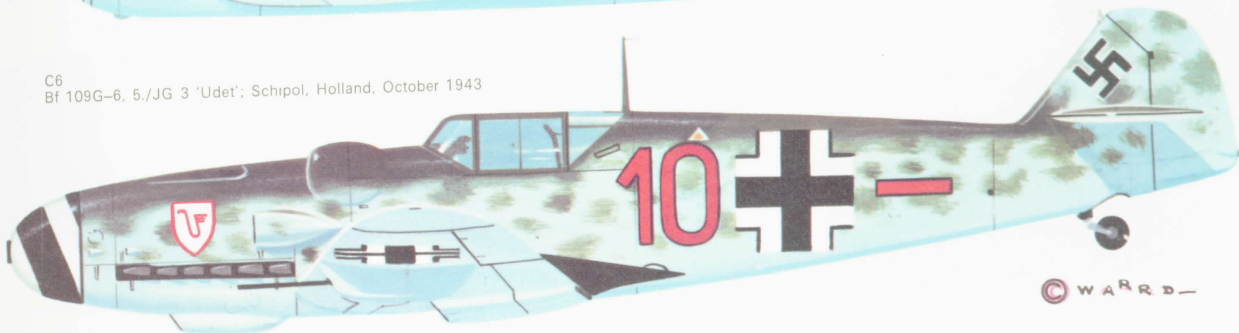
C4  
Bf 109G-6, 12./JG 5 'Eismeer'; Petsamo, Finland, spring 1943



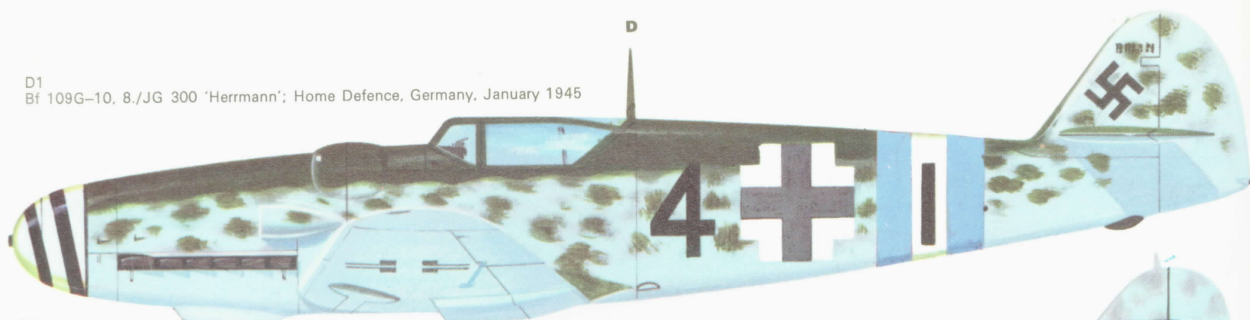
C5  
Focke-Wulf Fw 190A-3 of Ofw. Hartmann, 9/JG 2 'Richthofen'; Cherbourg, France, July 1942.



C6  
Bf 109G-6, 5./JG 3 'Udet'; Schiphol, Holland, October 1943



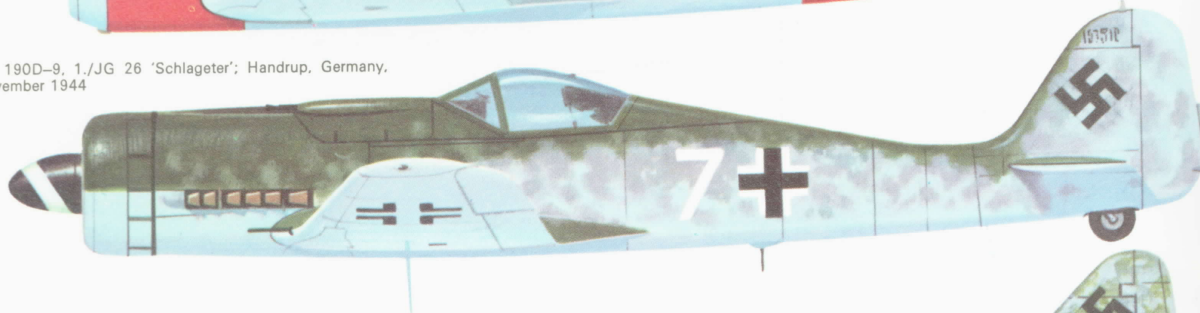
D1  
Bf 109G-10, 8./JG 300 'Herrmann'; Home Defence, Germany, January 1945



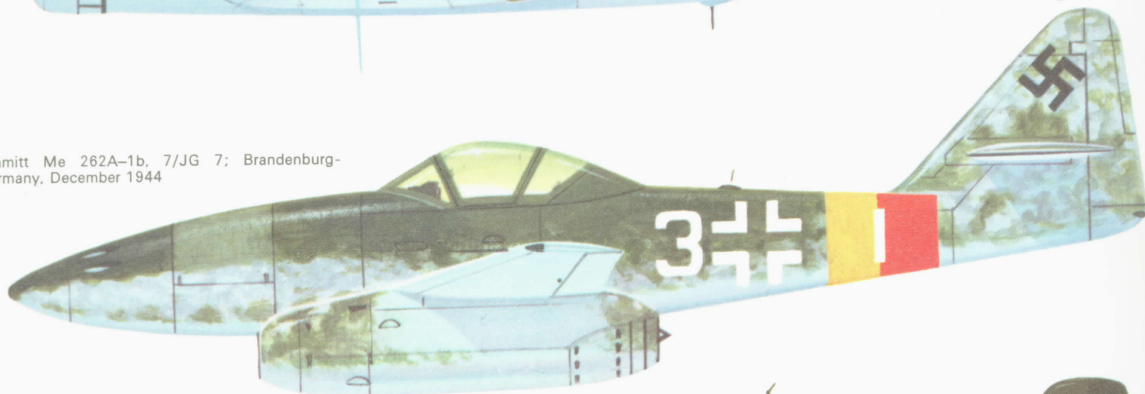
D2  
Fw 190A-8 of Obltn. Klaus Bretschneider, Staffelkapitan  
5./JG 300 'Herrmann'; Home Defence, Germany, October  
1944



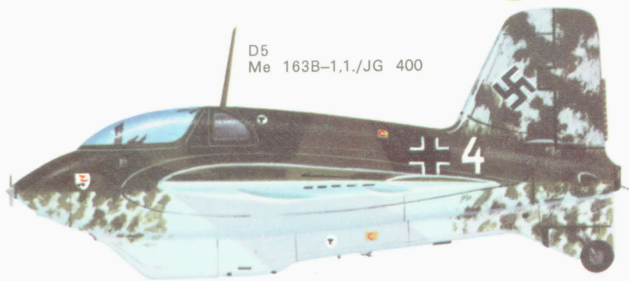
D3  
Fw 190D-9, 1./JG 26 'Schlageter'; Handrup, Germany,  
November 1944



D4  
Messerschmitt Me 262A-1b, 7/JG 7; Brandenburg-  
Briest, Germany, December 1944



D5  
Me 163B-1, 1./JG 400



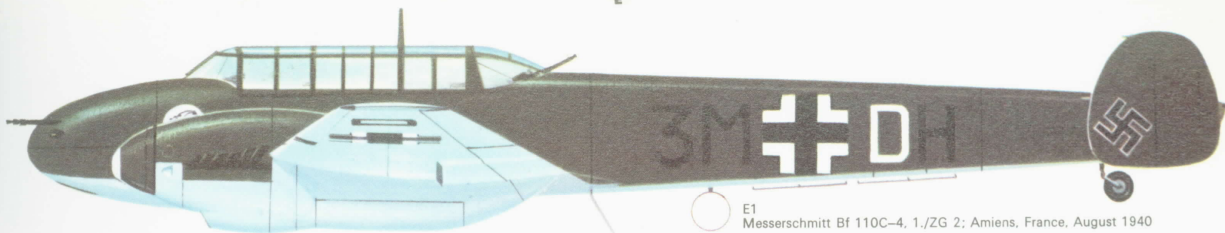
D6  
Messerschmitt Me 163B-1,  
2./JG 400; Brandis, Germany  
July 1944



D7  
Heinkel He 162A-2 of Obltn. Demuth, Staffelkapitan  
3./JG 1; Leck, Germany, April 1945







E1  
Messerschmitt Bf 110C-4, 1./ZG 2; Amiens, France, August 1940



E2  
Bf 110C-4(B), 2./E.Gr.210; Calais, France, August 1940



E3  
Bf 110E-1, Staff III/ZG 26 'Horst Wessel'; Sirte, Libya, 1942

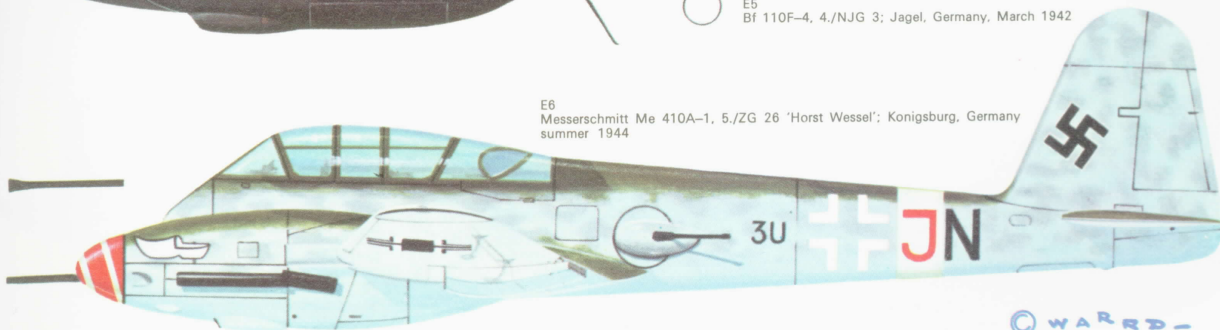


E4  
Bf 110D, Staff II/ZG 1 'Westpen'; Russia, winter 1941/42

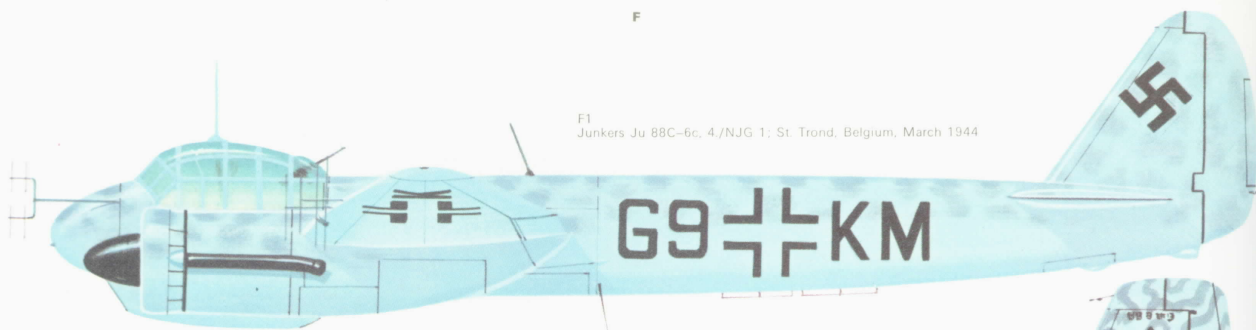


E5  
Bf 110F-4, 4./NJG 3; Jagel, Germany, March 1942

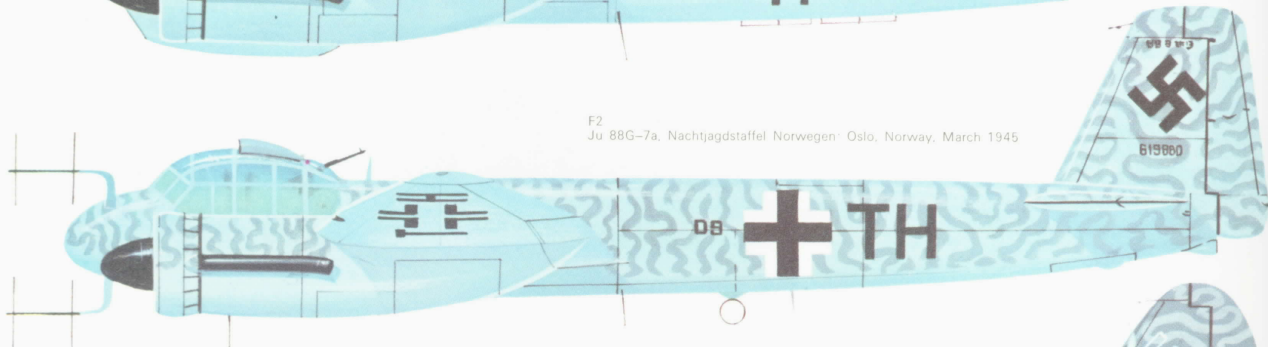
E6  
Messerschmitt Me 410A-1, 5./ZG 26 'Horst Wessel'; Königsburg, Germany  
summer 1944



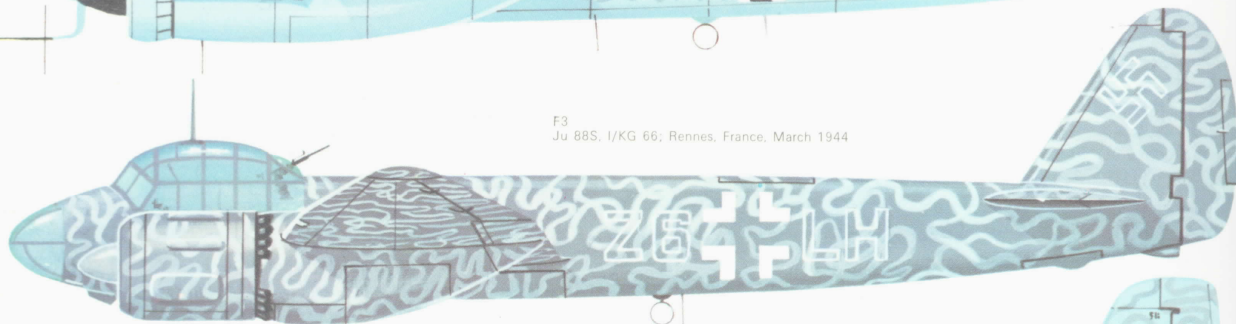
F



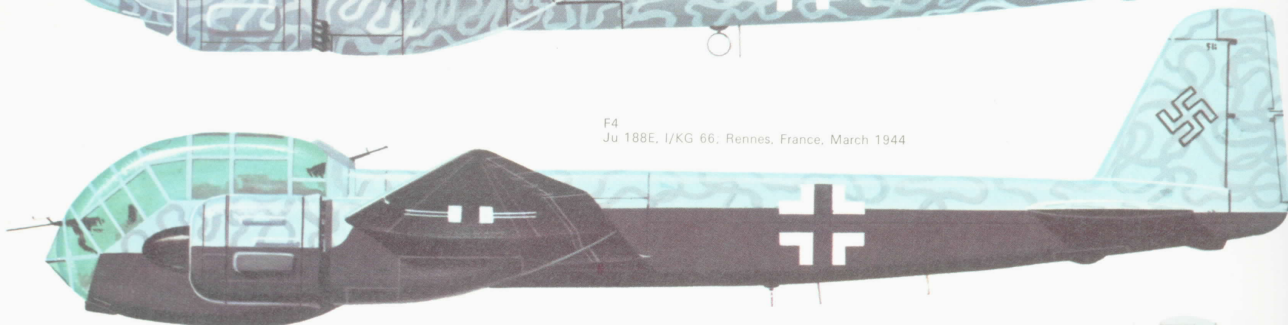
F1  
Junkers Ju 88C-6c, 4./NJG 1; St. Trond, Belgium, March 1944



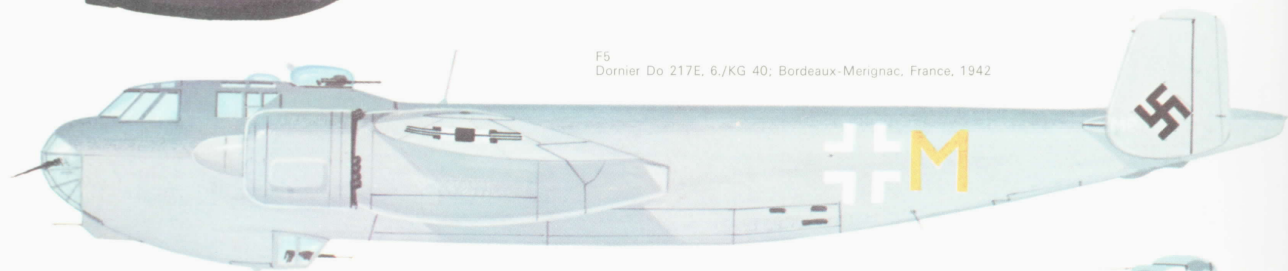
F2  
Ju 88G-7a, Nachtjagdstaffel Norwegen; Oslo, Norway, March 1945



F3  
Ju 88S, I/KG 66; Rennes, France, March 1944



F4  
Ju 188E, I/KG 66; Rennes, France, March 1944



F5  
Dornier Do 217E, 6./KG 40; Bordeaux-Mérignac, France, 1942



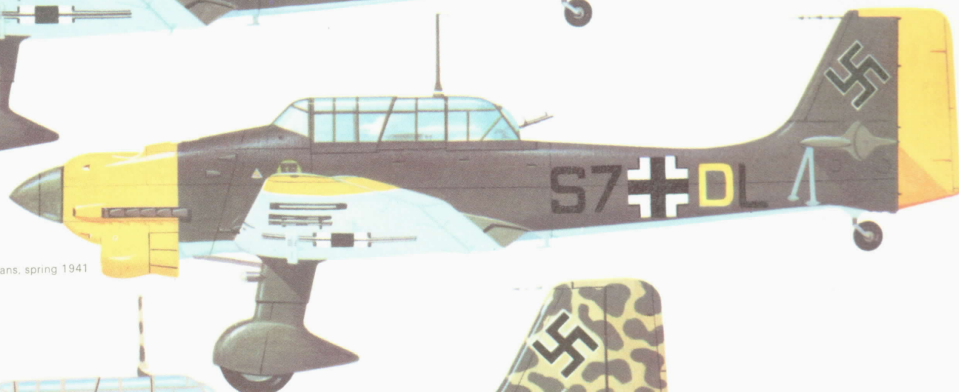
F6  
Do 217M, 2./KG 2 'Holzhammer'; probably Gilze-Rijen, Holland, winter 1943/44



G



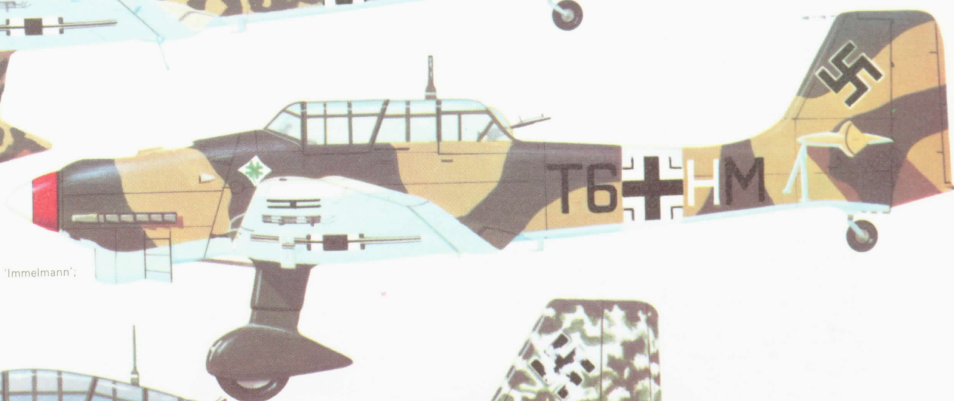
G1  
Junkers Ju 87R, 5/St.G 1 (previously  
8/St.G 51); Pas de Calais, France, July 1940



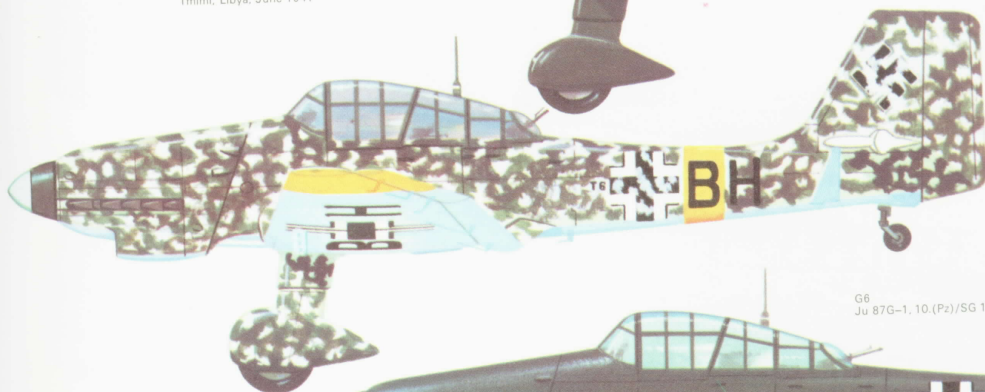
G2  
Ju 87B-2, 3/St.G 3; Balkans, spring 1941



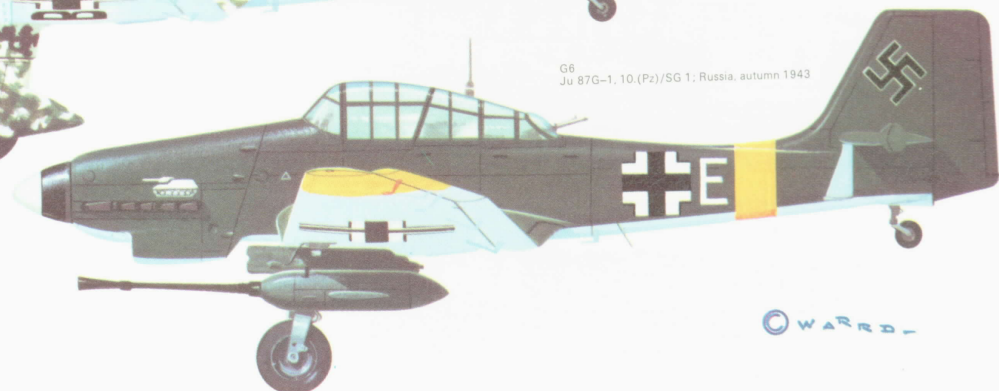
G3  
Ju 87B-2/Trop., 1/St.G 1; Derna, Libya,  
August 1941



G4  
Ju 87B-2/Trop., 4/St.G 2 'Immelmann';  
Tmimi, Libya, June 1941



G5  
Ju 87D-3, 1/St.G 2 'Immelmann'; Russia,  
winter 1943/44



G6  
Ju 87G-1, 10.(Pz)/SG 1; Russia, autumn 1943

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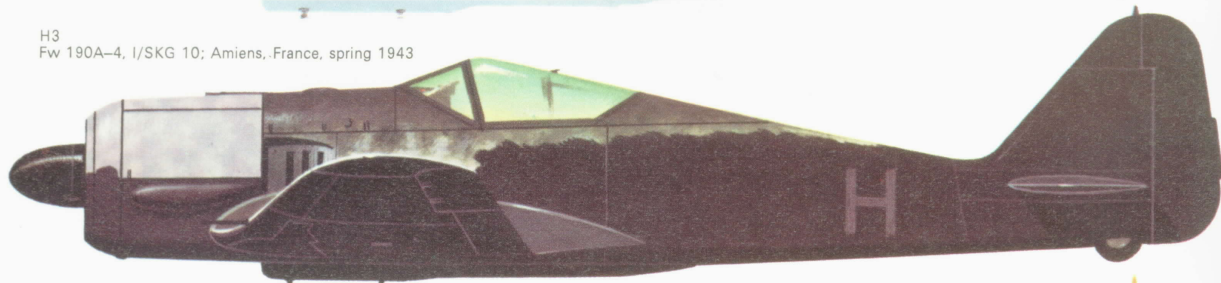
H1  
Bf 109E-4 (B), 8./SKG 210; El Daba, Egypt, October 1942



H2  
Fw 190A-4, I./SKG 10; Amiens France, spring 1943



H3  
Fw 190A-4, I./SKG 10; Amiens, France, spring 1943



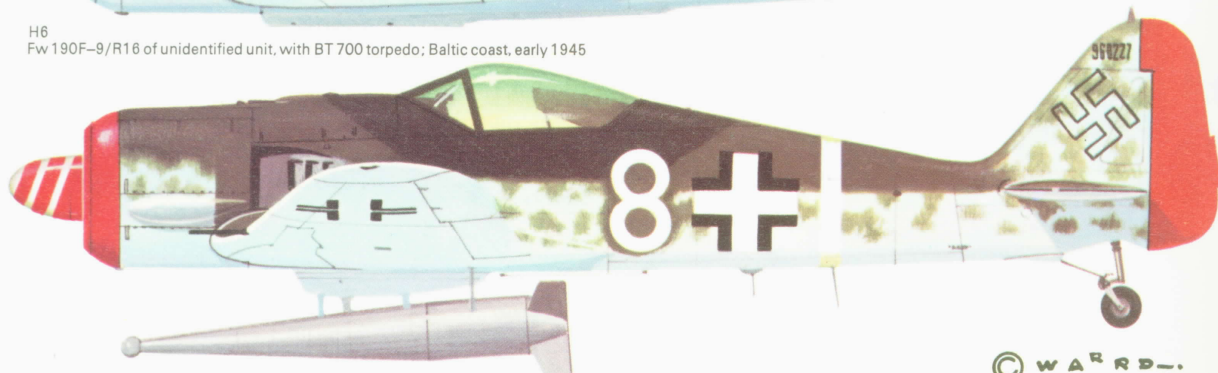
H4  
Fw 190F-7, 1./SG 4; Sardinia, spring 1944

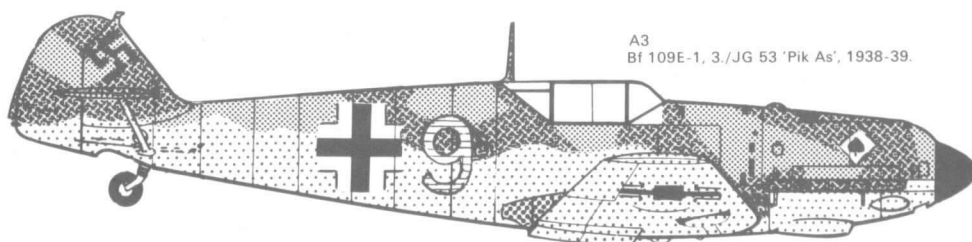


H5  
Fw 190F-8, 2./SG 2 'Immelmann'; Hungary, winter 1944/45

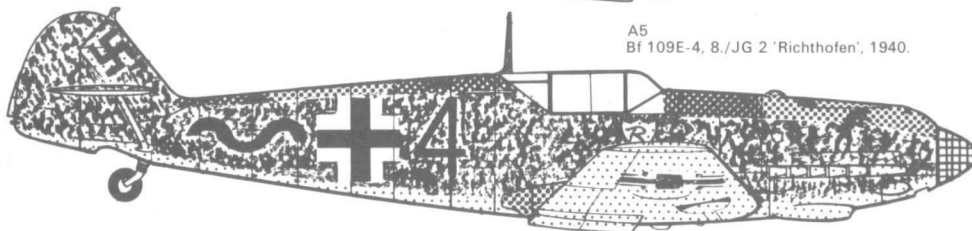


H6  
Fw 190F-9/R16 of unidentified unit, with BT 700 torpedo; Baltic coast, early 1945

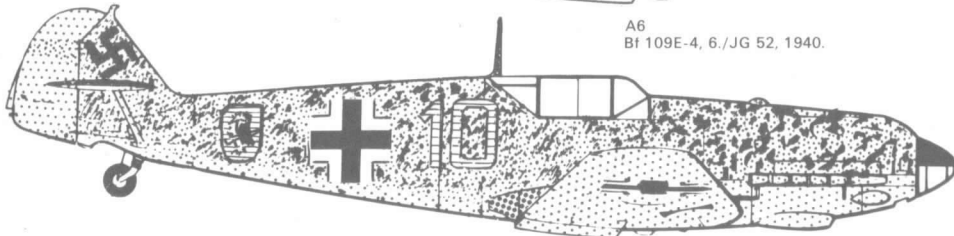




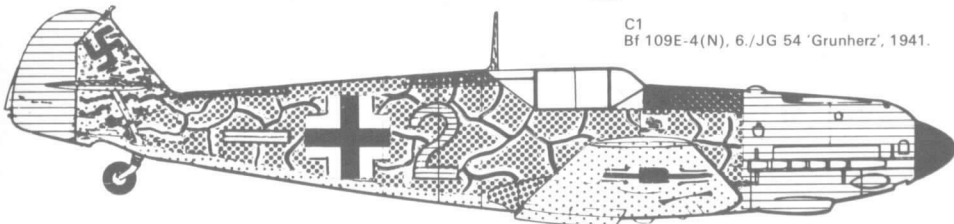
A3  
Bf 109E-1, 3./JG 53 'Pik As', 1938-39.



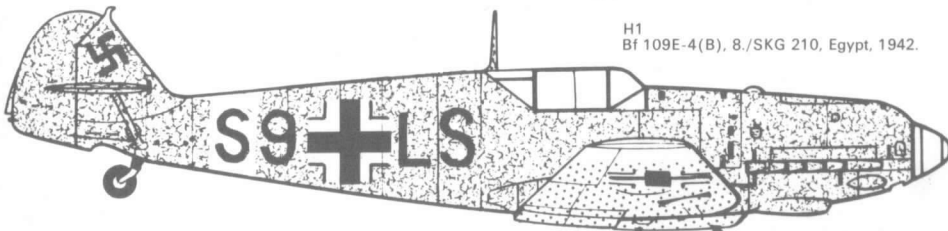
A5  
Bf 109E-4, 8./JG 2 'Richthofen', 1940.



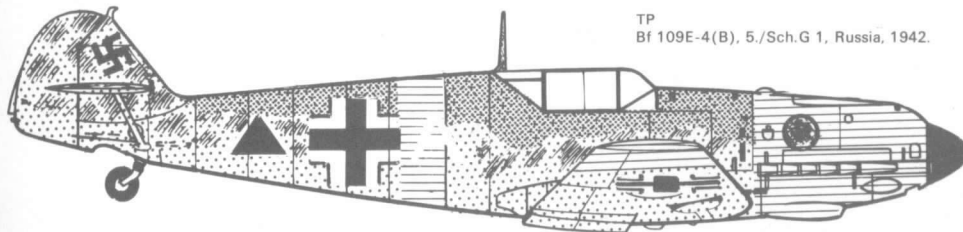
A6  
Bf 109E-4, 6./JG 52, 1940.



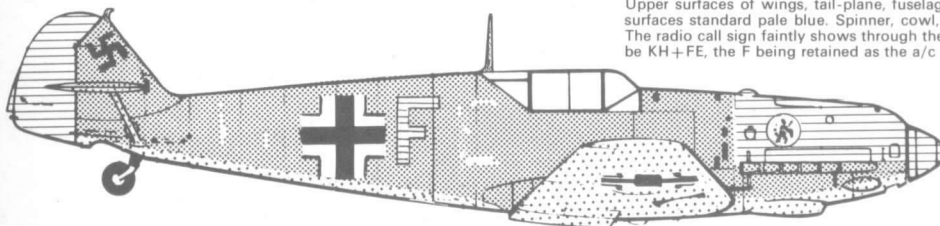
C1  
Bf 109E-4(N), 6./JG 54 'Grunherz', 1941.



H1  
Bf 109E-4(B), 8./SKG 210, Egypt, 1942.

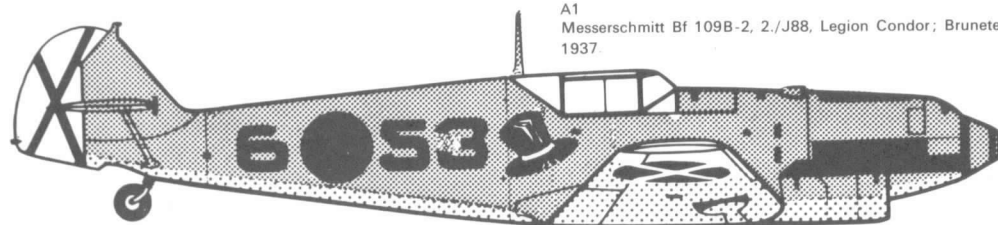


TP  
Bf 109E-4(B), 5./Sch.G 1, Russia, 1942.

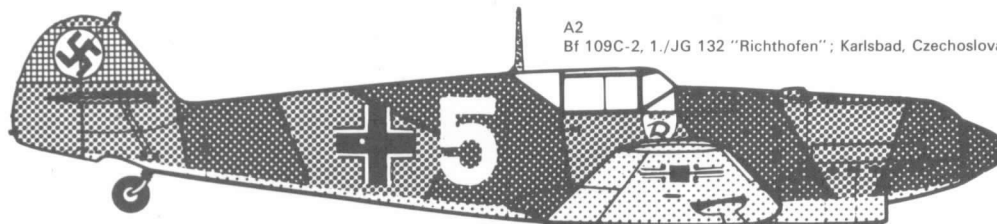


Bf 109E-4(B), 6.II.(S)/LG 2, Luftflotte 2, St. Omer, France 1940.  
Upper surfaces of wings, tail-plane, fuselage and rudder medium grey, under-surfaces standard pale blue. Spinner, cowl, rudder and aircraft letter F yellow. The radio call sign faintly shows through the grey fuselage paint and appears to be KH+FE, the F being retained as the a/c letter.

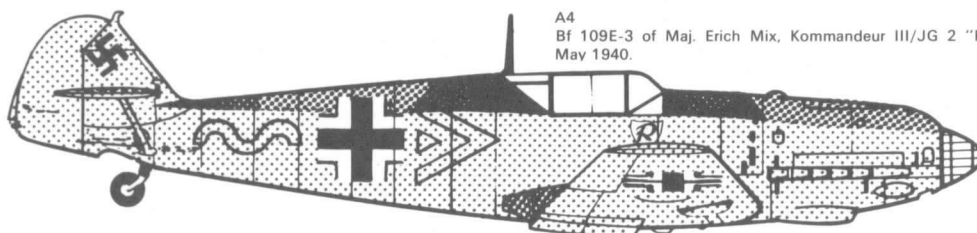




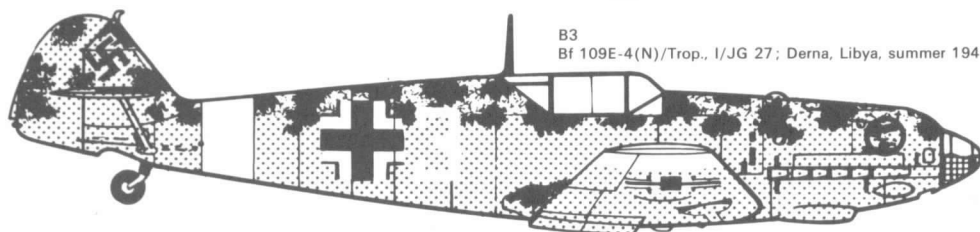
A1  
Messerschmitt Bf 109B-2, 2./J88, Legion Condor; Brunete area, Spain, June 1937.



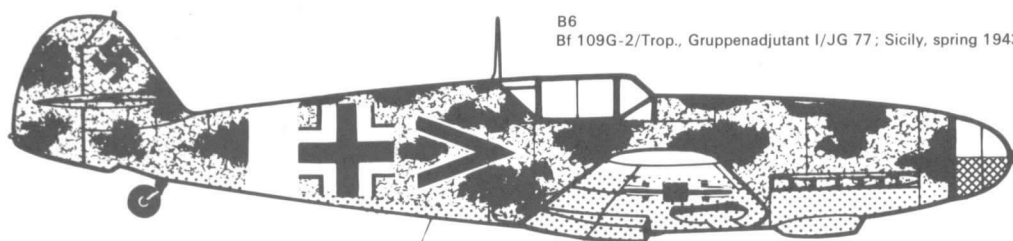
A2  
Bf 109C-2, 1./JG 132 "Richthofen"; Karlsbad, Czechoslovakia, October 1938.



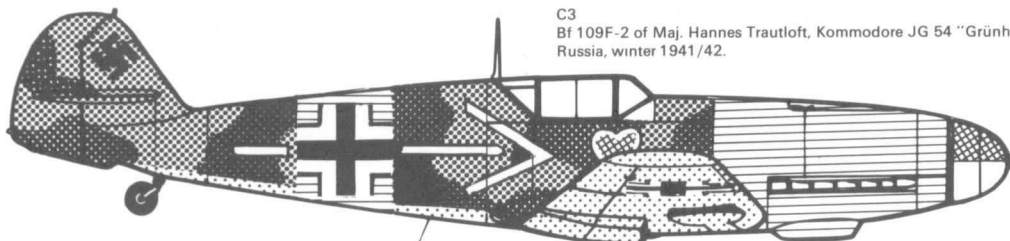
A4  
Bf 109E-3 of Maj. Erich Mix, Kommandeur III/JG 2 "Richthofen"; France, May 1940.



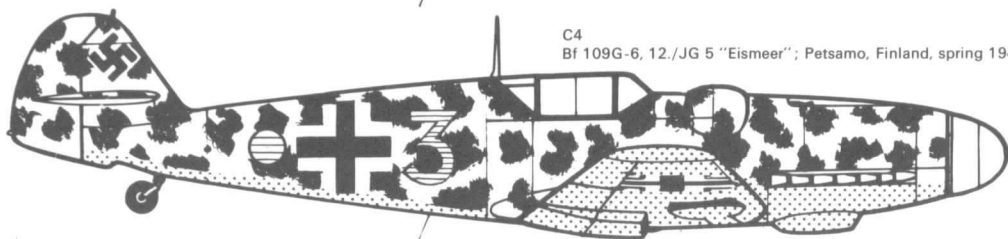
B3  
Bf 109E-4(N)/Trop., I/JG 27; Derna, Libya, summer 1941.



B6  
Bf 109G-2/Trop., Gruppenadjutant I/JG 77; Sicily, spring 1943.



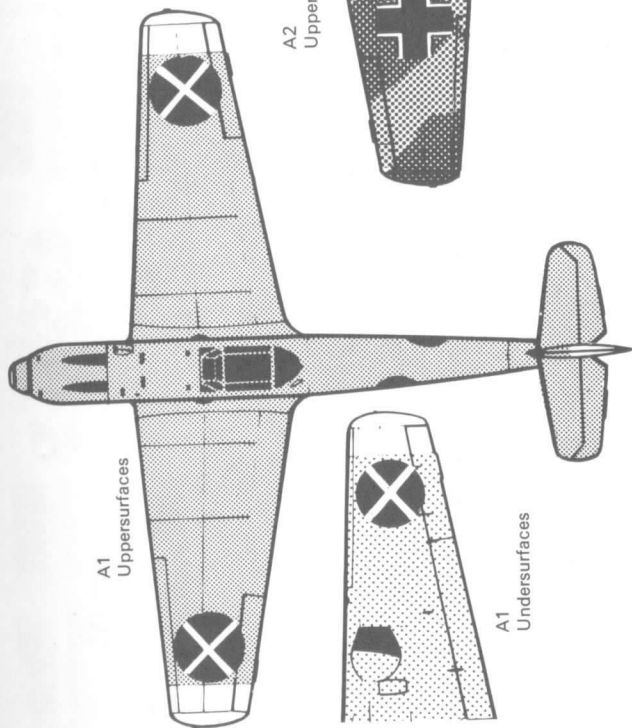
C3  
Bf 109F-2 of Maj. Hannes Trautloft, Kommodore JG 54 "Grünherz"; Siverskaya, Russia, winter 1941/42.



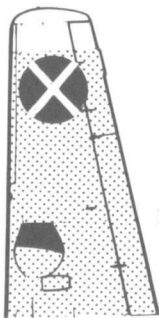
C4  
Bf 109G-6, 12./JG 5 "Eismeer"; Petsamo, Finland, spring 1943.



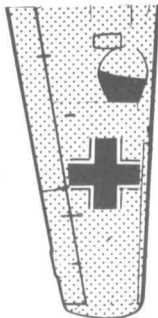
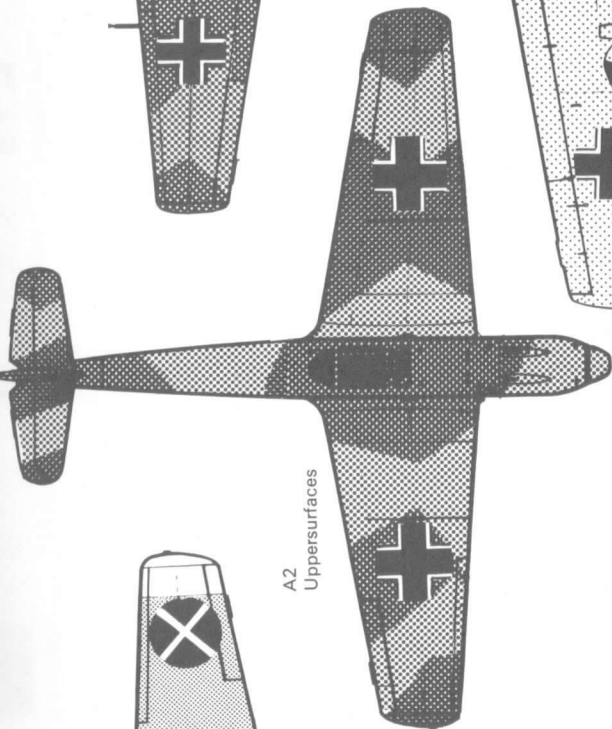
A1  
Uppersurfaces



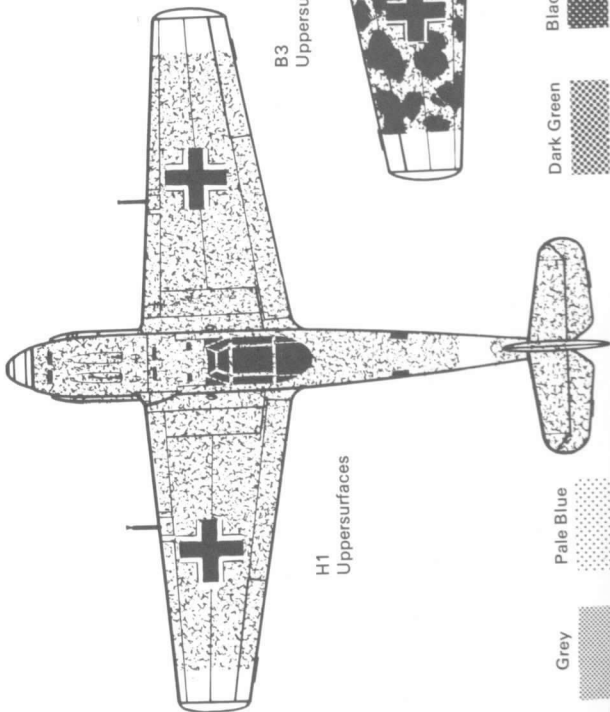
A1  
Undersurfaces



A2  
Uppersurfaces



H1  
Uppersurfaces



Grey



Pale Blue



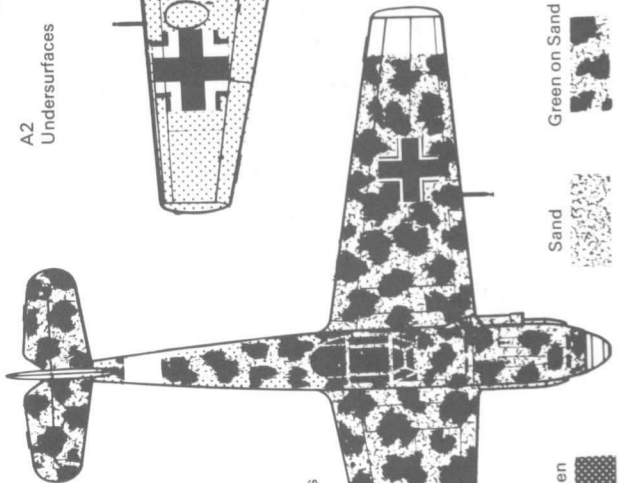
Dark Green



Black Green



B3  
Uppersurfaces



Sand



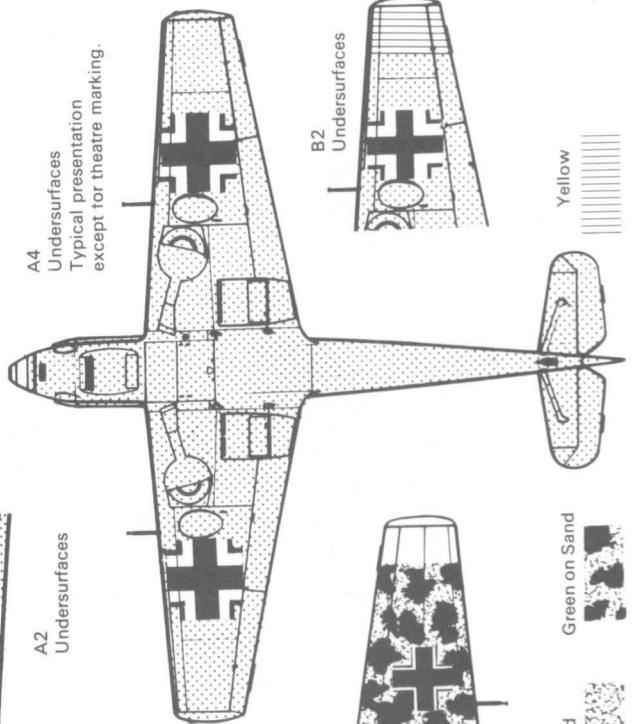
Green on Sand



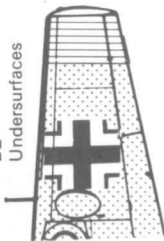
A2  
Undersurfaces



A4  
Undersurfaces  
Typical presentation  
except for theatre marking.



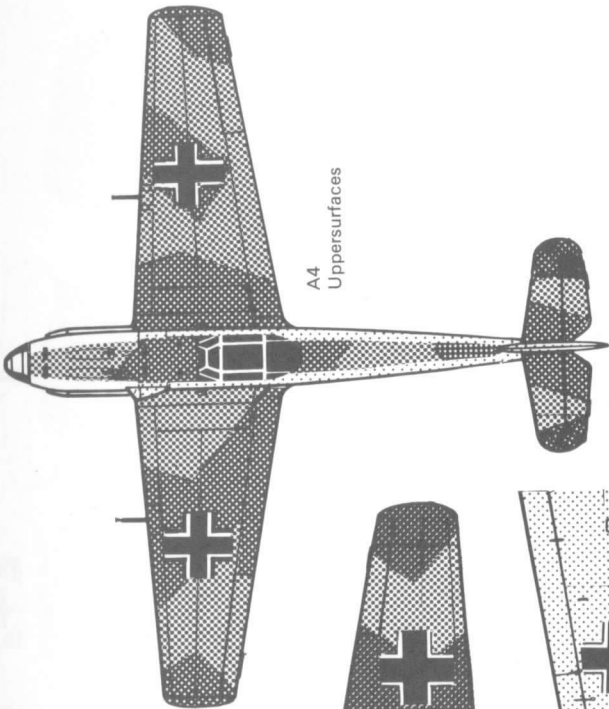
B2  
Undersurfaces



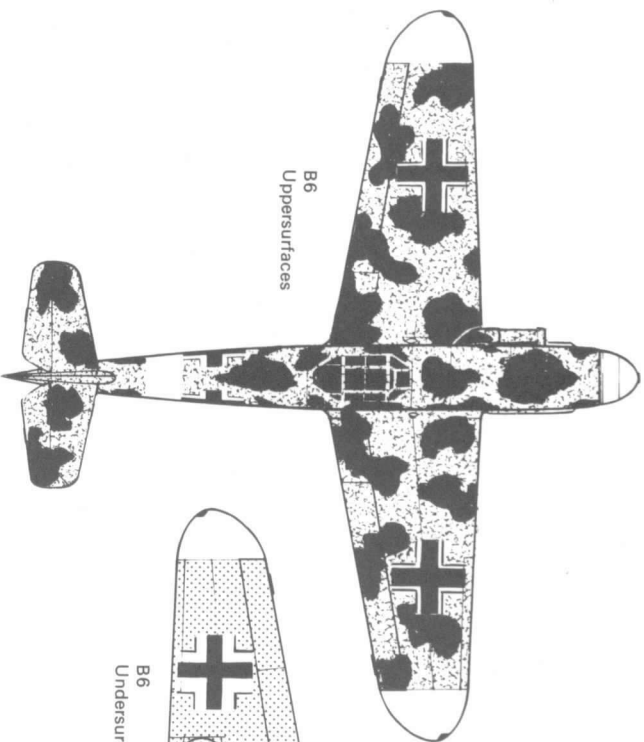
Yellow



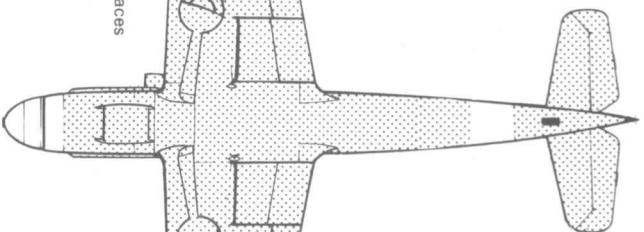
A4  
Uppersurfaces



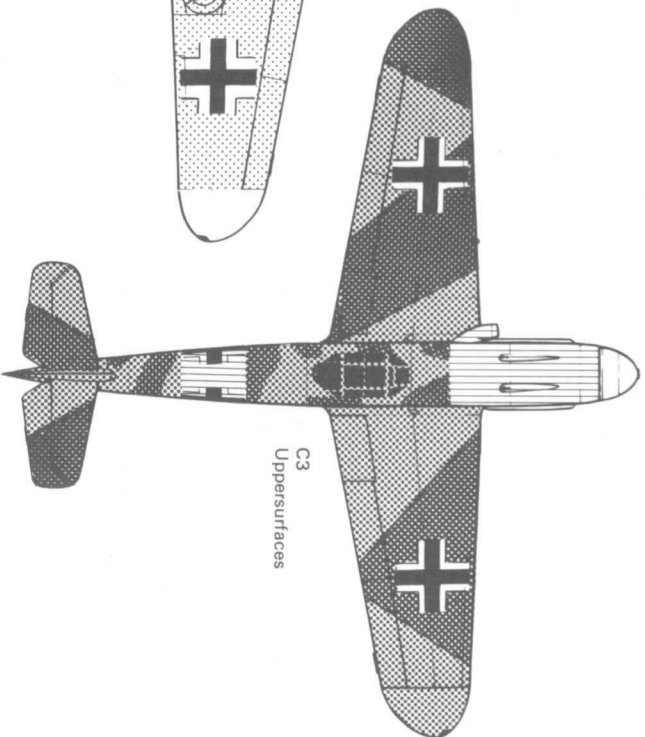
B6  
Uppersurfaces



B6  
Undersurfaces

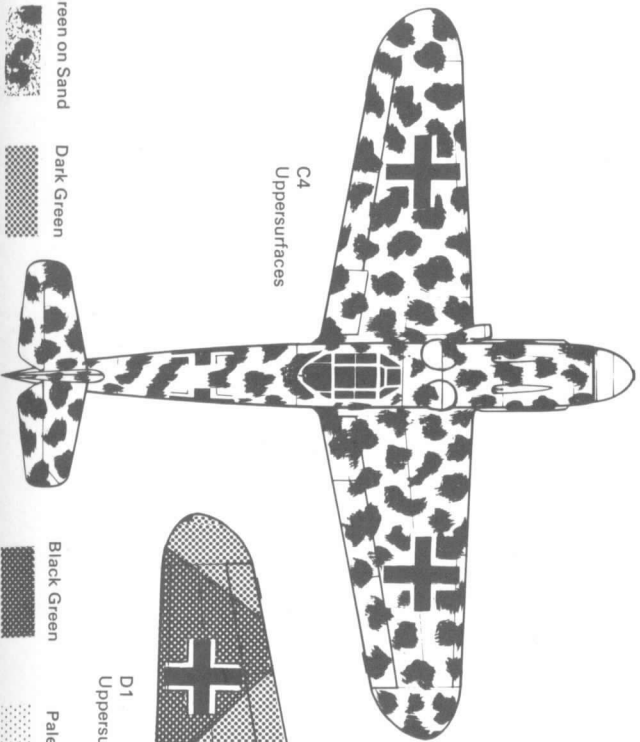


C3  
Uppersurfaces

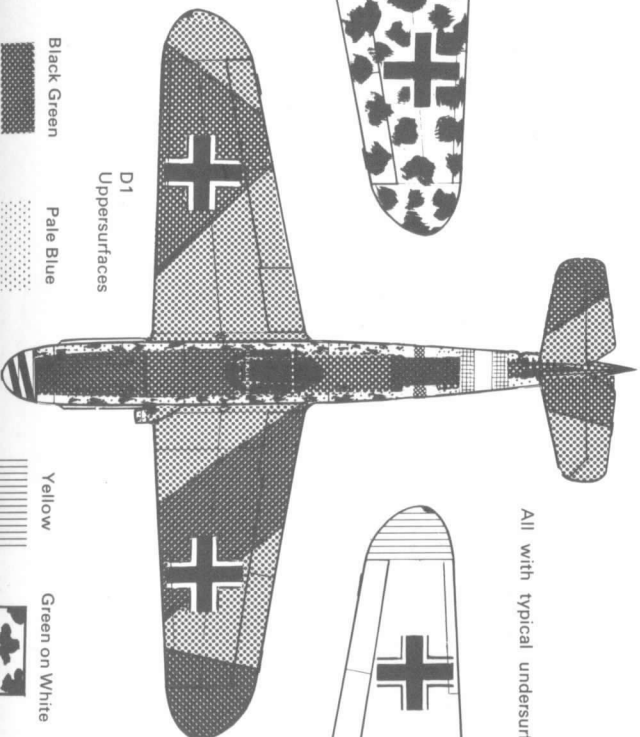


All with typical undersurfaces.

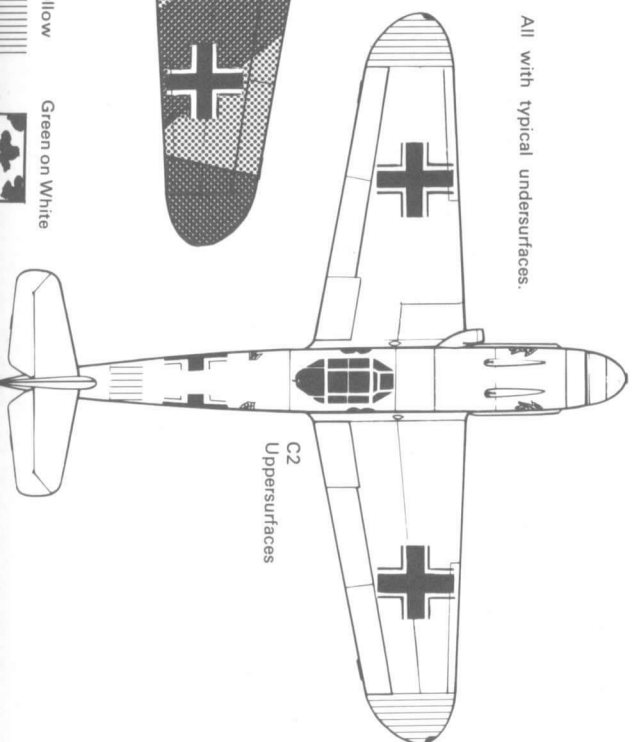
C4  
Uppersurfaces



D1  
Uppersurfaces



C2  
Uppersurfaces



Green on Sand



Dark Green



Black Green



Pale Blue

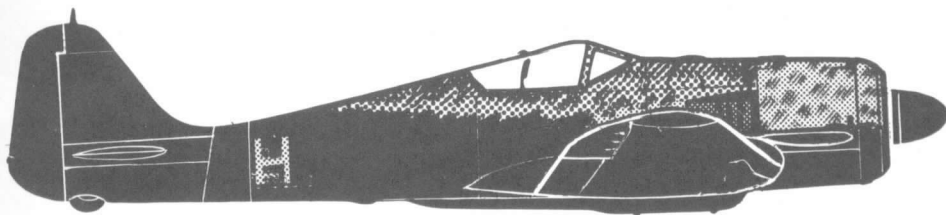


Yellow

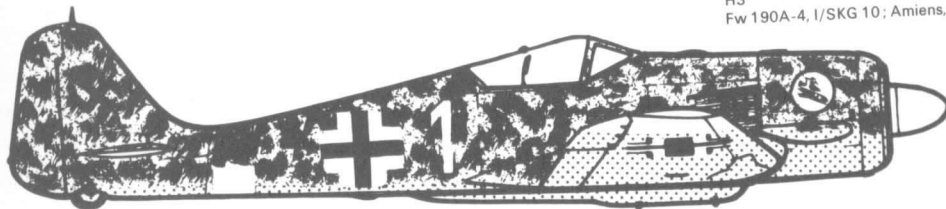


Green on White

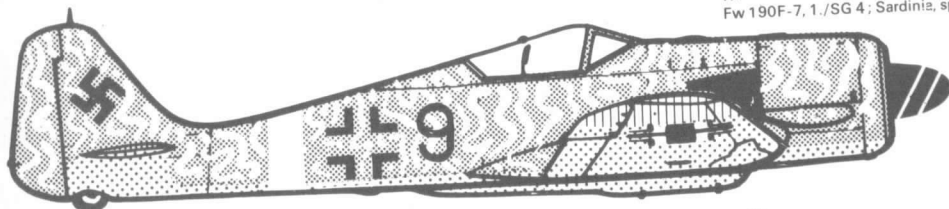




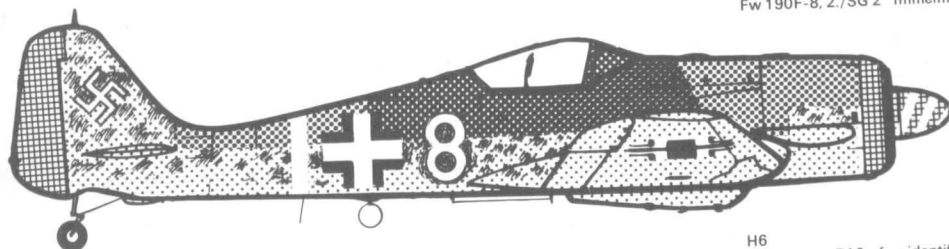
H3  
Fw 190A-4, I./SKG 10; Amiens, France, spring 1943.



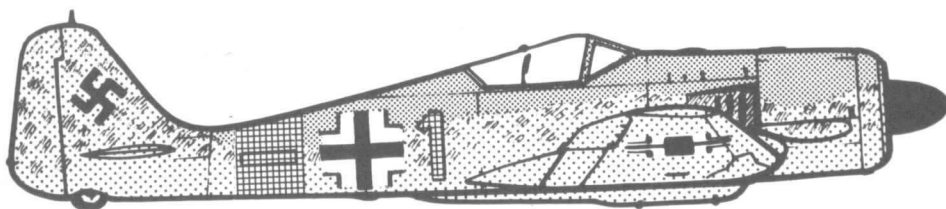
H4  
Fw 190F-7, 1./SG 4; Sardinia, spring 1944.



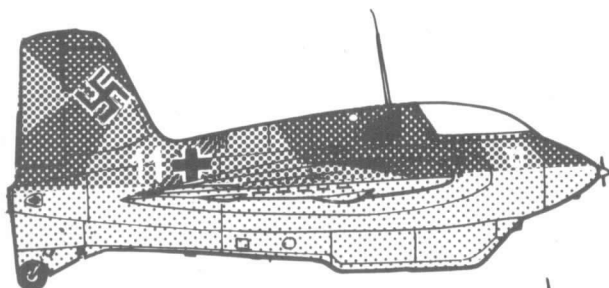
H5  
Fw 190F-8, 2./SG 2 "Immelmann"; Hungary, winter 1944/45.



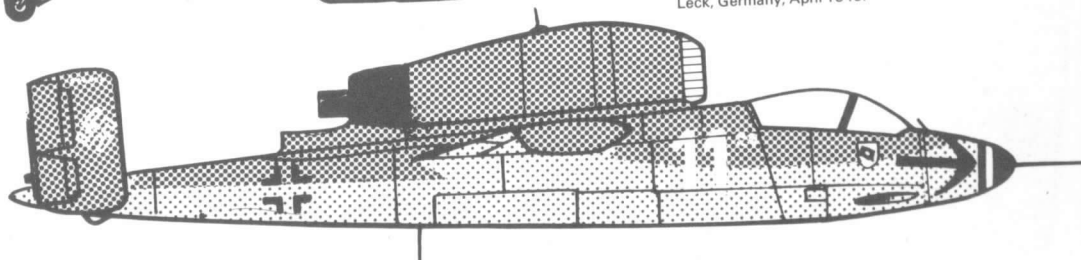
H6  
Fw 190F-9/R16 of unidentified unit, Baltic coast, early 1945.



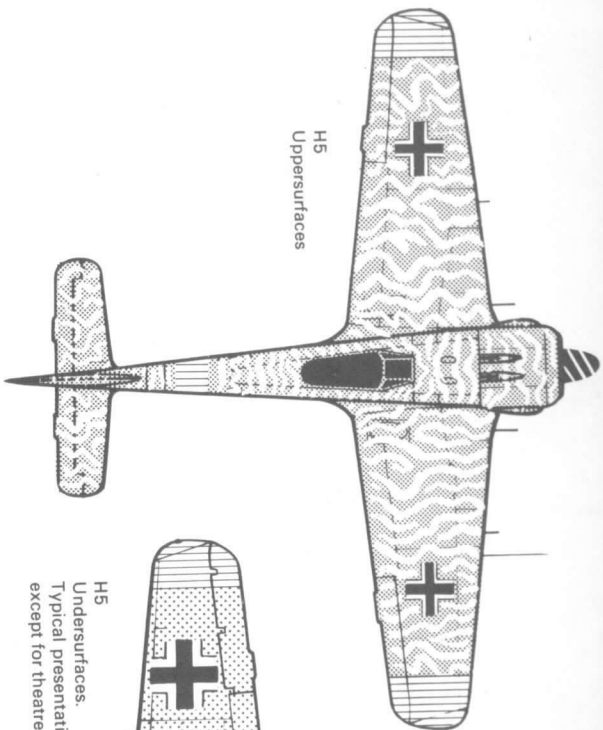
D2  
Fw 190A-8 of Obltn. Klaus Bretschneider, Staffelkapitän 5./JG 300 "Herrmann"; Home Defence, Germany, October 1944.



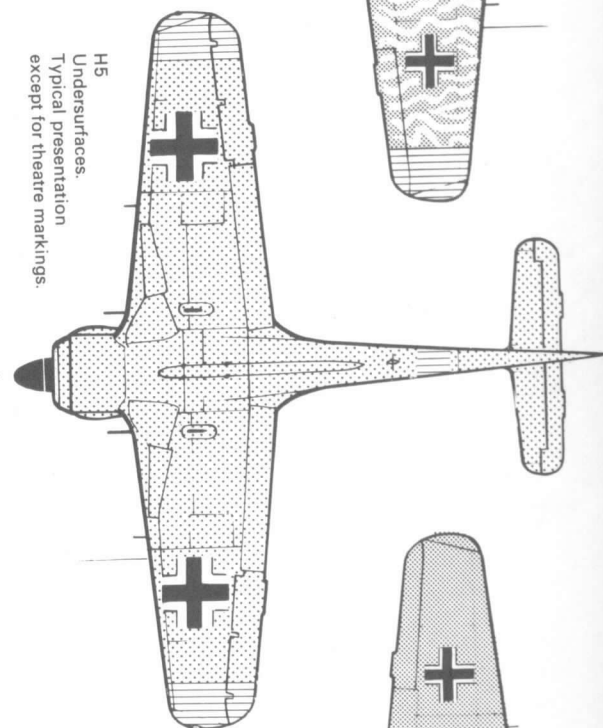
D5  
Me 163B-1, 1./JG 400.



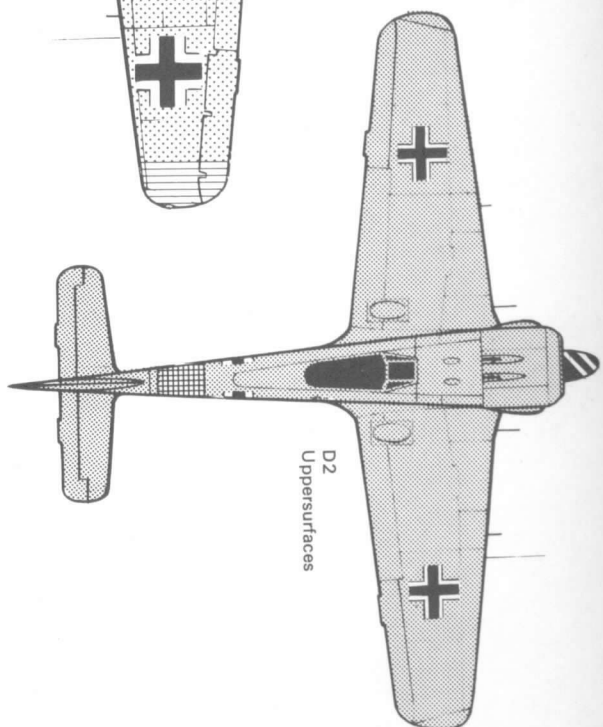
D7  
Heinkel He 162A-2 of Obltn. Demuth, Staffelkapitän 3./JG 1; Leck, Germany, April 1945.



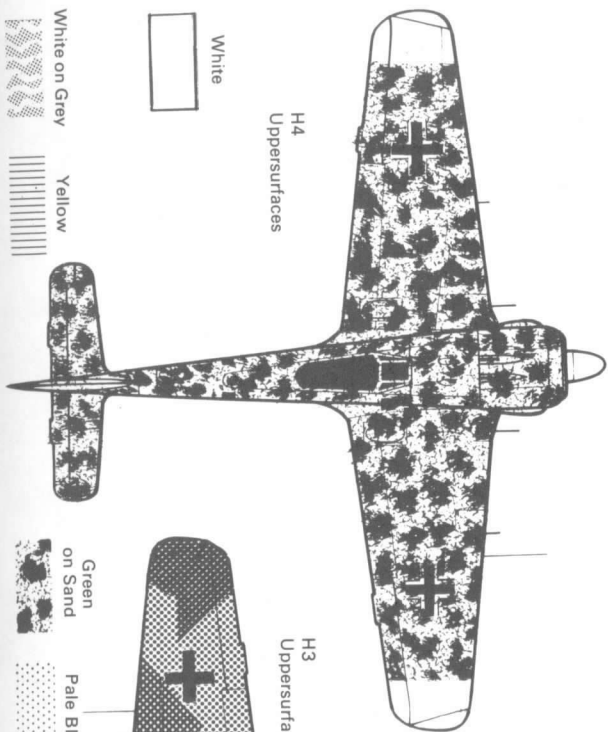
H5  
Uppersurfaces



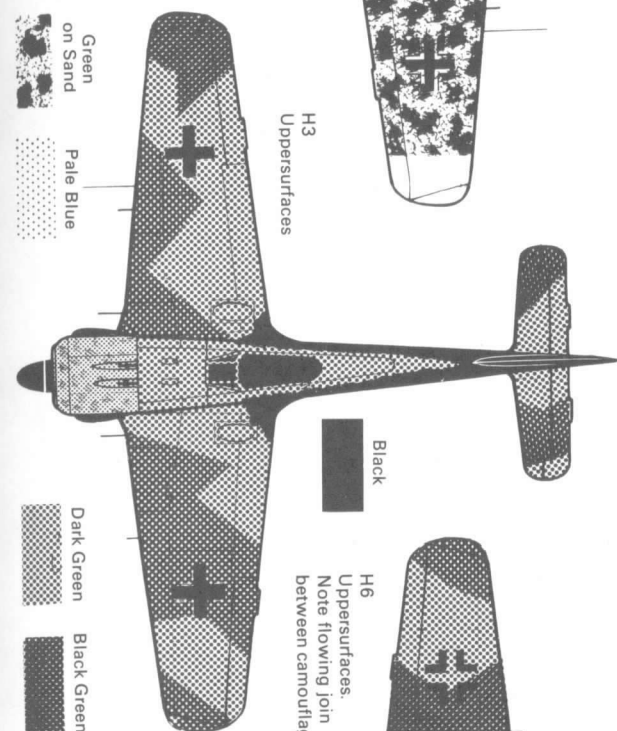
H5  
Undersurfaces.  
Typical presentation  
except for theatre markings.



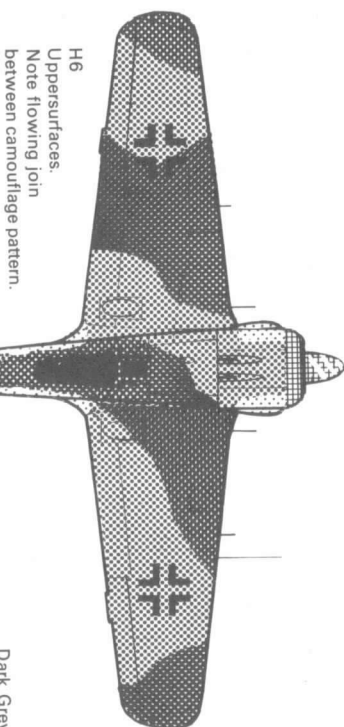
D2  
Uppersurfaces



H4  
Uppersurfaces



H3  
Uppersurfaces



H6  
Uppersurfaces.  
Note flowing join  
between camouflage pattern.

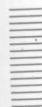
White



White on Grey



Yellow



Green  
on Sand



Pale Blue



Black



Dark Green



Black Green



Grey



Red

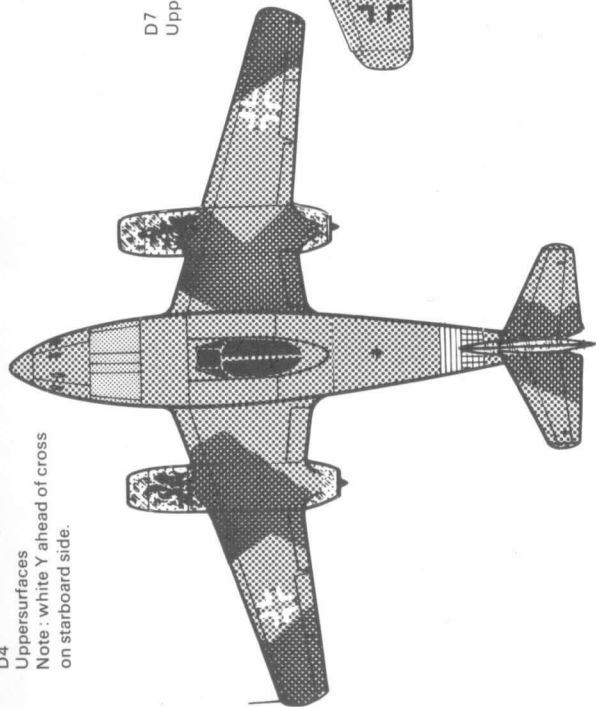


Dark Grey  
dapple  
on Grey

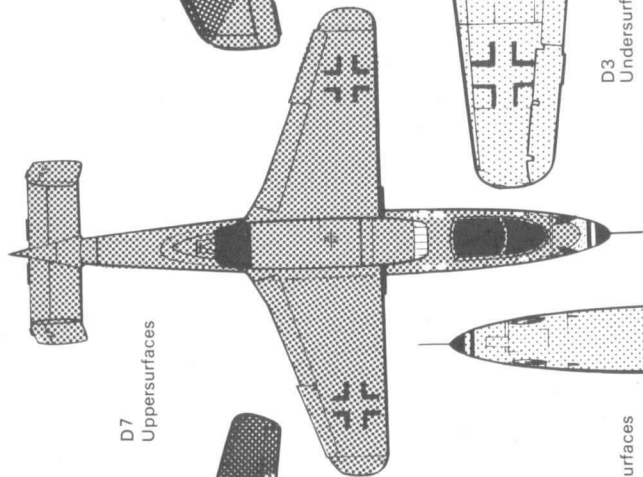




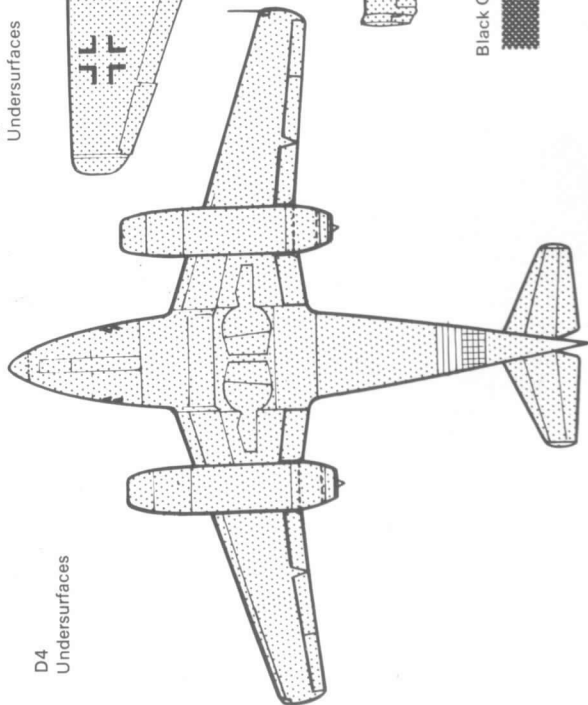
D4  
Uppersurfaces  
Note : white Y ahead of cross  
on starboard side.



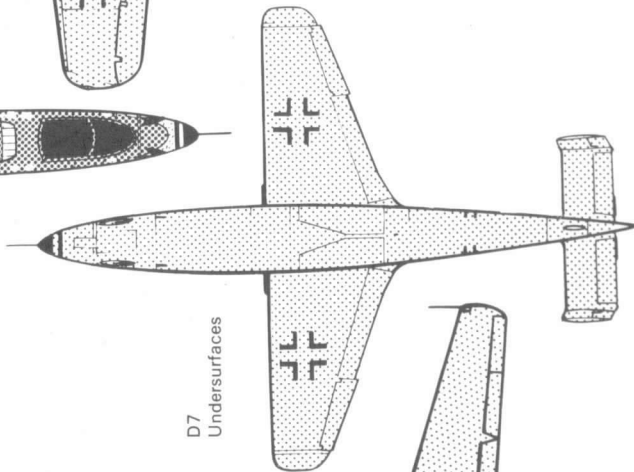
D7  
Uppersurfaces



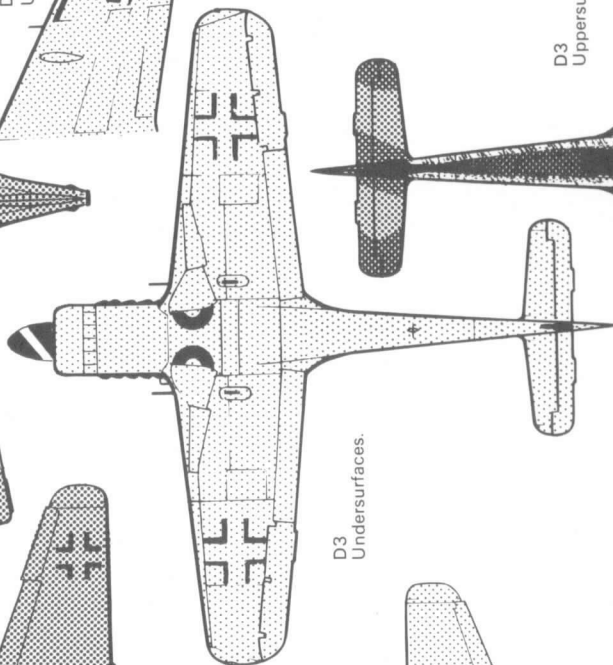
D4  
Undersurfaces



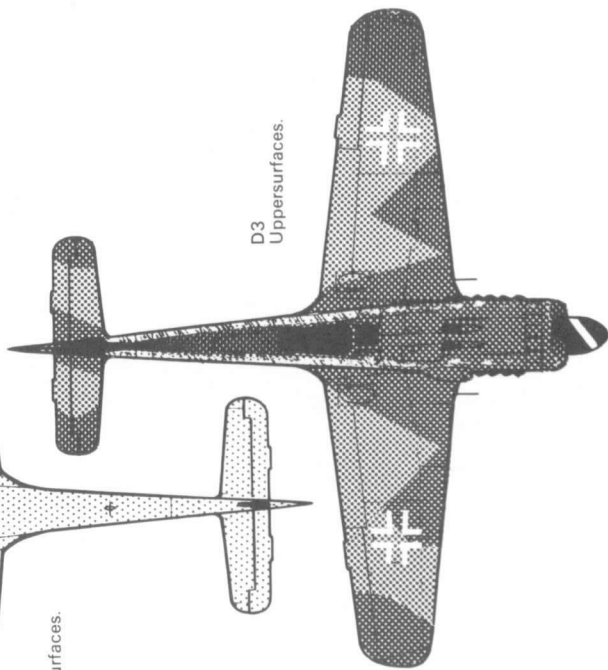
D7  
Undersurfaces



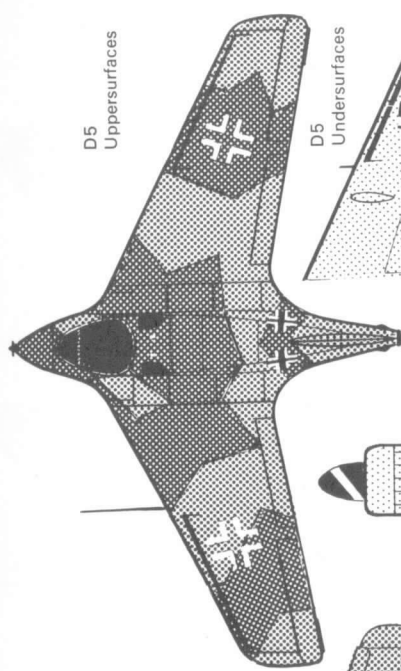
D3  
Undersurfaces.



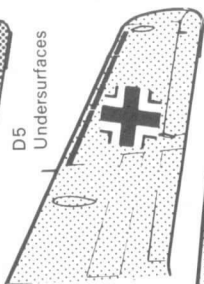
D3  
Uppersurfaces.



D5  
Uppersurfaces

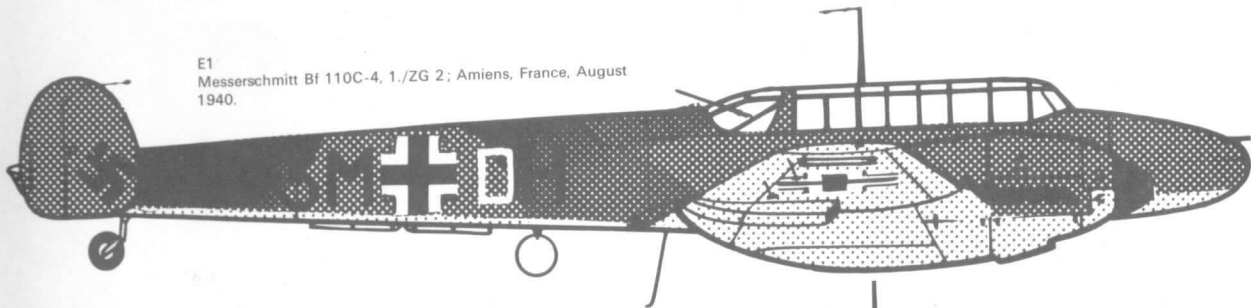


D5  
Undersurfaces

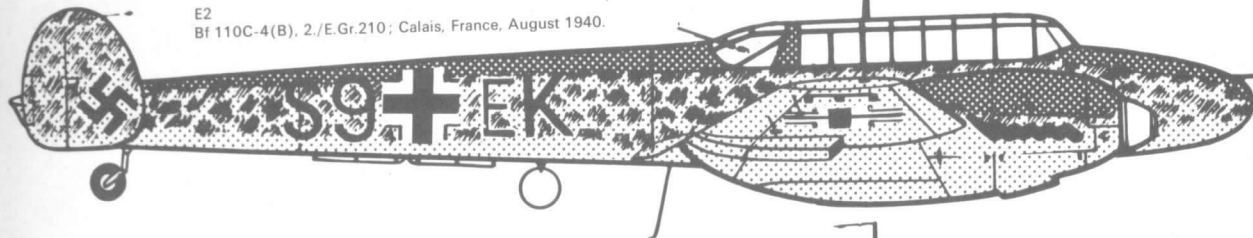


Black Green  
Dark Green  
Pale Blue

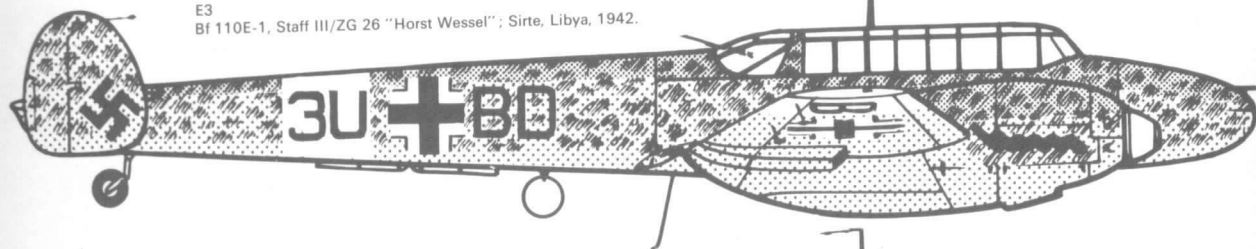
E1  
Messerschmitt Bf 110C-4, 1./ZG 2; Amiens, France, August 1940.



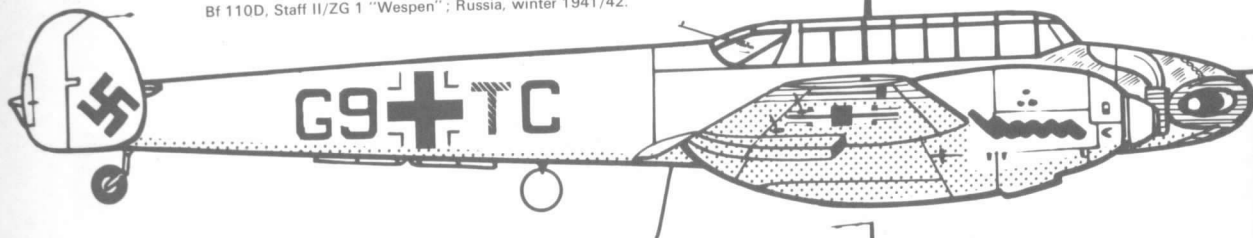
E2  
Bf 110C-4(B), 2./E.Gr.210; Calais, France, August 1940.



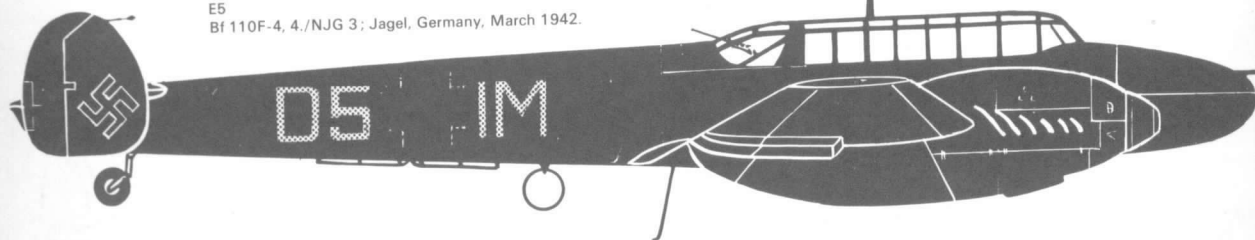
E3  
Bf 110E-1, Staff III/ZG 26 "Horst Wessel"; Sirte, Libya, 1942.



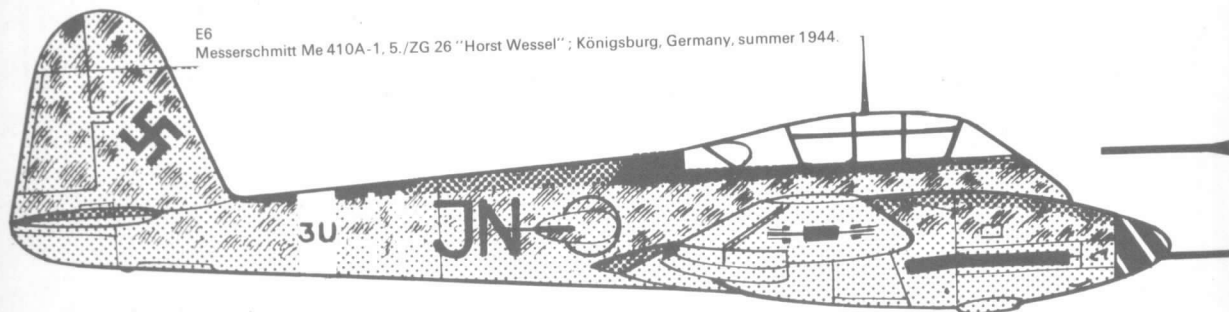
E4  
Bf 110D, Staff II/ZG 1 "Wespen"; Russia, winter 1941/42.



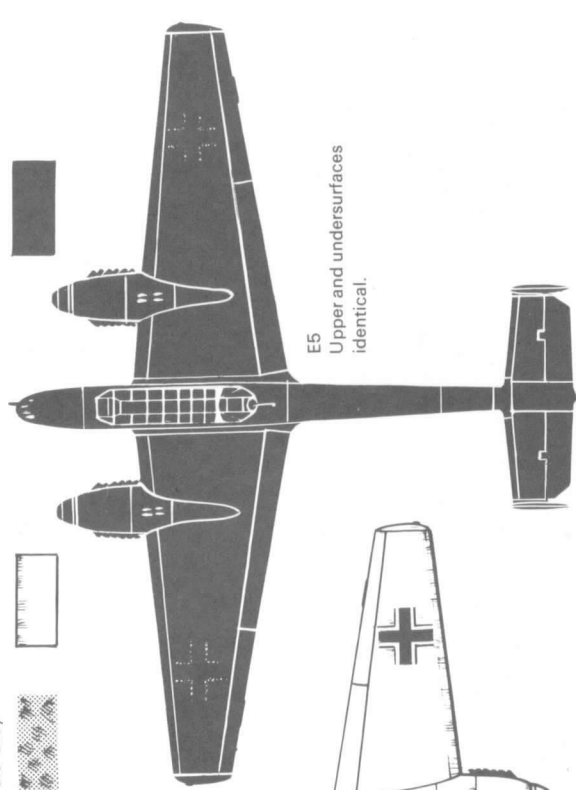
E5  
Bf 110F-4, 4./NJG 3; Jagel, Germany, March 1942.



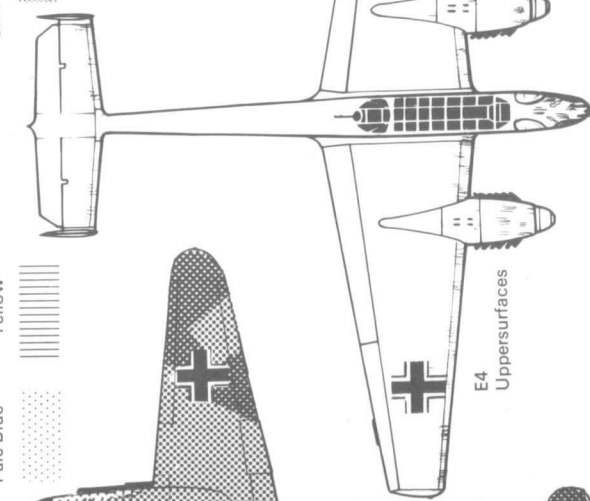
E6  
Messerschmitt Me 410A-1, 5./ZG 26 "Horst Wessel"; Königsburg, Germany, summer 1944.



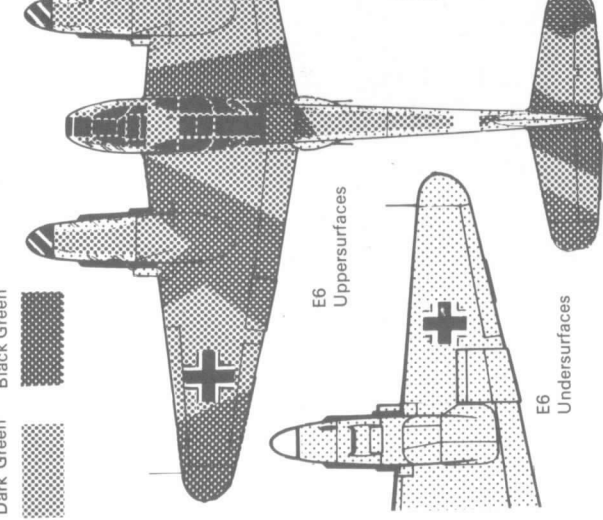
Dark Green  
 Dark Grey  
 dapple  
 on Pale Grey  
 Weathered  
 White  
 Matt Black



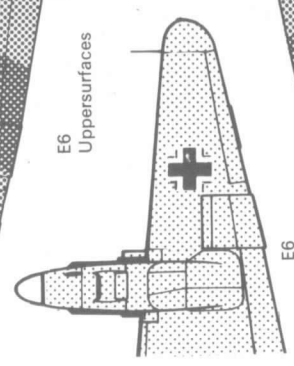
E5  
 Upper and undersurfaces  
 identical.



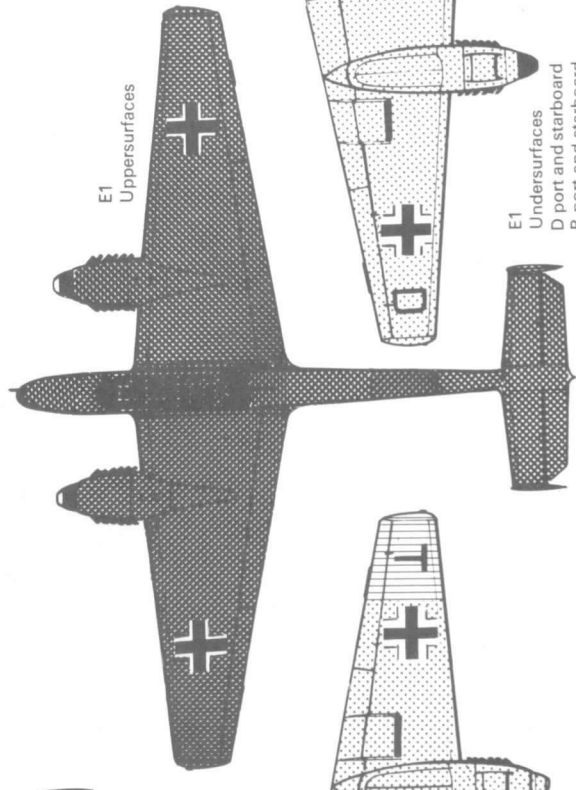
E4  
 Uppersurfaces



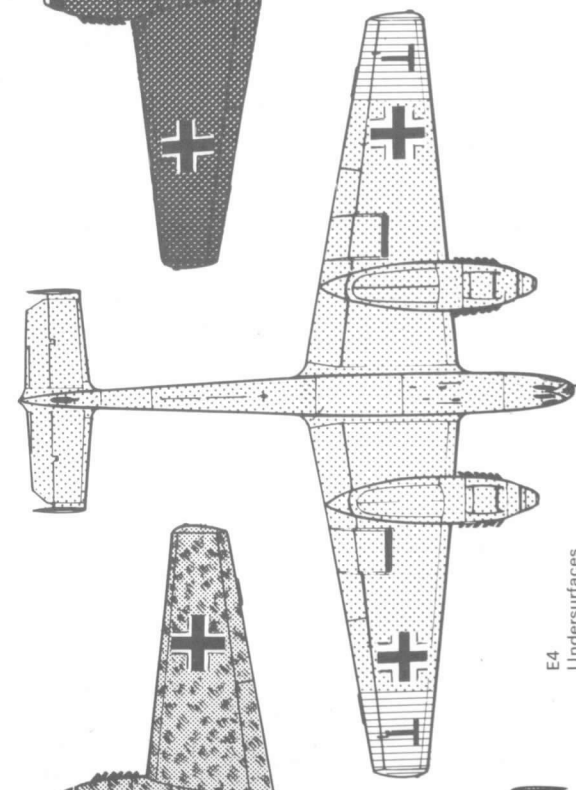
E6  
 Uppersurfaces



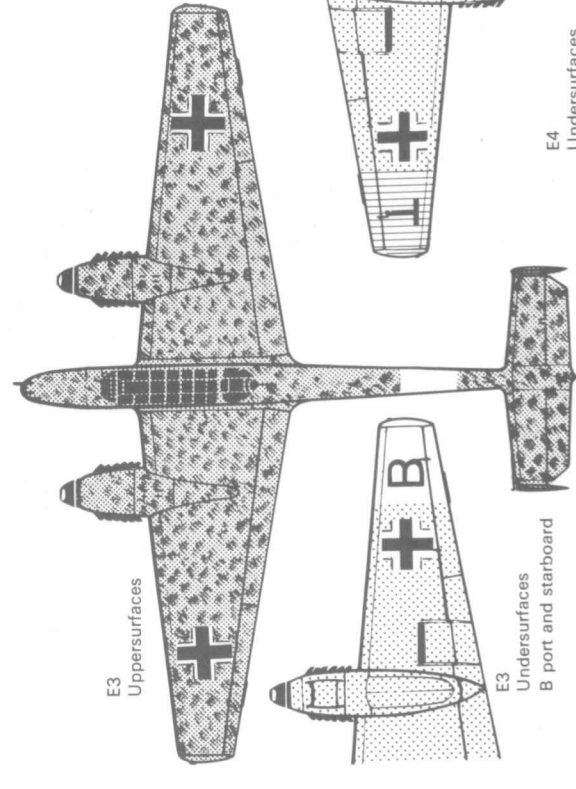
E6  
 Undersurfaces



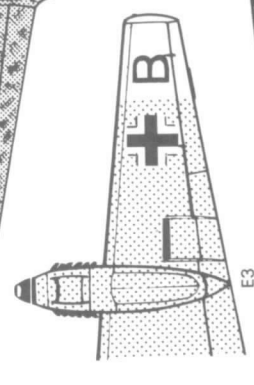
E1  
 Uppersurfaces



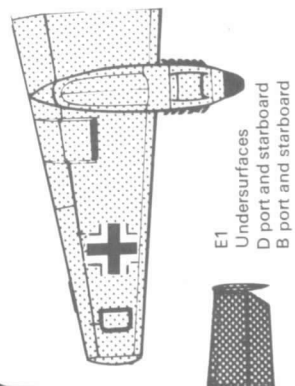
E4  
 Undersurfaces



E3  
 Uppersurfaces

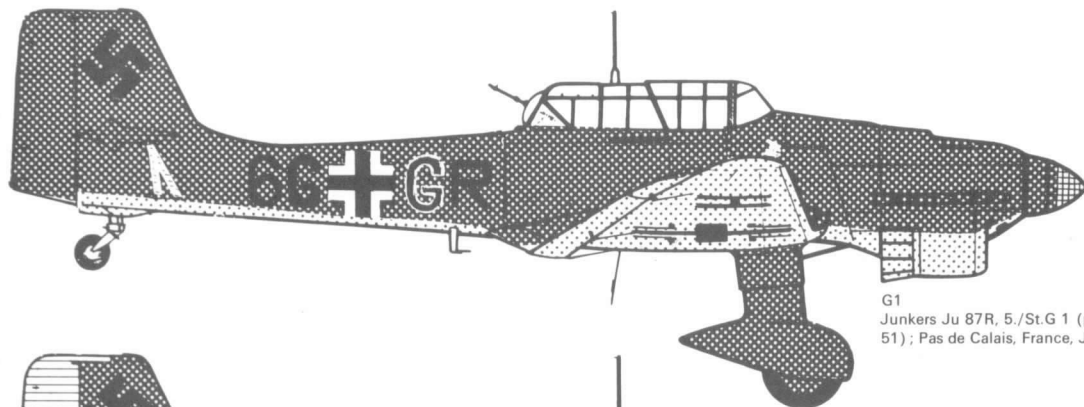


E3  
 Undersurfaces  
 B port and starboard

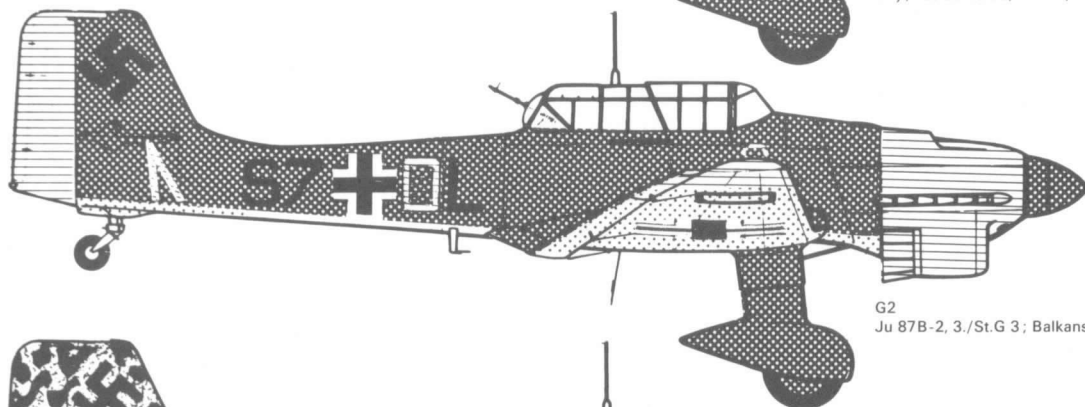


E1  
 Undersurfaces  
 D port and starboard  
 B port and starboard

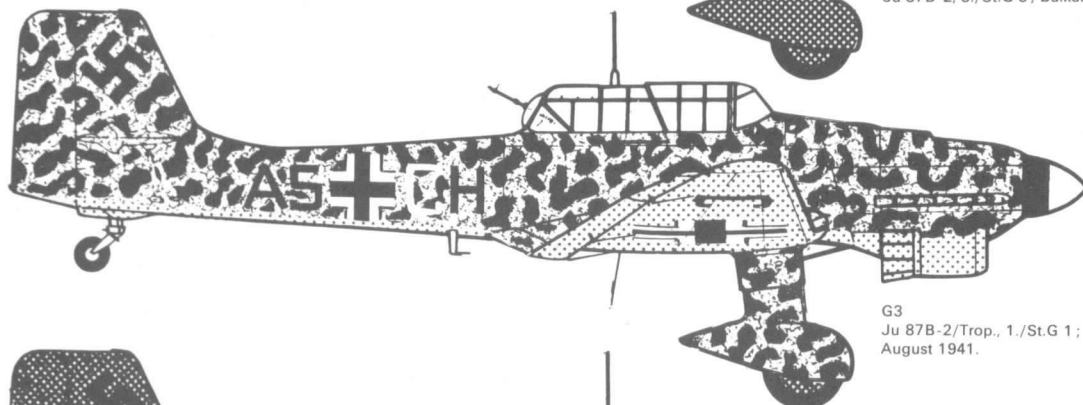
Typical presentation except for theatre marking



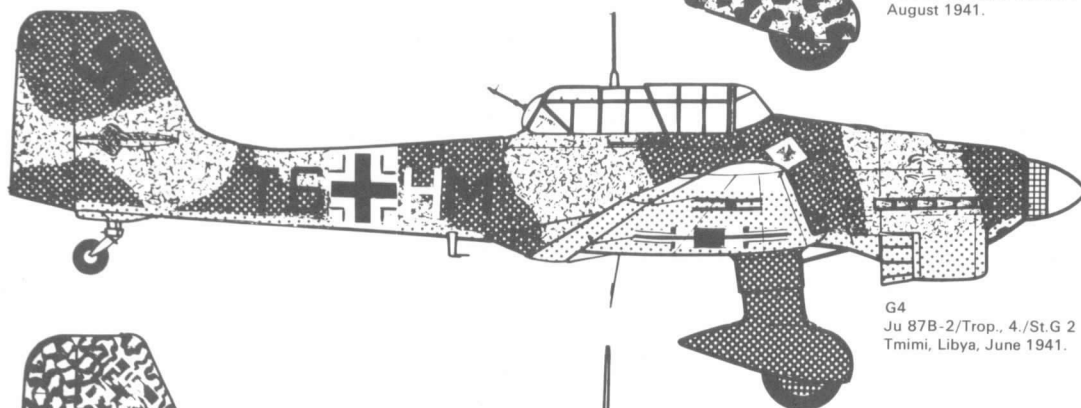
G1  
Junkers Ju 87R, 5./St.G 1 (previously 8./St.G 51); Pas de Calais, France, July 1940.



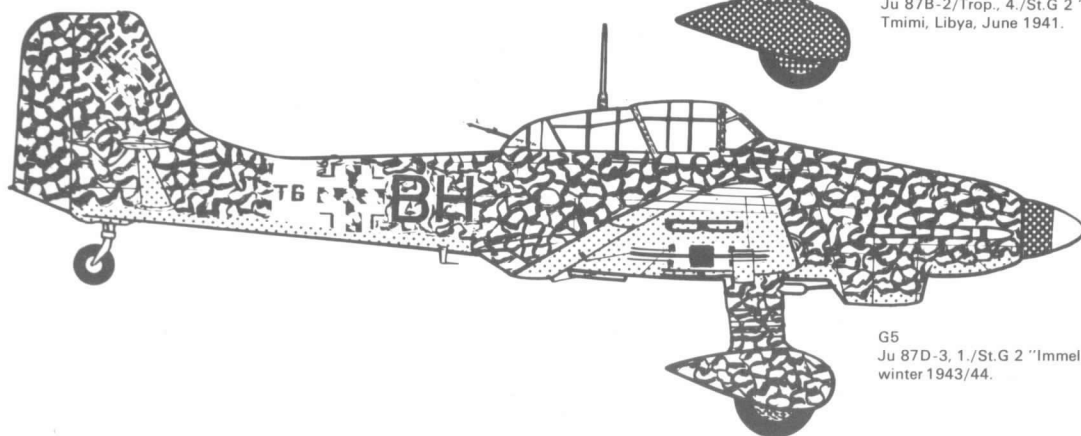
G2  
Ju 87B-2, 3./St.G 3; Balkans, spring 1941.



G3  
Ju 87B-2/Trop., 1./St.G 1; Derna, Libya, August 1941.



G4  
Ju 87B-2/Trop., 4./St.G 2 "Immelmann"; Tmimi, Libya, June 1941.



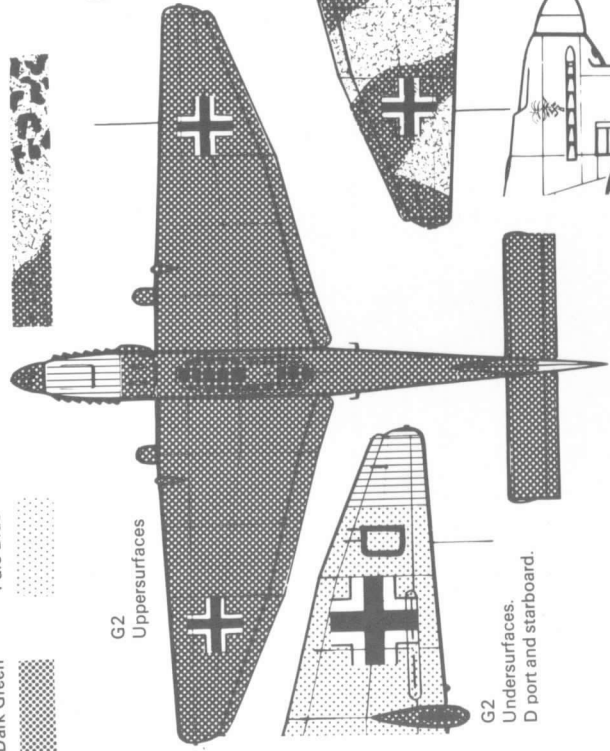
G5  
Ju 87D-3, 1./St.G 2 "Immelmann"; Russia, winter 1943/44.



Dark Green  
Pale Blue

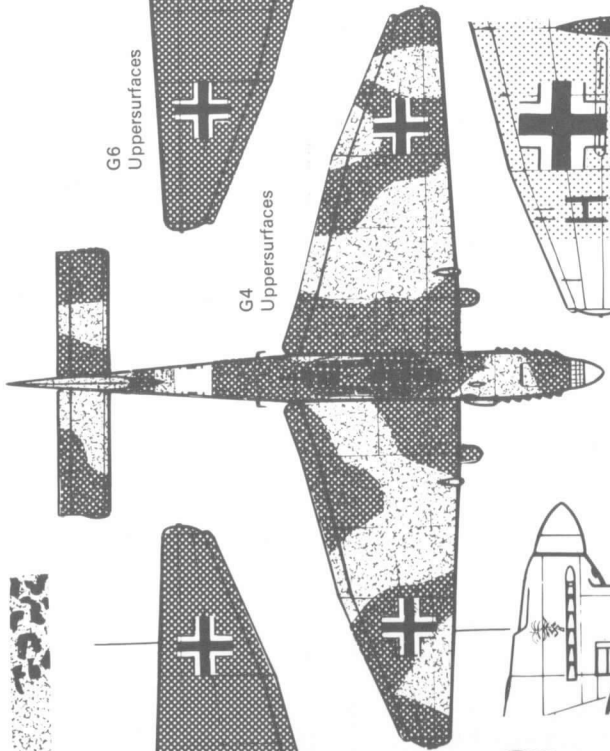
Green on Sand

G2  
Uppersurfaces

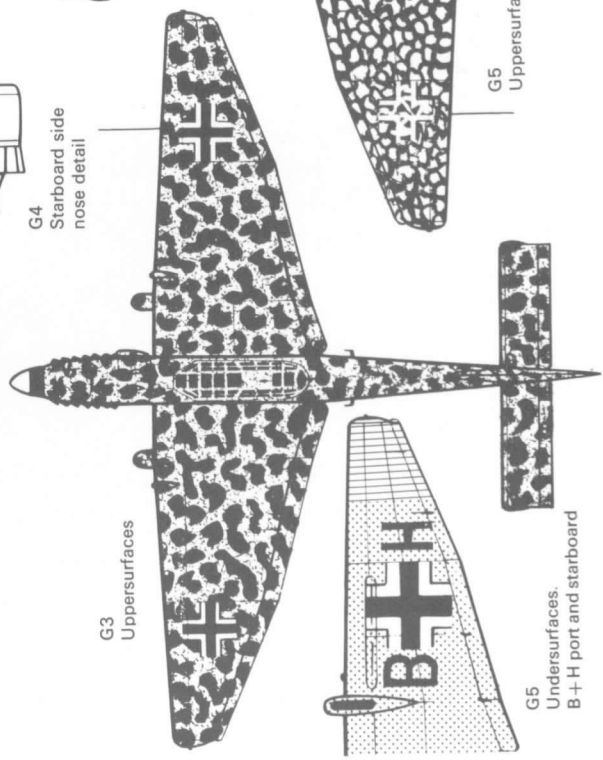


G2  
Undersurfaces.  
D port and starboard.

G4  
Uppersurfaces

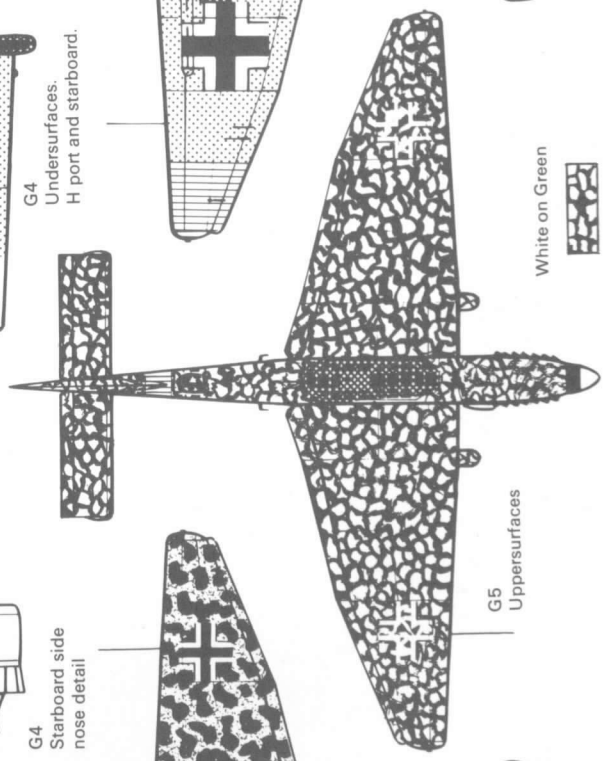


G3  
Uppersurfaces



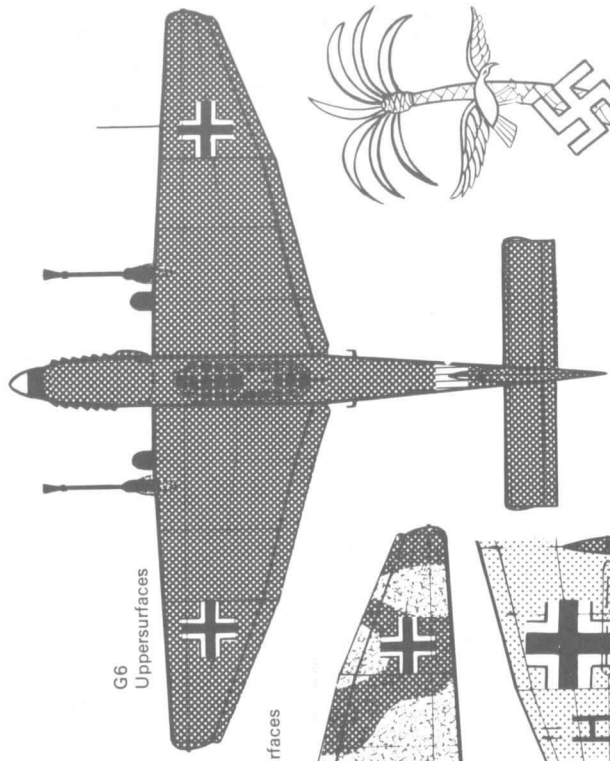
G5  
Undersurfaces.  
B+H port and starboard.

G5  
Uppersurfaces

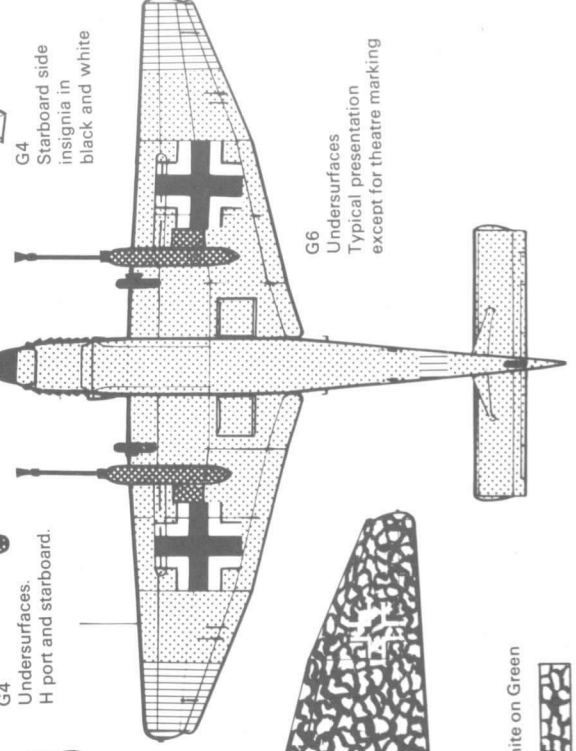


White on Green

G6  
Uppersurfaces



G4  
Undersurfaces.  
H port and starboard.



G6  
Undersurfaces  
Typical presentation  
except for theatre marking

G4

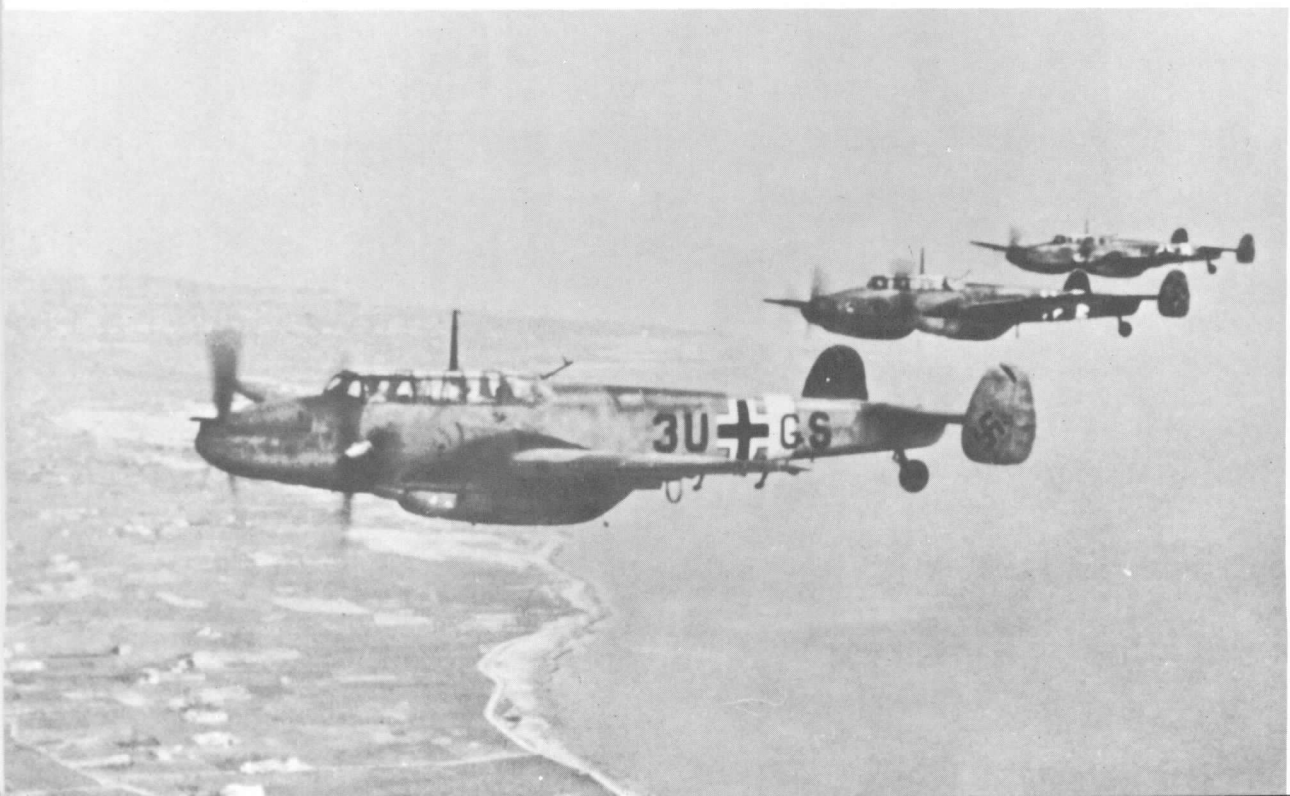
Starboard side  
insignia in  
black and white

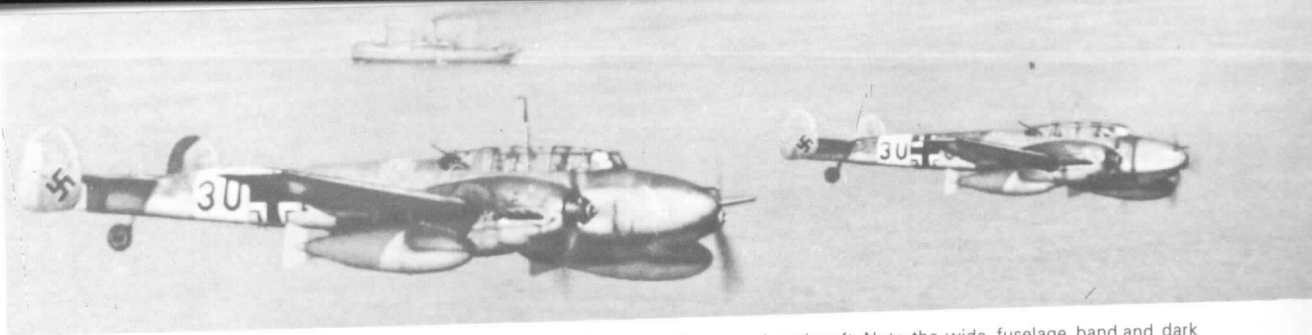




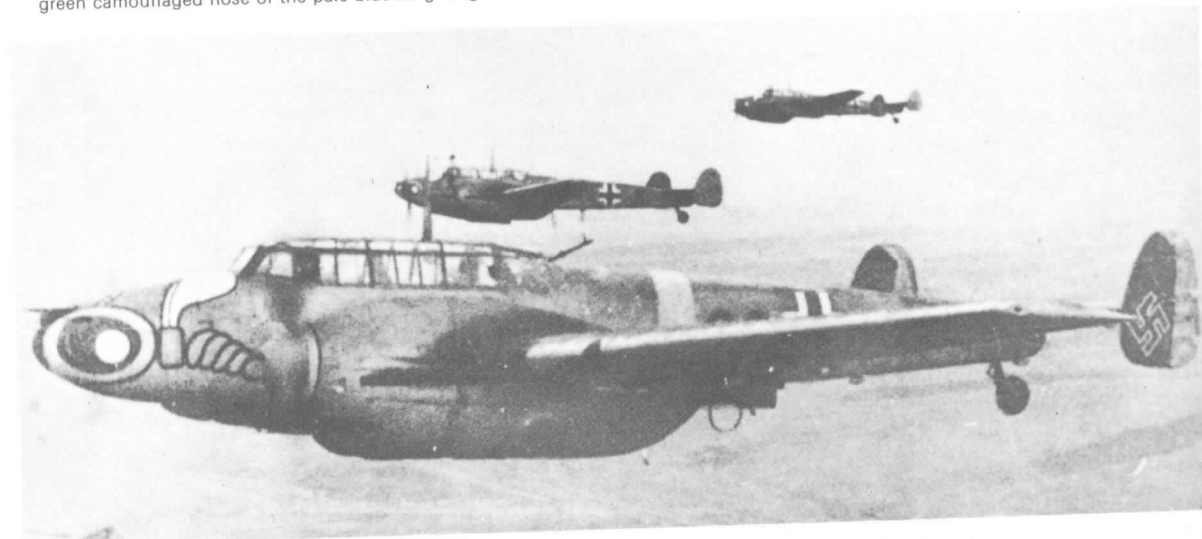
Above: A very pleasant photograph of three Messerschmitt Bf 110C's in 1940 vintage camouflage, splinter scheme on uppersurfaces, pale blue into grey and green dapple on fuselage sides and engine nacelles. Note white fuselage band ahead of cross and that the undersurface pale blue has been carried over and above the leading edge of the wing. Unit is SKG 210. (R. Ward)

Below: Another nice formation by Bf 110C's over the Mediterranean coast, similar scheme to those above but with only grey dapple on fuselage sides and engine nacelles. Theatre white band aft of fuselage cross. Unit is ZG 26 'Horst Wessel'. (via R. Ward)





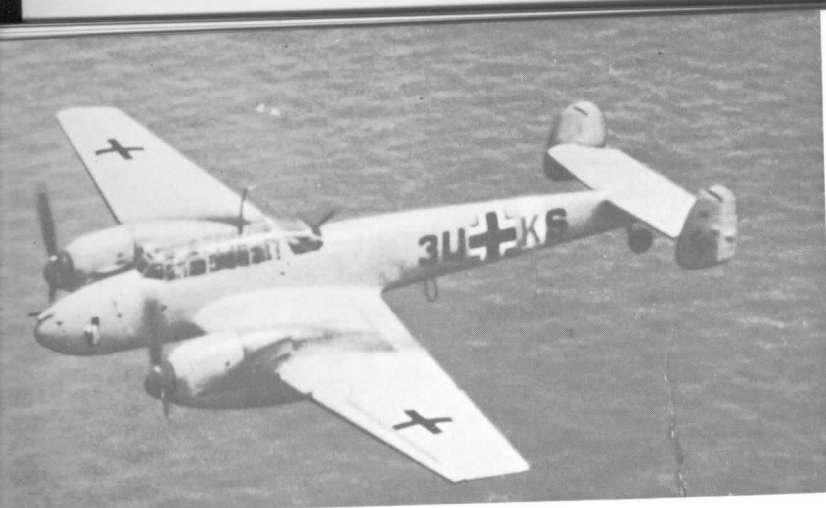
Above: A pair of Bf 110C's of 9./ZG 26 'Horst Wessel' in similar scheme to the preceding aircraft. Note the wide fuselage band and dark green camouflaged nose of the pale blue long range tanks. (R. Ward)



Above: Bf 110C's of ZG 1 'Wespen-Geschwader' over Russia, note position of fuselage band. (E. J. Creek)

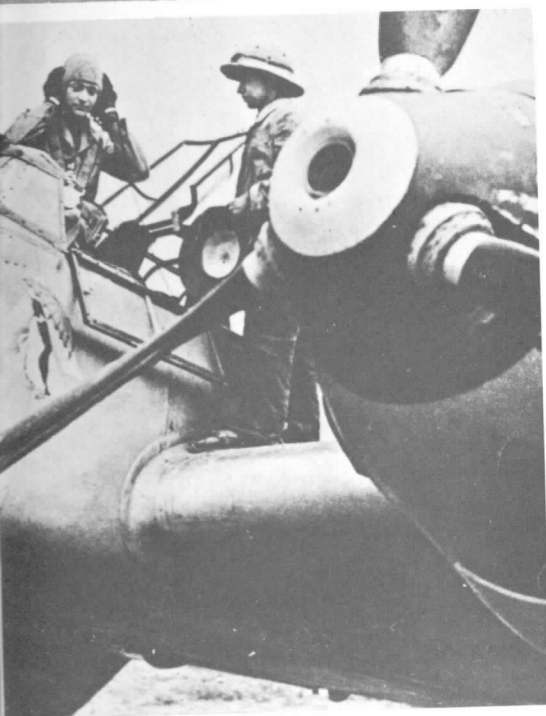
Below: Note the fighter type Staff marking on this Bf 110. (U.S. Nat. Arch.)



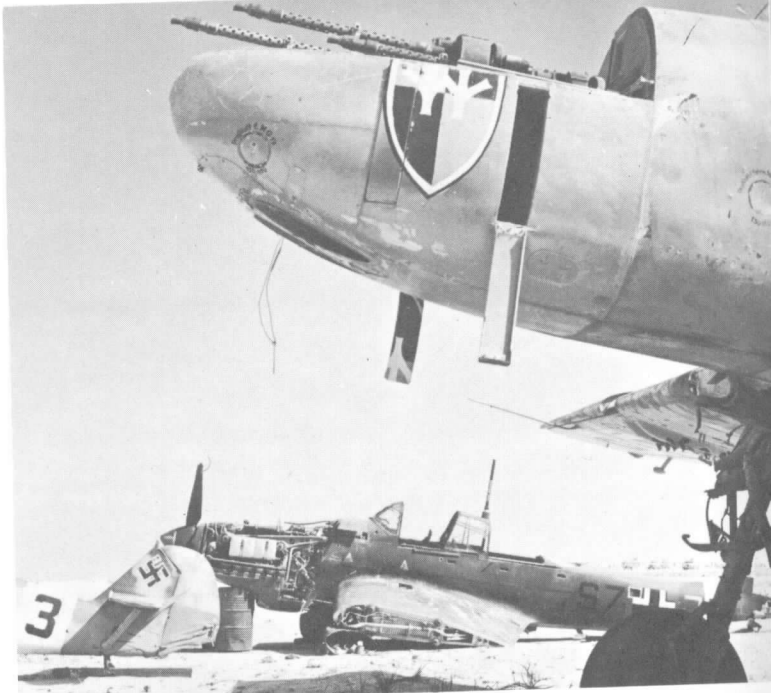


Left: Nice flying shot of a sand camouflaged Bf 110C of ZG 26 'Horst Wessel' over the blue Mediterranean. (R. Ward)

Below right: Nose detail of Bf 110 of 9/ZG 26, note unusual position of aircraft letter on white fuselage band of Bf 109E in background. Stuka of St. G. 3 is in sand and green segment camouflage. (I.W.M.)



Above, left: Nose detail of a Bf 110C of 7/ZG 26, Western Desert 1941. (R. Ward)



Below: Interesting collection of Desert camouflage and insignia on Luftwaffe aircraft in a dump near Daba LG. Note again the Bf 109 under the nose of the Stuka. (I.W.M.)







Right: Henschel Hs 126 in standard green and pale blue camouflage, note radio call sign under uppersurface of wing and position of wing crosses. (R. Ward)

Below: Dark green and pale blue camouflaged Junkers Ju 87B in early 1940. Unit unknown. (U.S. Nat. Arch.)



Below: Splinter camouflaged Junkers Ju 87B of St. G. 77 over the Dneiper in Russia. (U.S. Nat. Arch.)





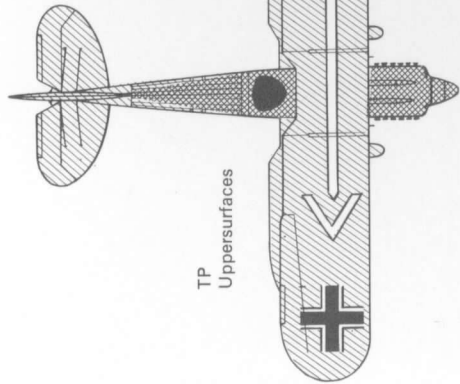
Above : Green dapple on sand camouflage shown to advantage in this photograph of a Ju 87B-2 Trop of St. G. 1 on a Western Desert L.G. (I.W.M.)



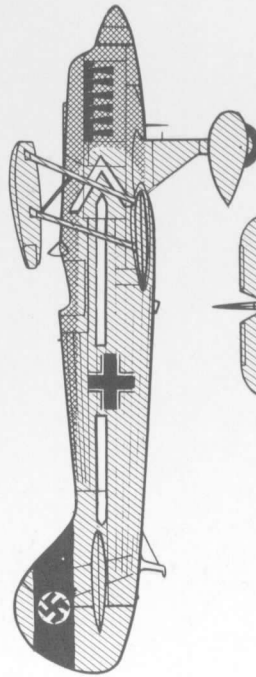
Above : Nose detail of a splinter camouflaged Ju 87D of St. G. 1, Western Desert. (I.W.M.)

Below : Sand and green camouflaged Ju 87B's of St. G. 3 in the dump near Daba. Note variations in position of white band. (I.W.M.)

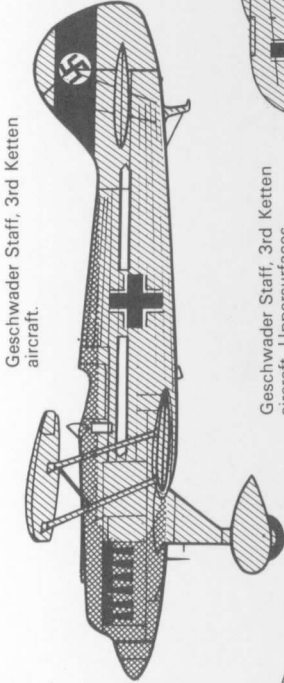
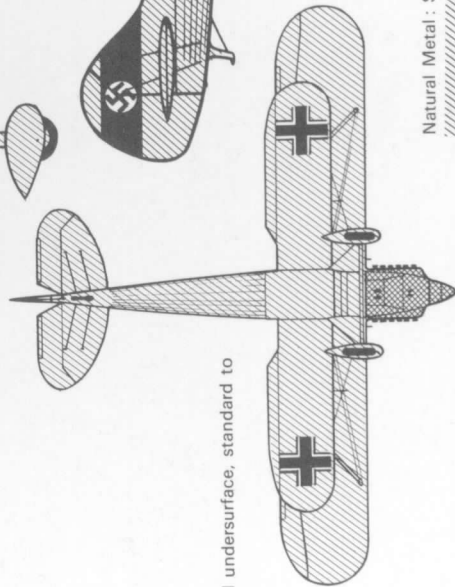




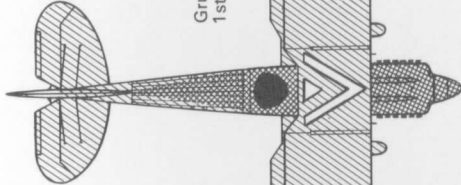
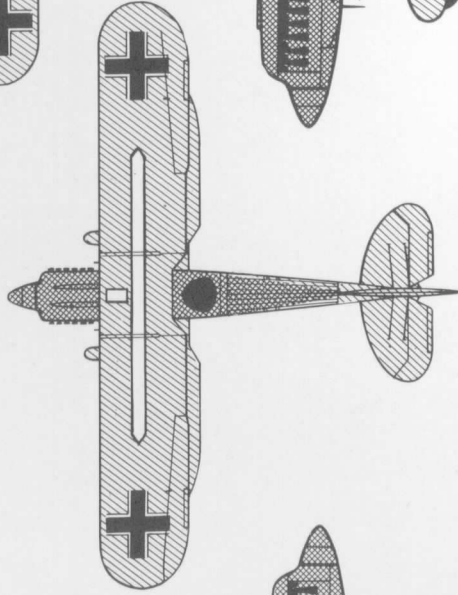
TP  
Heinkel He 51, Geschwader Staff JG 233.



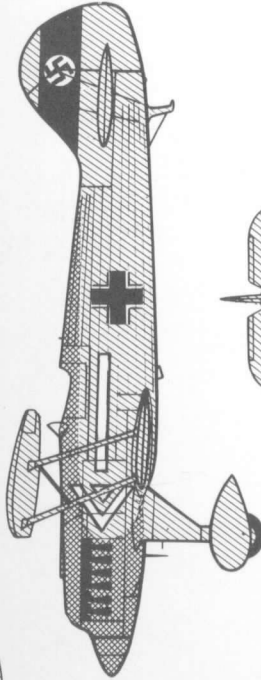
TP Typical undersurface, standard to all aircraft.



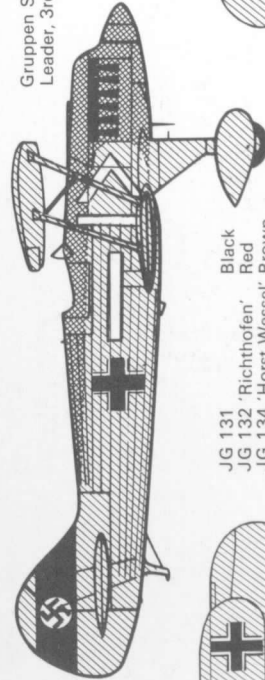
Geschwader Staff, 3rd Ketten aircraft. Uppersurfaces.



Gruppen Staff, II Gruppe Leader, 1st Ketten aircraft.



Gruppen Staff, II Gruppe Leader, 3rd Ketten aircraft.



- JG 131 Black
- JG 132 'Richthofen' Red
- JG 134 'Horst Wessel' Brown
- JG 232 Green
- JG 233 Blue
- JG 234 Orange

Natural Metal : Silver Dope

Note : Red band on rudder shown black.

Coloured area as list above



All markings are White outlined with Black.

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Commonwealth Sabre Mk 30/32
- 21 Kawasaki Ki.61—I/III Hien/Ki.100

- 22 North American B-25C/H. Mitchell
- 23 Vought F4U-1/7 Corsair
- 24 Hawker Hurricane Mk I/IV
- 25 Nakajima Ki.44—Ia/IIb Shoki
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- Belgian Air Force**
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- West German Luftwaffe**
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- Battle of Britain Bombers** Vol. 2.

### Front Cover, top to bottom:

Heinkel He 51, 4/J88, Legion Condor; Leon, Spain, spring 1939  
Messerschmitt Bf 109F-2 of Hptm. Hans 'Assi' Hahn, Kommandeur III/JG 2 'Richthofen'; St. Pol, France, July 1941  
Junkers Ju 88A-4, 4./KG 54 'Totenkopf'; Russia, January 1942  
Dornier Do 17Z-2, 10./ZG 26 'Horst Wessel'; Castel Benito, Libya, 1941  
Focke-Wulf Fw 190A-4, I/JG 54 'Grunherz'; North Russia, 1943