THE LUFTWAFFE IN CAMERA 1939–1945

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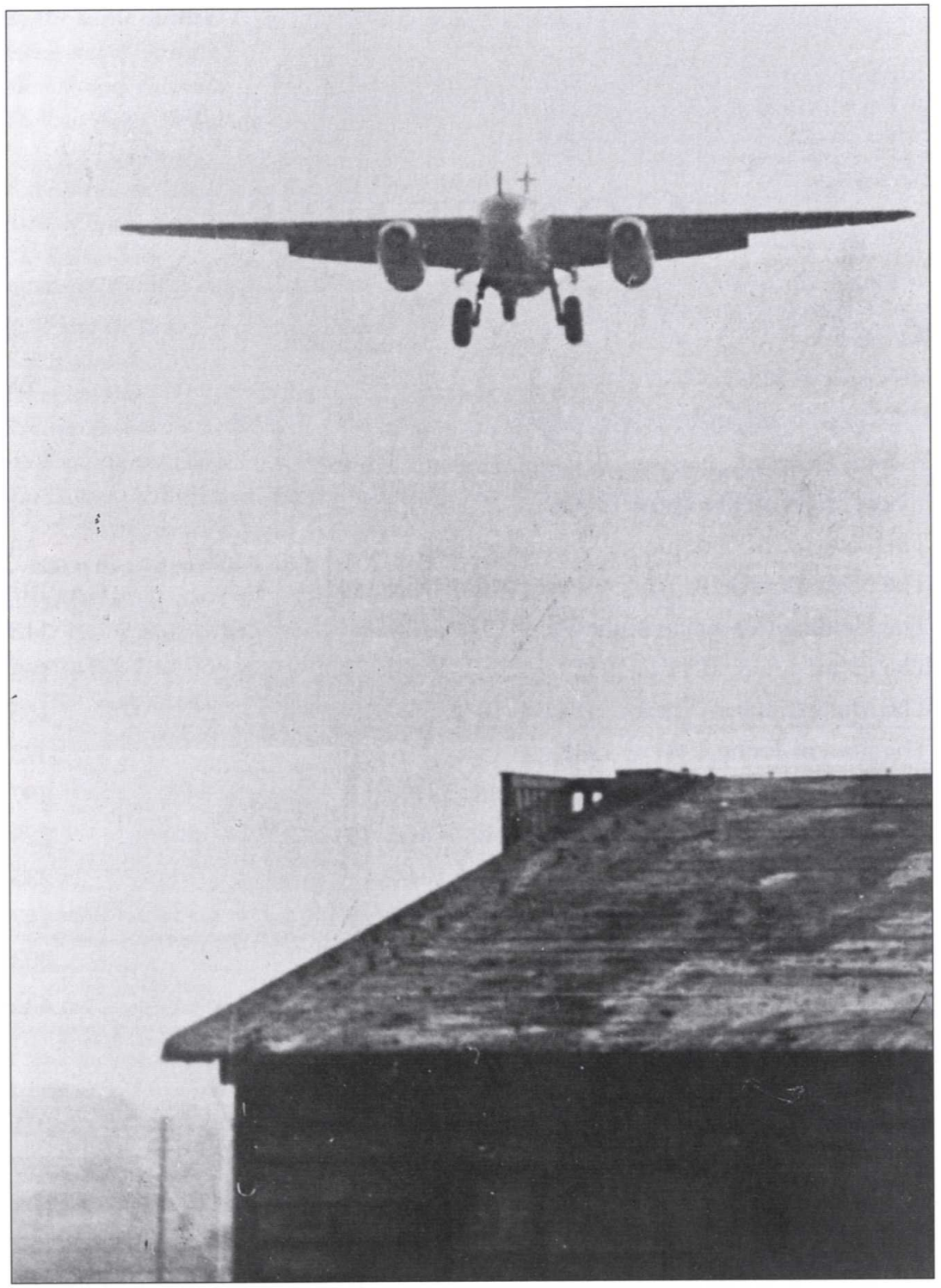


Arado Ar 234 bomber of IIIrd Gruppe of Kampfgeschwader 76 (III./KG 76) on the landing approach at Burg bei Magdeburg in the autumn of 1944. KG 76 Archiv

INTRODUCTION

This book depicts, in photographs taken during the Second World War, the Luftwaffe in its many aspects. At the start of the war, the period September 1939 to September 1942 saw the force play a major part in securing a spectacular run of victories for German arms.

At the start of the war the Luftwaffe was one of the largest air forces in the world, and it was certainly the best equipped and trained. In each of the combat roles the aircraft types operated by the Luftwaffe were usually far superior to any enemy counterparts facing them. The sole exceptions were the Spitfire fighter and the Wellington bomber operated by the Royal Air Force. The performance of these planes was roughly equivalent to those of the Messerschmitt Bf 109 and the Heinkel He 111 respectively, although neither British type was yet available in large numbers.

In a series of carefully prepared Blitzkrieg offensives the German Army, with powerful air support, achieved breathtaking territorial gains over a twenty-month period. First Poland, then Denmark and Norway, then Holland, Belgium and France, and finally Yugoslavia and Greece were all defeated and occupied. The only serious setback for the Luftwaffe during this period was the Battle of Britain in the summer of 1940. Then, despite a long and hard-fought series of actions, the Luftwaffe failed to secure the air superiority over southern Britain that was an essential prerequisite for invasion. Yet, although the Luftwaffe incurred serious losses during the attacks on Britain, its reserves of aircraft and crews were sufficient to make good the gaps in its ranks. As a result the Luftwaffe emerged from the Battle of Britain as strong as it had been at the start of the campaign.

In June 1941 German forces launched yet another all-out Blitzkrieg offensive, this time against the Soviet Union. At first it seemed this would be merely a re-run of what had gone before. The German Army fought a series of large-scale enveloping actions, capturing millions of prisoners and vast quantities of military hardware. The Luftwaffe destroyed thousands of Soviet planes on the ground and in the air.

When it took part in a Blitzkrieg offensive, the Luftwaffe was expected to

provide the maximum possible support for the army. By flying high daily sortie rates, and mounting low-altitude bombing and strafing attacks, it brought the full weight of its fire power to bear on enemy ground forces. Losses in aircraft and crews were accepted, and acceptable, provided the campaign could be brought to a rapid and victorious end.

At the start of the campaign in the East the Luftwaffe discovered a perplexing difference between this action and those fought earlier, however. In previous campaigns the enemy troops had 'gone to ground' when they came under air attack. The Soviet soldiers, in contrast, stood their ground and loosed off at their tormentors with any weapon that came to hand. In any one engagement there was only a very small chance that rifle or light machine-gun fire would bring down an aircraft. But, such was the pace of air operations, there were thousands of these encounters each week. As a result Luftwaffe losses began to mount.

At the end of the first hundred days of the offensive the Luftwaffe found itself in serious trouble. Over that period it had suffered an average daily loss of sixteen planes destroyed and ten damaged. Cumulatively, such a daily loss sustained over so long a period had disastrous consequences. The Luftwaffe lost just over 1,600 aircraft destroyed and a further 1,000 damaged, a total of 2,600 aircraft put out of action. That number was just short of the 2,770 combat planes it sent into action at the start of the campaign. In the same period the German aircraft industry produced about 2,200 combat planes. So the losses in aircraft destroyed and damaged on the Eastern Front alone exceeded production by about 20 per cent. Of course, many damaged aircraft were repaired and put back into service. But that took time and the reserve of combat aircraft, assembled in aircraft parks before the campaign, was soon exhausted.

Only when the harsh Russian winter forced an end to large-scale air operations in that theatre, did the Luftwaffe get a respite. Then the depleted combat units could be withdrawn, in rotation, to rest and re-form. Losses fell sharply, allowing units to be restored to full strength with new and repaired aircraft. By February 1942 the immediate crisis had passed. However, it was a cruel portent of what could be expected when large-scale operations resumed on the Eastern Front later in the year. In December 1941 the USA entered the war on the side of the Allies. The US government moved rapidly to build up its forces and switch the nation's vast industrial capacity into armament production. Nevertheless, more than a year would elapse before US forces posed any significant direct threat to the Luftwaffe.

The hiatus in operations on the Eastern Front in the winter of 1941–42 allowed the Luftwaffe to strengthen its forces in other theatres. An influx of combat units into the Mediterranean area early in 1942 led to a rapid upsurge in activity there. Malta came under heavy air attack, and the highly effective blockade came close to starving the islanders into submission. In North Africa the revitalized Fliegerkorps Afrika supported the German Army in

a succession of thrusts that took it almost to the gates of Cairo.

In the late spring of 1942 the ground dried out after the long Russian winter and spring thaw, allowing a resumption of large-scale operations. While the German Army made final preparations to resume its offensive, Luftwaffe units began concentrating in the theatre in readiness to provide support. After a long hard fight the German Army occupied the Crimea. In June the Panzers resumed their thrust eastward, heading for the valuable oilfields in the Caucasus area. Once again there were rapid initial advances, though not quite so rapid as those in the previous year. And yet again the Luftwaffe suffered heavy cumulative losses.

In September 1942 the territory occupied by German forces reached its greatest extent. The area under their control extended from Brittany in France to the Volga River in Russia, from the North Cape of Norway to the desert sands of Egypt.

Although the Luftwaffe was still an impressively strong fighting force, the first cracks in its edifice had begun to show. In terms of combat aircraft its numerical strength was a little larger than a year earlier, but the sum of its commitments was now far greater. The force was required to provide air support in three major but distant theatres of operations. In addition there was a large and growing home defence effort which tied down a quarter of its total fighter strength (including almost all its night fighters). In truth the Luftwaffe was now seriously overextended, with scarcely any combat units in reserve to meet emergencies. The bulk of its forces were concentrated on the Eastern Front, but to achieve this it had had to cut to the bone the number of combat units in the West and in the Mediterranean area.

As serious as the severe numerical deficiencies in its strength, the Luftwaffe had to face the approaching obsolescence of many of its combat aircraft types. In September 1942 most of these were developed versions of designs that had entered service before the war. The Messerschmitt Bf 109 and Bf 110, the Junkers Ju 87 and Ju 88 and the Heinkel He 111, which equipped the lion's share of the combat units, were near the end of their development lives.

Two important new combat aircraft production programmes, which should have yielded sizable numbers of modern machines, had gone awry. The Messerschmitt Me 210 was to replace the Bf 110 in the long-range fighter, night fighter, fighter-bomber and reconnaissance roles, and also the Ju 87 as a dive-bomber. Yet the new plane's handling characteristics proved to be so bad that the programme had to be abandoned. The Heinkel He 177 four-engined heavy bomber had gone into service with one Gruppe, but its teething troubles were so severe that the type had to be withdrawn for extensive modifications. The only major new types to enter service since the beginning of the war were the Focke Wulf Fw 190 fighter and the Dornier Do 217 medium bomber; neither type was available in large numbers. In the absence of the replacement types

planned for them, most Luftwaffe flying units had to soldier on with their ageing equipment. In stark contrast, each of the opposing air forces was introducing new combat planes that had long development lives ahead of them.

The problems facing the Luftwaffe did not end there. Since the start of the campaign in the East, the losses in aircrew had exceeded those being turned out by the training organization. The reserve of trained crews was exhausted and many units were now under-strength in flying personnel. Other pressures on the training organization exacerbated the difficulty. The Soviet offensive, early in 1942, left German troops surrounded at two points. A large airlift had to be mounted to supply them, using Junkers Ju 52s and instructor pilots drafted in from the flying training schools. These operations lasted until May, when the aircraft and instructors were returned. But, during the following three months, the hectic pace of air operations in all theatres led to a serious depletion of the Luftwaffe reserve of aviation fuel. Cutbacks were ordered in non-essential flying, and again it was the training schools that suffered.

The diversion of aircraft and instructors, coupled with the fuel shortage, disrupted the training of crews to fly multi-engined aircraft. Front-line bomber and long-range reconnaissance units felt the effects of these changes immediately. For the rest of the war there would be a steady deterioration in the training given to new crews. From this point, each time an experienced crew was lost a unit's combat effectiveness fell by a small but measurable amount.

By the summer of 1942 the Luftwaffe was slipping behind its adversaries in each of the main components of air power – in the quantity and quality of its aircraft and in the quantity and quality of its crews. Yet although the future looked bleak for the Luftwaffe in the medium and the long term, in the short term there were some grounds for optimism. In September 1942 the decisive battle for the city of Stalingrad was still going well for the Germans. The action had drawn in huge Soviet forces and these were being systematically destroyed. From the German High Command there were confident assertions that, with the huge losses it had already suffered, the Red Army was on the brink of collapse.

If a victory could be secured on the Eastern Front, the picture would change completely. Then the Luftwaffe could redeploy large forces to the Western and the Mediterranean theatres to stabilize the situation there. And, having established a breathing space, the Luftwaffe would be able to build up its fighting strength.

In October 1942 the area of territory under German occupation was at the greatest it would ever be: it ran from Brittany in France to the Volga river in Russia, from the North Cape of Norway to deep inside Egypt. In each of its campaigns so far the German Army, with powerful support from the Luftwaffe, had been victorious.

Yet although the Luftwaffe was still impressively strong, it was seriously overstretched. The need to provide support for three major but distant

theatres of operations, in the east, in the west, and in the Mediterranean, placed severe strains on its limited resources. There were few combat units in reserve. Thus if a critical situation arose in one theatre, it could be reinforced only at the expense of one or both of the others.

There were other serious problems. Most German front-line units still operated the Bf 109, the Bf 110, the Ju 87 or the He 111, pre-war designs near to or at the end of their development lives. The opposing air forces on each front were numerically stronger and they were fielding more modern aircraft. The Luftwaffe might have been able to overcome these deficiencies in part, had it produced capable new pilots and crews to replace those lost in action. But this was not the case. Its overworked, understaffed and under-resourced flying training organisation was quite unequal to the demands now being made on it. As a result, from the end of 1941, the quality of training given to new crews had declined steadily.

As a result of these deficiencies, by the autumn of 1942 the Luftwaffe found itself slipping behind its opponents in each of the four main ingredients of air power – the quantity and quality of its aircraft and the quantity and quality of its crews.

So long as the battle fronts remained reasonably static the Luftwaffe could maintain its position. This did not last long, however. During the third week in October, British and Commonwealth forces in Egypt launched a powerful offensive at El Alamein. A few days later Allied forces landed in Algeria and Morocco, and began advancing eastward towards Tunisia. The Africa Korps began a lengthy fighting withdrawal that would not end until it had been ejected from Egypt and Libya. At the same time the Luftwaffe initiated a large scale airlift, to rush troops and equipment to establish blocking positions in Tunisia. In the face of the strengthening Allied naval blockade, these forces had to be supplied by air also.

Then in mid-November, as the brutal Russian winter neared its climax, the Red Army launched a major offensive on the southern part of the front. In a large pincer movement it succeeded in isolating the entire German 6th Army at Stalingrad. Rather than allow the beleaguered troops to fight their way out of the trap, Adolf Hitler ordered them to hold their ground – the Luftwaffe would supply them by air. It was a calamitous decision. Already committed to moving men and supplies to Tunisia, the Luftwaffe had now to initiate a second and much larger airlift in Russia. Faced with weather conditions that were often atrocious, the Stalingrad airlift failed. Even on good days it was unable to deliver the 750-ton minimum daily requirement to maintain the 6th Army as an effective fighting force. On 2 February 1943 the last of the starving, shivering, under-supplied German troops in the pocket surrendered. The operation cost the Luftwaffe some 490 transport aircraft and bombers operating in the transport role.

Meanwhile, in North Africa, the Axis forces were squeezed into a narrowing strip of Tunisia under pressure from both the east and the west. The Luftwaffe put up a good fight, but its opponents were superior in numbers and equipment and they enjoyed the advantage of secure lines of supply. The outcome of the campaign

was never in doubt, and in May 1943 Axis resistance in North Africa came to an end.

The twin catastrophes at Stalingrad and Tunisia cost the Luftwaffe severe losses in men and equipment. Yet although the force had taken hard knocks, it retained enormous strength. Adolf Hitler decided that the decisive action on the Eastern Front in 1943 was to be a giant set-piece battle at Kursk in the central sector. During the early part of July, forces were concentrated in readiness for the attack. The Luftwaffe deployed 1,830 aircraft to support the offensive, leaving about 670 to cover the remainder of the theatre. Forewarned by intelligence sources of what was afoot, the Red Air Force moved some 2,900 aircraft to bases within range of the battle area. That service had come a long way since the dark days of 1941, and now many of its units operated modern aircraft as good as or superior to their German counterparts.

The battle opened on 5 July, with both air forces flying high sortie rates and suffering heavy losses. For the first time on the Eastern Front the Luftwaffe concentrated a large proportion of its combat strength to support a major battle, but it was unable to establish air superiority. On the ground, German troops made slow progress before they became bogged down in the 'hedgehog' defensive system established by the Soviets. On 11 July the Red Army launched a powerful counter-offensive north of Kursk, hurling German ground forces in that area on to the defensive. Further strong counter-attacks halted the German advance south of Kursk. By 23 July, having suffered huge losses, German ground forces on the Eastern Front went on the defensive. So ended the last all-out offensive by German troops in that theatre.

In the Mediterranean theatre, too, things were going badly for the Luftwaffe. On 10 July Allied troops landed in Sicily, compelling it to divert forces there . In September Allied forces landed in Italy, and that nation changed sides in the conflict. Germany had lost her only major ally in Europe.

Yet, for the Luftwaffe, the most ominous development during 1943 was the turn of events over the German homeland. The effectiveness of the RAF night-bomber offensive had grown out of all recognition during the first half of the year. Following destructive attacks on targets in the Ruhr industrial area, in July a series of heavy attacks razed large areas of the city of Hamburg. During the same period the US 8th Air Force had grown in strength and it was making progressively deeper incursions to strike at German industrial targets by day.

The need to protect the Fatherland from enemy air attacks assumed paramount importance, and required the stiffening of the home defence fighter and flak forces. To that end several day-fighter Gruppen were withdrawn from the Eastern Front and the Mediterranean, stripping those theatres of effective air defence. At the same time the night-fighter force underwent a steady expansion, imposing a further drain on resources.

On 17 August 1943 the US 8th Air Force launched its most ambitious operation to date: twin strikes on

the Messerschmitt aircraft factory at Regensburg and the ball-bearing production centre at Schweinfurt. Both targets were in the south of Germany, far beyond the reach of the available escort fighters. The newly strengthened German fighter defences reacted forcibly, causing heavy losses. Of the 376 B-17s that set out from England, sixty were lost.

In the weeks that followed, the 8th Air Force confined its attacks to less distant targets for which its escort fighters could provide protection along much of the route. And as larger and better drop tanks became available, the fighters were able to accompany bombers progressively further into Germany.

In a milestone raid on 4 October, Flying Fortresses attacked Frankfurt am Main. More than 200 Thunderbolts escorted the raiders along much of the route and only eight bombers were lost. Near Cologne the P-47s caught some forty Bf 110s moving into position to launch rockets at the bombers. The escorts shot down about fifteen, without loss to themselves. From then on the unwieldy twin-engined bomber-destroyers were restricted to operations east of the line Bremen– Kassel–Frankfurt, to stay out of the reach of the escorts. It was the first tangible sign that the Luftwaffe was losing control of the airspace over its homeland.

During the second week in October the 8th Air Force launched a new series of deep-penetration attacks, culminating in a second attack on Schweinfurt on 14 October. The ball-bearing plants suffered heavy damage. Again the bombers came under sustained attack from German fighters, and again the city lived up to its fearsome reputation as a target. Sixty B-17s were shot down, five more crashed or crash-landed in England and twelve were damaged beyond repair.

Following that action the US 8th Air Force again restricted itself to shallow-penetration attacks, those for which its fighters could provide full-route protection. At the same time it allocated the highest priority to a further expansion of its long-range fighter force, and extending its reach. Towards the end of 1943 the first examples of the Merlin-engined P-51B Mustang fighter arrived in Europe. Carrying two 75-US gallon drop tanks, this remarkable fighter had the range to escort bombers to Berlin and beyond.

The first four months of 1944 saw increasing numbers of American escort fighters accompanying bombers deep into Germany. Two or three times each week the Luftwaffe day-fighter force did battle with a numerically superior enemy operating aircraft of superior performance. For the defenders this period was an unmitigated disaster. At the time Generalmajor Adolf Galland, Luftwaffe Inspector of Fighters, wrote:

'Between January and April 1944 our day-fighter arm lost more than a thousand pilots. They included our best Staffel, Gruppe and Geschwader commanders. Each incursion of the enemy is costing us about fifty aircrew. The time has come when our force in within sight of collapse.'

This was a grim battle of attrition, in which both sides suffered serious

losses. On 6 March 1944, for example, 776 heavy bombers and 644 escorts took part in the first large-scale daylight attack on Berlin. Sixty-nine bombers and eleven escort fighters were lost and 716 US aircrew were killed, wounded, taken prisoner or interned (in Sweden). The Luftwaffe lost sixty-six fighters destroyed or damaged beyond repair, twenty-five pilots killed and twenty-one wounded. Afterwards, both sides easily replaced the aircraft lost from stocks in hand. The US 8th Air Force had replacement pilots and crews in theatre to replace those lost. As if to drive home that point, on 8 and 9 March US bombers returned to Berlin in similar strength. For the Luftwaffe, the position regarding replacement crews was quite different. The forty-six pilots lost to the service on 6 March included several experienced and successful men, and their replacements would be of far lower calibre.

The battle against the RAF night raids took a quite different course. During the autumn of 1943 the Luftwaffe night-fighter force had continued its expansion. As the RAF launched a programme of deep-penetration attacks on targets in Germany, the Luftwaffe introduced new radar equipment and new tactics. That gave the defenders the chance to hit back, and they did so in no uncertain terms. This phase in the action culminated on the night of 30 March, when Bomber Command lost 95 bombers out of 795 sent to attack Nuremberg. It was the greatest ever loss of heavy bombers during a single action.

Also during the early months of 1944, the Luftwaffe launched a series of retaliatory attacks on Great Britain. The bombardment opened on 21 January with an attack on London involving over 400 sorties, with many bombers flying twice. There was a further attack on the capital in January, seven in February and three in March. From mid-March the attacks shifted to other British cities including Hull, Bristol, Portsmouth and Plymouth, before the raids finally petered out in May. The German bomber force took heavy losses during this, its final attempt to mount strategic attacks using manned bombers.

The best hope of defeating the US daylight attacks on Germany was the Messerschmitt Me 262 jet fighter, an aircraft still at the trials stage. This revolutionary aircraft had the performance to outrun the US escort fighters, and its armament of four 30-mm cannon was sufficiently powerful to tear apart a heavy bomber. Large-scale manufacture of airframes had begun in the spring of 1944, even before the Jumo 004 gas turbine that powered it was ready for mass production. A crash programme was launched to improve the engine's reliability and increase its short running life.

The Luftwaffe wanted the Me 262 as a home defence interceptor, but Adolf Hitler had other ideas. In answer to an earlier question, designer Willi Messerschmitt had assured him that the aircraft could be modified without difficulty to carry bombs. Hitler wanted the Me 262 as a high speed fighter-bomber, to help defeat the long-expected Allied invasion of northern Europe. If these aircraft could deliver bombing and strafing attacks on Allied troops

coming ashore, this might delay the establishment of defensive positions by several hours. If German troops could counter-attack before the Allies were ready to meet them, it might be possible to hurl the invaders into the sea (given the near-disaster that would occur at Omaha Beach on D-Day, this analysis was not far-fetched). During the early months of 1944 the Me 262 fighter-bomber featured prominently in the Führer's counter-invasion plans.

In the spring of 1944 the RAF and USAAF units based in Britain began softening-up operations in preparation for the long-planned invasion of France. Among the first targets hit were the Luftwaffe airfields in northern and central France. The raids drove the Luftwaffe from these areas, giving Allied bombers the freedom to attack targets at will.

On 23 May Hitler summoned Göring and senior Luftwaffe officers, including Generalmajor Adolf Galland, to Berchtesgaden to discuss the latest aircraft production programme. When the Me 262 was mentioned, the Führer asked casually how many could carry bombs. General-feldmarshal Erhard Milch, in charge of aircraft production, replied that none could do so – the aircraft was being manufactured solely as a fighter. Milch made matters worse when he said the aircraft needed design changes to enable it to carry bombs, and these would delay its entry into service.

On hearing this, Hitler lost his composure. Bitterly disappointed at losing what he considered to be an important counter-invasion weapon, he was extremely angry when he discovered he had been misled regarding the jet plane's ability to carry bombs. Adolf Galland said the jet fighter was urgently needed to stiffen the homeland's defences, but he was cut short with a sharp tirade.

The upshot of the meeting was that Hitler made Göring personally responsible for seeing that the Me 262 went into service in the fighter-bomber role as soon as possible. Aircraft on the production lines were to be converted to carry bombs and these would have priority for the precious jet engines. Testing of the fighter version could continue, but only if this did not delay deliveries of the fighter-bomber version.

Exactly two weeks after the stormy meeting at Berchtesgaden, on 6 June, Allied troops stormed ashore in Normandy and established beachheads. The Me 262 played no part in that battle – less than forty had been delivered to the Luftwaffe and all were serving with trials units. In truth, the jet plane was not yet ready to go into action *in any role*.

Initially the Luftwaffe's reaction to the invasion was minimal. That force set in motion its plan to transfer several fighter Gruppen to airfields in France. As usual when the Luftwaffe faced a new crisis, the move was at the expense of another area – in this case the home defence fighter force. In the weeks that followed the German units operating in the west suffered fearful losses at the hands of the powerful Allied air forces. Overwhelmed, the Luftwaffe was incapable of providing cover for the sorely tried German army. As one of its soldiers who fought in France complained: 'If the aircraft above us were camouflaged, we knew they were

British. If they were silver, we knew they were American. And if they weren't there at all, we knew they were German!'

At the end of July the first Me 262 fighter-bomber unit, Kommando Schenk with nine aircraft, was deployed to Châteaudun in France. The jet engines were unreliable and the plane's serviceability rate was poor, but at least the Führer had the counter-invasion force he craved. Duped by an elaborate Allied deception plan, Hitler feared the Normandy landings were a diversion and the main blow was still to fall in the Pas de Calais area. If there was a second invasion, the Me 262s were in place ready to meet it. But there was no second invasion. As Allied troops thrust deep into France in August, the jet fighter-bombers withdrew to Germany having achieved little. Soon afterwards the unit was expanded to Gruppe strength (I./KG 51), and it would mount desultory operations in the months to follow.

One further Luftwaffe operation during the Battle of France requires mention. In mid-June it began a large-scale bom-bardment of London using V.1 flying bombs. The onslaught began in earnest on the 15th of the month. From then until the end of August, between 120 and 190 missiles were launched at the capital each day. The RAF moved fighter and balloon units into Kent and Sussex to meet the threat, and belts of AA guns were positioned along the coast. When the new defences were in place they took a heavy toll of the incoming missiles. Of the flying bombs launched, about one-third crashed or were shot down before reaching the coast of England. A further third were shot down or crashed on open country in southern England. The remaining third impacted in the Greater London area, causing widespread damage and serious casualties. Vigorous Allied attempts to locate and destroy the well-camouflaged V.1 launching sites in France had little success. The attacks on the French rail system, part of the air interdiction programme in support of the Battle of France, proved far more effective in reducing the rate of launching. The delivery of missiles to firing units became increasingly haphazard, and sites that had fired their stocks of missiles sometimes had to wait days for the next batch to arrive. In August the advancing Allied ground troops started to overrun the launching sites, and the rate of firing declined rapidly. On 1 September the last flying bomb was launched from France. The initial phase of the bombardment was over. In the months to follow a few of these missiles were air-launched against England from converted Heinkel He 111 bombers, and others were fired from ramps in Holland. These final shots achieved little, however.

While these events had been taking place in the west, on the Eastern Front the Red Army had opened its main summer offensive in the central sector on 23 June. The Soviet planners knew the German infantry and armoured units were in a weakened state, and relied on concentrations of artillery to hold the defence together. They also knew that several fighter Gruppen had been withdrawn from the Eastern Front, and less than 400 single-seat fighters were left to defend the entire theatre. As a prelude to the main offensive, hundreds of Soviet bombers and ground attack planes carried out destructive attacks on German artillery positions. Outnumbered by six to one or more over the battle area, the depleted German fighter force was powerless to intervene.

When the Soviet ground offensive opened, the German counter-attacks without effective artillery support were uniformly unsuccessful. That left the German infantry unsupported, facing powerful Soviet armoured thrusts. As the defences crumbled, the Red Air Force switched to bombing and strafing the retreating columns. The effect was devastating. Faced with massive enemy superiority in each arm, the German front line collapsed at several points. Withdrawal turned to retreat, which quickly degenerated into rout. The Red Army swept westwards, retaking large tracts of territory the Germans had overrun so spectacularly in 1941. When the offensive finally ground to a halt, in October 1944, at some points the Red Army had advanced 300 miles. These advances left Germany's military position on the Eastern Front irretrievably weaker than before. Moreover three of her erstwhile allies – Finland, Rumania and Bulgaria – had been compelled to sue for peace and allow occupation by Soviet forces.

Grievous though it was, even that blow was not the most serious to hit the Luftwaffe during the summer of 1944. Once Allied troops were established in France, the strategic bomber forces switched their attack to the German oil industry. A devastating series of raids on refineries caused a slump in the production of motor and aviation fuels. In April, before the attacks began, monthly production of aviation fuel had peaked at 175,000 tons. In September, it was down to a paltry 7,000 tons. Coming during a period of intensive air operations, this throttling of new supplies led to severe depletions of Luftwaffe fuel stocks. Only by imposing sudden and harsh constraints on almost every aspect of Luftwaffe flying was disaster averted. Day-fighter operations in defence of the homeland were the only ones allowed to continue at their previous level. Most bomber flying was curtailed and many of these units were disbanded. Reconnaissance flights were limited, and offensive operations in support of the army were permitted only in 'decisive situations'. The night-fighter force had its sortie rate much reduced and the flying hours allocated to pilot training were cut further.

At the same time, the Luftwaffe suddenly discovered that it had more fighters than it could use. Using dispersed facilities, the German aircraft industry was concentrating on the manufacture of single-engined fighters. During September, October and November 1944 it turned out more than 8,500 Bf 109s and Fw 190s. Production comfortably exceeded losses and made it possible to add an extra Staffel, the fourth, to each fighter Gruppe. At the same time, by ruthless husbanding of supplies, the Luftwaffe assembled a moderate reserve of aviation fuel. The force was gathering itself for one further

massive onslaught against the enemy, at a time and place of its choosing.

The blow fell on the morning of 1 January 1945, with a large-scale attack on Allied forward airfields in France, Belgium and Holland by about 900 fighters and fighter-bombers. The raiders achieved complete surprise and at six airfields they were successful, destroying numerous aircraft on the ground. At nine other airfields the attacks were less successful, and in three cases the raiders failed to find their intended targets. Due to the strength of the Allied fighter and AA defences, however, the raiders suffered heavy losses.

All told the Allies lost about 200 aircraft destroyed and approximately 100 damaged. Allied pilot losses were less than twenty. Following the arrival of replacement aircraft, the Allied combat units were back to full strength within a couple of weeks. The operation cost the Luftwaffe dear, however. That service lost 237 pilots killed, missing or captured, and 18 wounded. Among these were three Geschwader commanders, six Gruppe commanders and eleven Staffel commanders, experienced combat leaders that were impossible to replace. Surviving German records do not give the number of aircraft lost, but from the pilot losses it seems reasonable to assume they were around 300. Thus the Luftwaffe lost more aircraft than it destroyed, and it lost more than ten times as many pilots as the Allies. The operation left the German piston-engined day-fighter force worse off than ever, bereft of several capable leaders and combat pilots. Some Gruppen never recovered from the losses suffered that day.

Meanwhile what of the Me 262, on which the Luftwaffe had lavished such great hopes? Although the turbojet engine still suffered from technical problems, in September 1944 the design of the Jumo 004 was 'frozen' to allow mass production to begin. Also during that month, Adolf Hitler rescinded his order giving priority of production to the fighter-bomber version of the Me 262. Several commentators have blamed Hitler's order for the long delay in bringing the jet fighter into operational service in quantity. Examination of German records reveals that this was not the case, however. Because the turbojet engine entered mass production at about the same time as Hitler revoked his edict, the latter did not cause any large-scale diversion of aircraft away from the fighter force.

From October 1944 the fighter version of the Me 262 was leaving the production lines in reasonable numbers and thereafter there was no shortage of these aircraft. Yet despite the top priority status accorded to bringing the jet fighter into action in force, it was March 1945 before this began to happen. Several factors conspired to bring about this delay. Me 262 serviceability was poor, mainly but not exclusively due to the problems with its engines. Bad weather during the winter of 1944–5, and Allied fighter sweeps deep into Germany when the weather was fine, disrupted the pilot conversion training programme. Systematic air attacks on the German road, rail and canal systems imposed hold-ups in the delivery of fuel, spare parts and equipment to the units. And on top of all that, any airfield discovered

to be operating jet aircraft became the subject of repeated bombing attacks.

By April 1945 the Luftwaffe had taken delivery of more than 1,000 Me 262s, but only about 200 were serving with combat units. The largest air action involving Me 262 fighters took place on 10 April 1945. Yet even on that day only 55 jets took off, to engage a force of more than 2,000 US heavy bombers and escorts attacking targets in the Berlin area. The Me 262s destroyed ten B-17s and seven escorts, but in securing this unimpressive score they took a fearful drubbing: twenty-nine Me 262s were destroyed in air combat, more than half of those committed. Twenty-one jet fighter pilots were killed and seven wounded. Given the overwhelming odds facing them, it is not surprising that the jet fighters failed to secure decisive results.

The Me 262 was not the only German jet aircraft type to see combat. The larger Arado Ar 234 proved highly successful as a reconnaissance aircraft, operating with near-impunity over Allied territory in western Europe and Italy. This type also went into action in small numbers in the bomber role, though the small tonnage of bombs carried by raiding forces limited its effectiveness. The Messerschmitt Me 163 rocket fighter served as a target defence interceptor but due to its short radius of action, about 25 miles, it too was of limited value. The cheap and simple Heinkel He 162 jet fighter saw action during the final days of the war but it was too late to have any impact.

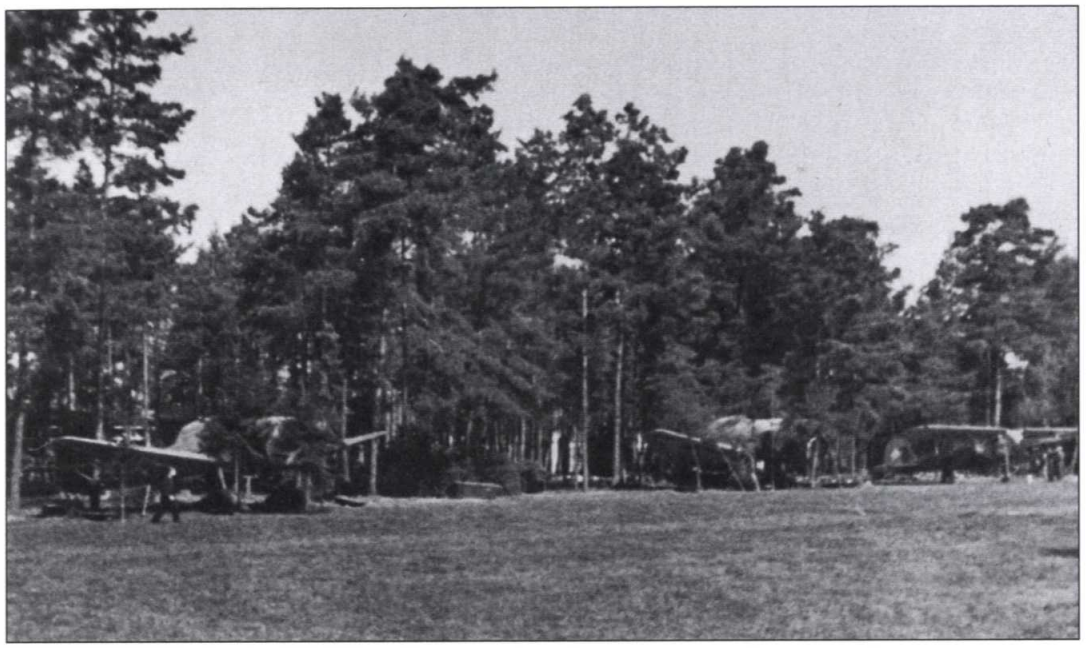
During April and the early part of May 1945 the Allied ground forces thrust deep into Germany from the east and west. Luftwaffe combat units were squeezed into narrowing pockets in Bavaria and Austria in the south, and Schleswig-Holstein and Denmark in the North. At the time of the cease-fire the force still possessed some 3,500 combat aircraft, but most of them sat in camouflaged hideouts with empty fuel tanks. The Luftwaffe had fought valiantly against steadily lengthening odds, and had suffered heavy losses in the process. When it succumbed, it was overwhelmed by pressures over which it had little control.

ACKNOWLEDGEMENTS

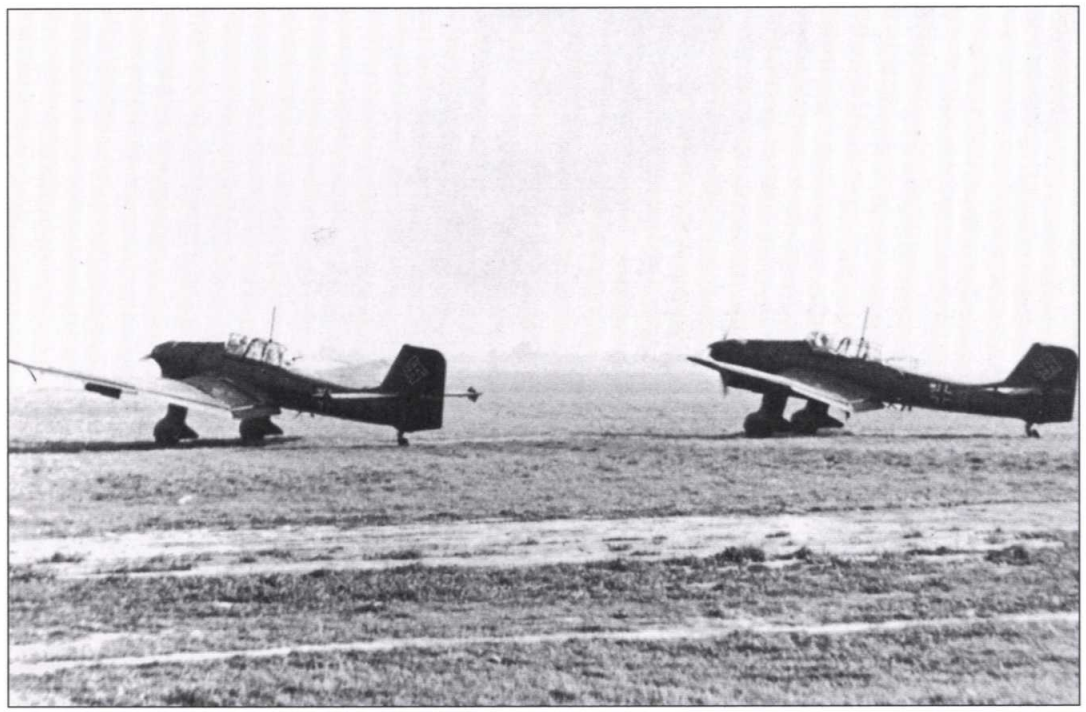
It would have been impossible to assemble the material for this book had it not been for the generosity of those who so kindly allowed me the use of their photographs. In particular I should like to thank Hanfried Schliephake, Gerhard Schöpfel, Robert Michulec, Günther Unger, Hajo Hermann, Oskar Romm, Willi Herget, Fritz Stehle, Günther Heise, Kurt Scheffel, Bernard Jope, Hans-Georg Bätcher, Otto Schmidt, Horst Götz, Julius Neumann, Helmut Wenk, Theodor Rehm, Robert Kowalewski, Werner Schrör, Helmut Mahlke, Diether Lukesch, Horst Schultz, Werner Haugk, Wolfgang Dierich and Helmut Bode. To all of these gentlemen, I tender my grateful thanks.

POLAND, DENMARK, NORWAY, BELGIUM, HOLLAND, FRANCE

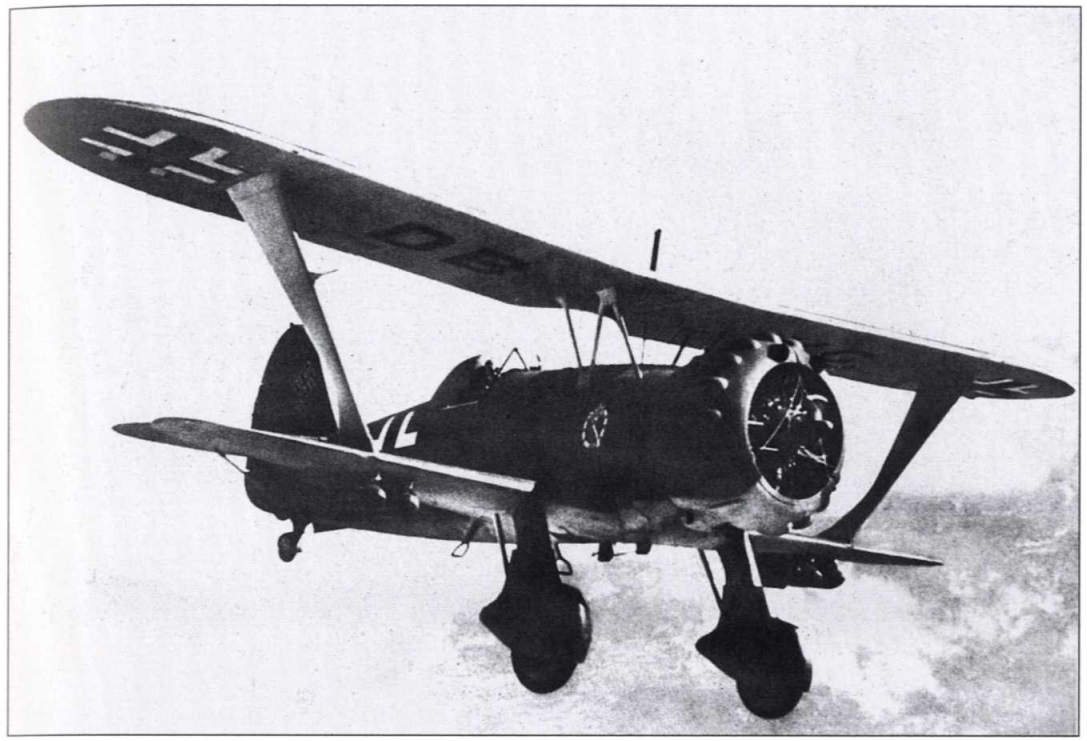
SEPTEMBER 1939 TO JUNE 1940



Junkers Ju 87s of Ist Gruppe of Sturzkampfgeschwader 77 (I./StG 77), together with a Fieseler Storch, under camouflage at their forward base at Oppeln in Silesia, during the final week of August 1939, as Luftwaffe crews awaited the final order to go to war. Scheffel



A pair of Stukas of I./StG 77 taxiing out from Oppeln to attack a target in Poland on the morning of 1 September 1939, the first day of the war. Scheffel

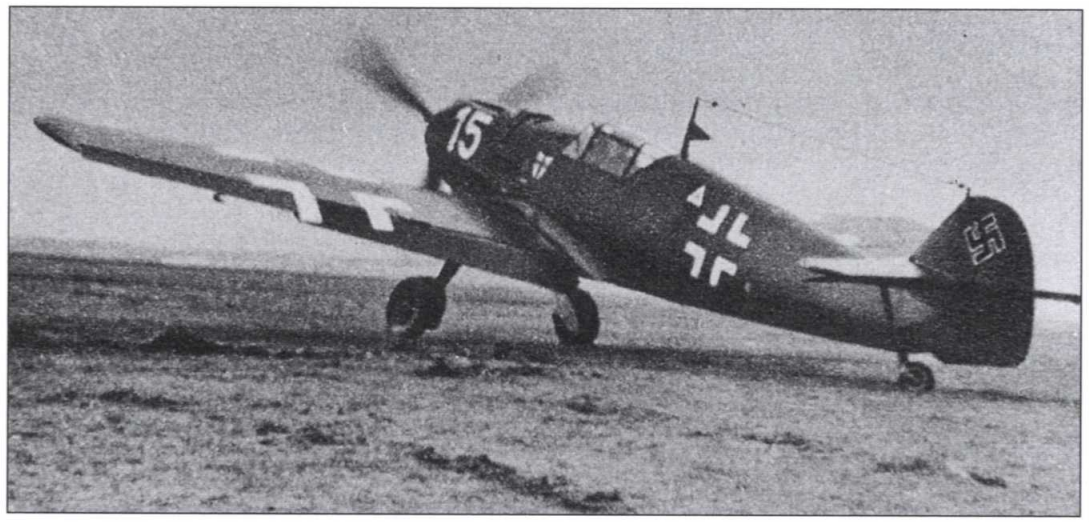


A Henschel Hs 123 ground attack aircraft. Despite its outdated appearance, this type proved effective for strafing ground targets and providing close air support for German troops during the campaign in Poland. via Schliephake

Heinkel He 46 short-range reconnaissance and army co-operation planes, pictured before the war. Thanks to the air superiority achieved by the Luftwaffe over Poland, this low performance aircraft was able to operate effectively throughout the campaign.

Messerschmitt Bf 109Cs of Jagdgruppe 102 (JGr 102), summer 1939.

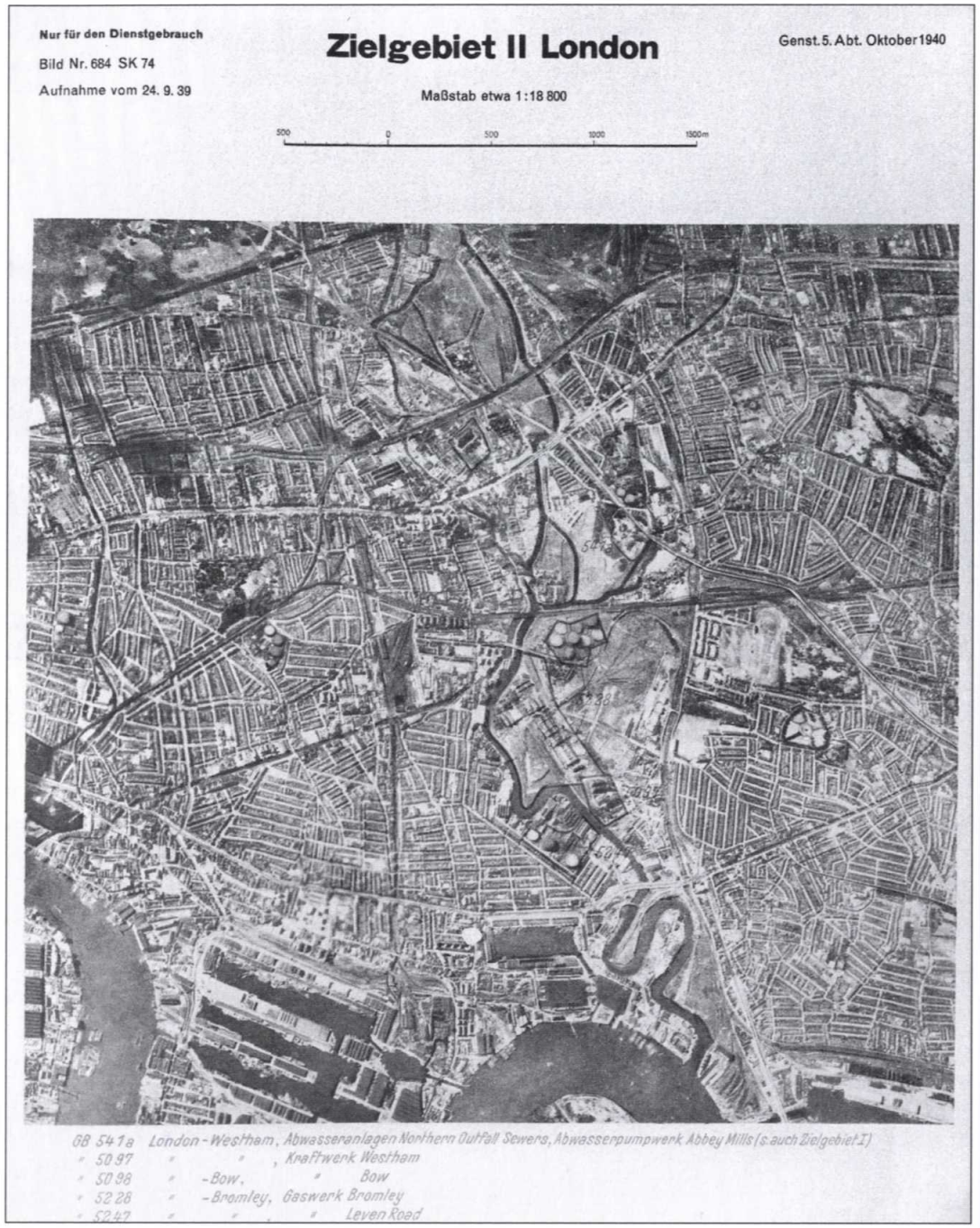
A pilot boards a Bf 109E bearing the 'Scalded Cat' insignia of Jagdgeschwader 20 for a scramble take-off, summer 1939. A mechanic had started the engine before the pilot reached the cockpit.



Bf 109E of JG 27, early in the war. The oversized wing markings served as an additional aid to recognition, following a series of unfortunate incidents when aircraft were engaged in error by 'friendly' forces. Both sides lost aircraft to this cause. via Schliephake

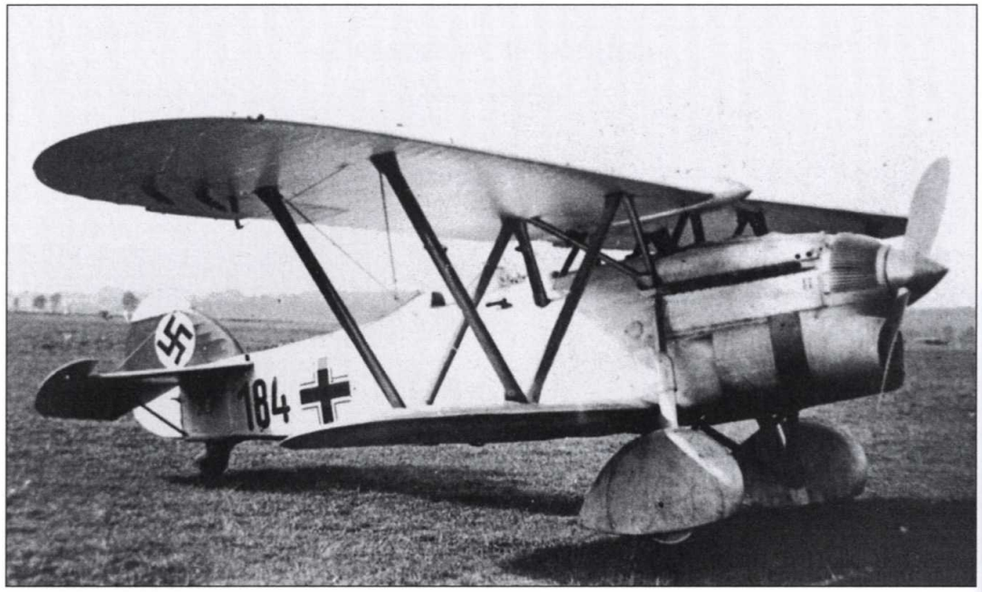
Ground crewmen reloading the wing and engine-mounted 7.9 mm machine-guns of a Bf 109C of IIIrd Gruppe of Jagdgeschwader 51 (III./JG 51). Scrupulous cleanliness was necessary for this operation, since any grit or dirt adhering to the rounds might cause a stoppage during firing.

Formation pair take-off by Bf 109Cs of JG 51.

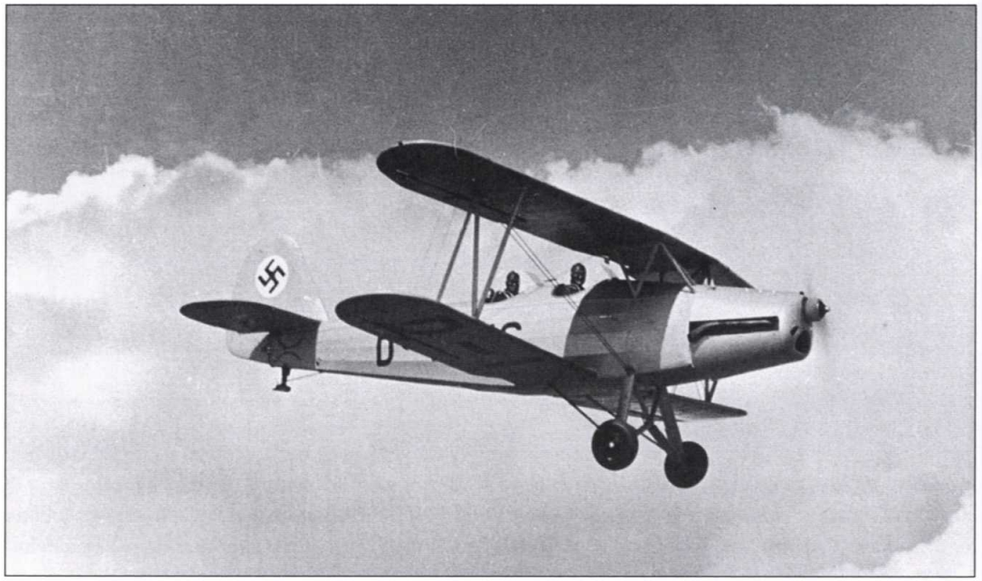


Reconnaissance photograph of the Bromley-by-Bow and Poplar areas of London, taken during a mission flown on 24 September 1939. The photographic aircraft was probably a Do 17P. At the bottom of the photograph the River Thames and the West India Docks can be clearly seen.

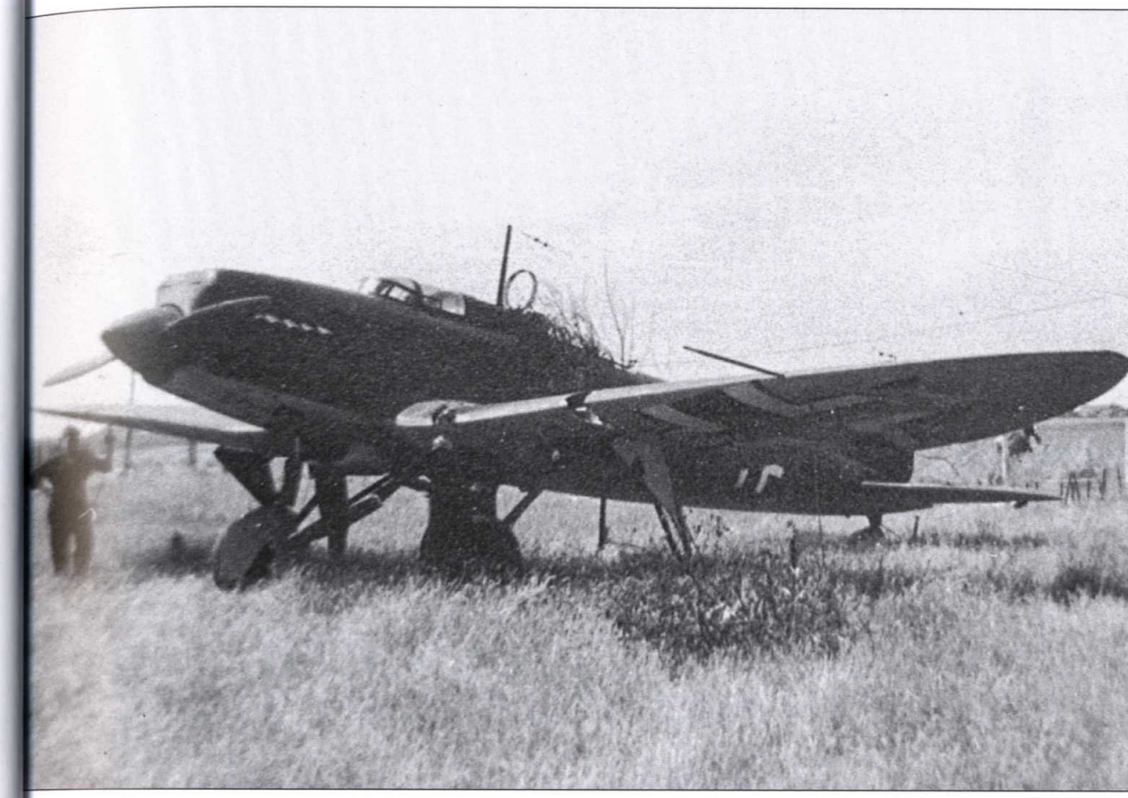
Dornier Do 17P reconnaissance aircraft of Aufklärungsgruppe 22 (Aufkl.Gr 22). Operating from bases in western Germany, this unit flew numerous sorties to photograph defended areas in France, Holland and Belgium in preparation for the German offensive in May 1940. Its aircraft also operated over Great Britain, taking pre-strike photographs of targets.



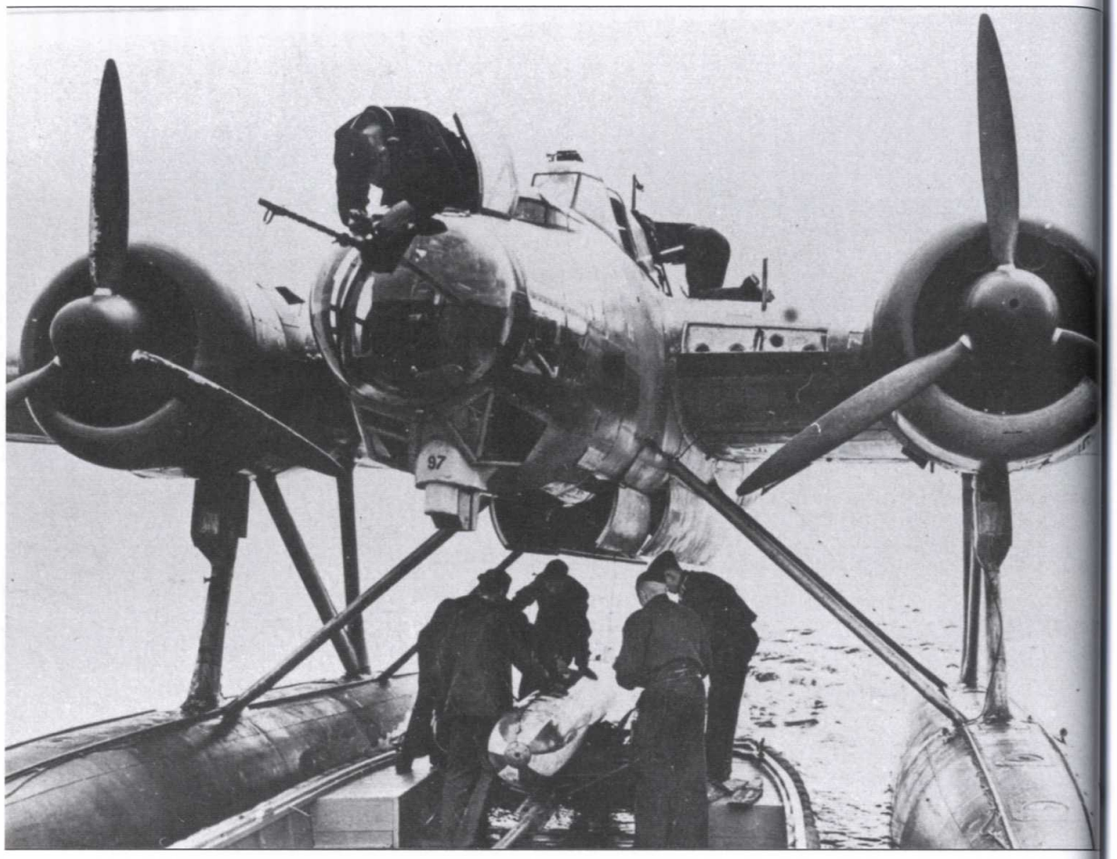
The Italian-built Fiat CR 32 was the main fighter type used by the Austrian Air Force, before that service was incorporated into the Luftwaffe in 1938. From then on these aircraft served in the advanced trainer role. via Michulec



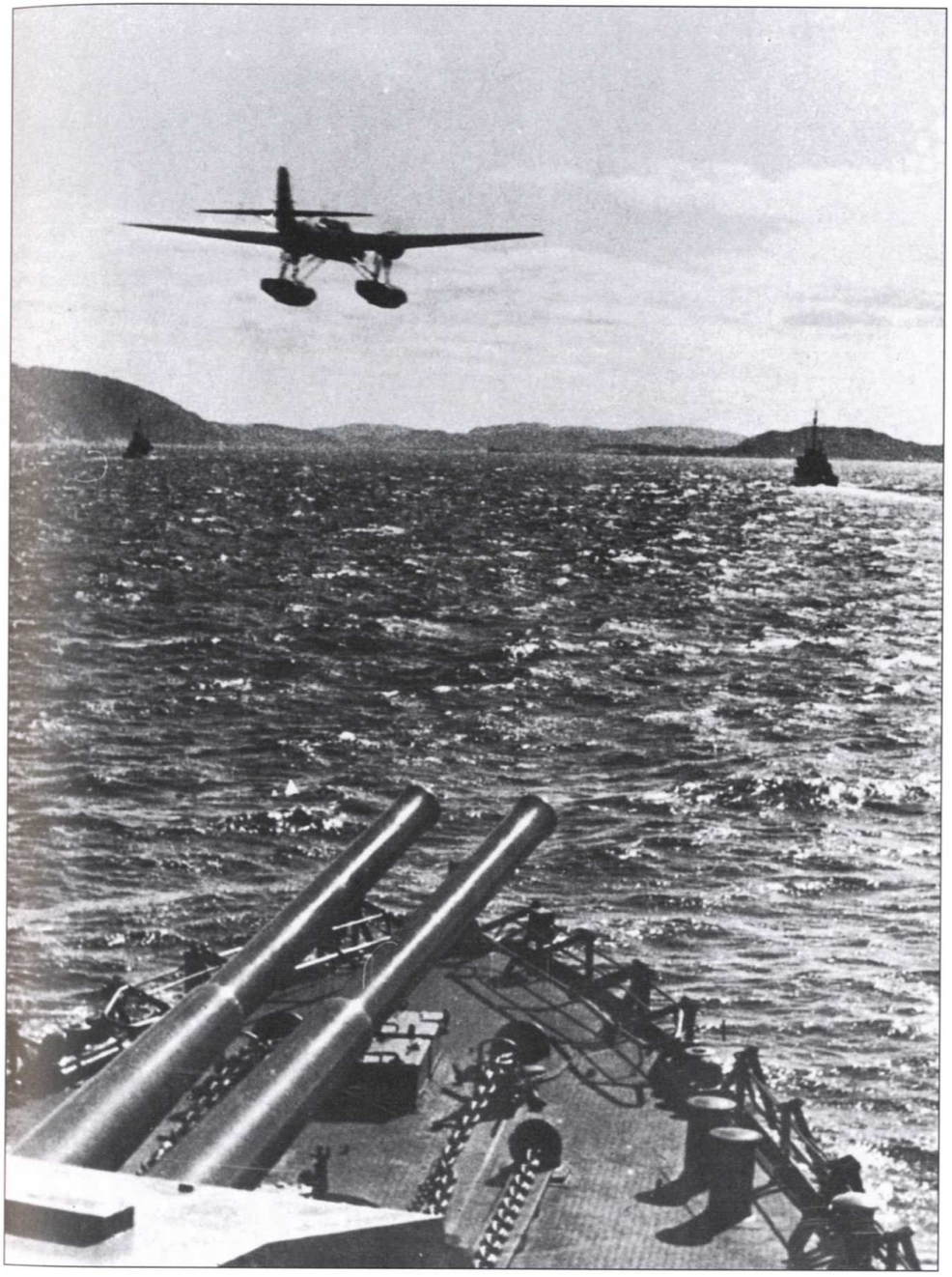
The Gotha Go 145 initial trainer served in large numbers at Luftwaffe flying schools.



By the beginning of the war the Heinkel He 70 reconnaissance aircraft had passed out of front-line service, but continued to serve in small numbers as trainers and courier planes.

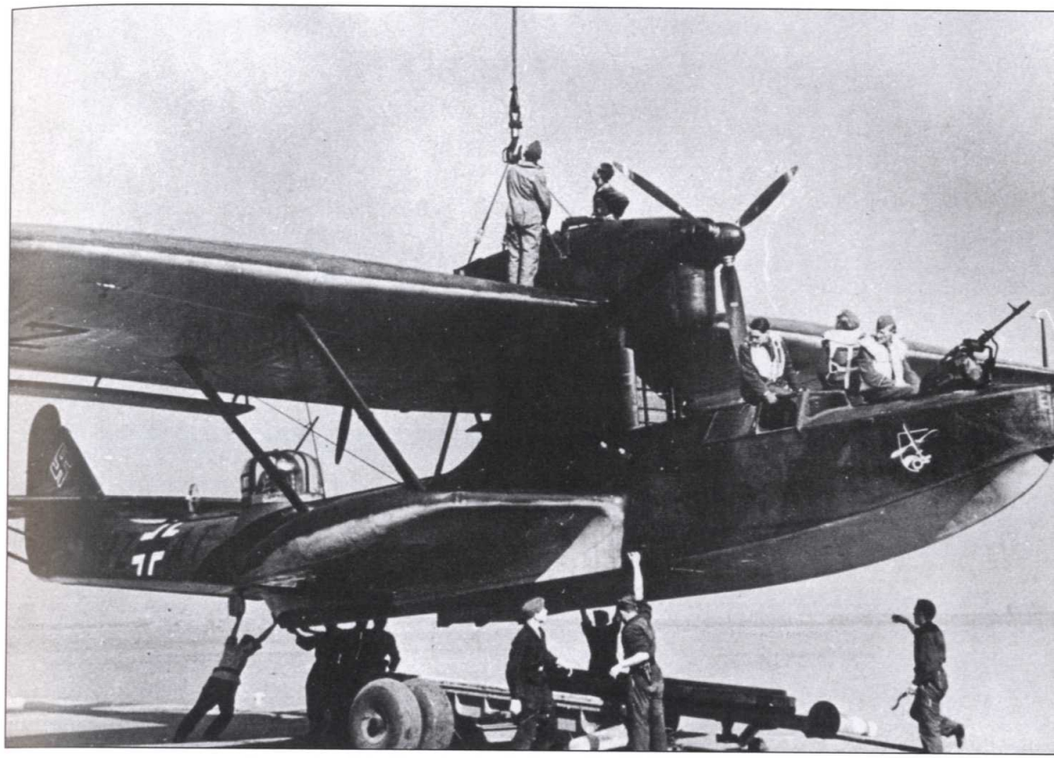


Loading a practice torpedo into the weapons bay of an He 115 during the type's operational evaluation at the Luftwaffe test centre at Travemünde on the Baltic. This relatively slow aircraft was the main torpedo bomber type in the Luftwaffe during the early war years. Due to the poor reliability of the German air-dropped torpedoes at that time the type achieved little in the role. The He 115 served more effectively in the minelaying and maritime reconnaissance roles. via Michulec



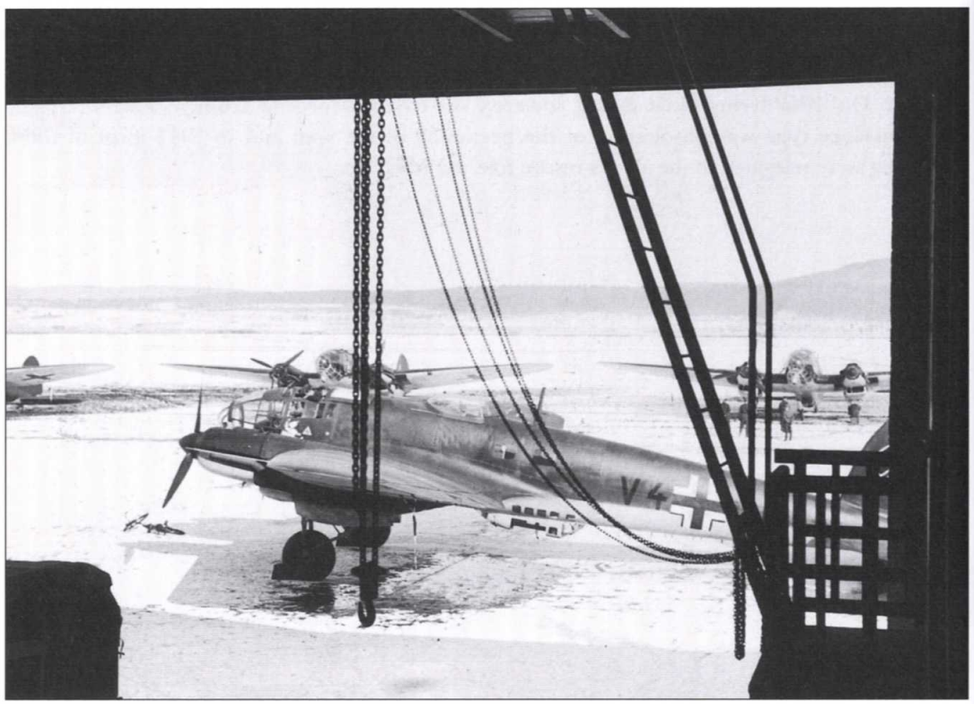
Heinkel He 115 floatplane passes low over German warships on exercise.

Engines running, an He 115 is lowered down to the water before a flight. via Michulec



Dornier Do 18G flying boat being lowered on to its beaching trolley. This maritime reconnaissance type was obsolescent at the beginning of the war, and in 1941 most of those remaining were relegated to the air-sea rescue role. via Michulec

Dornier Do 17s of Kampfgeschwader 3 being prepared for an operation.

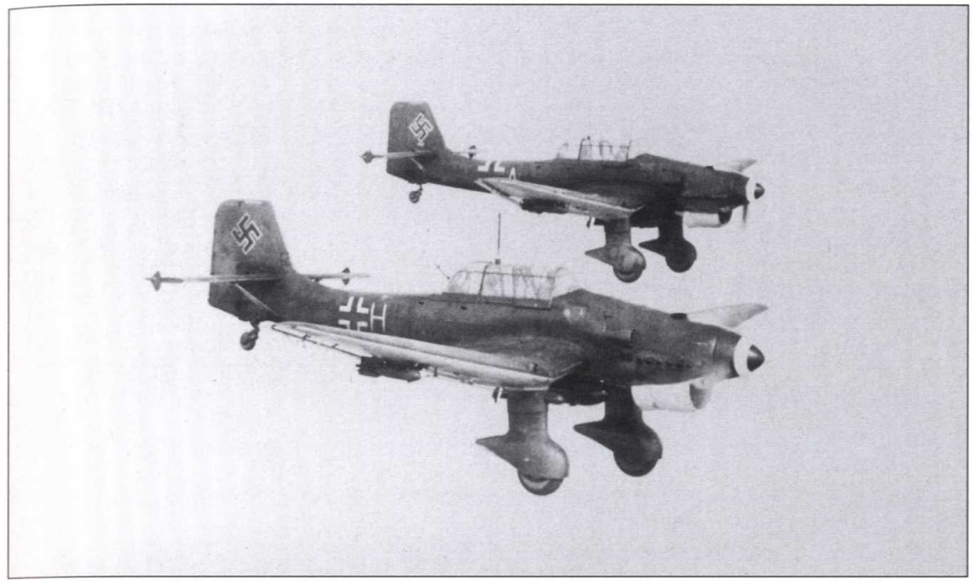


Heinkel He 111s of KG 1, probably at their main base at Greifswald during the first winter of the war.

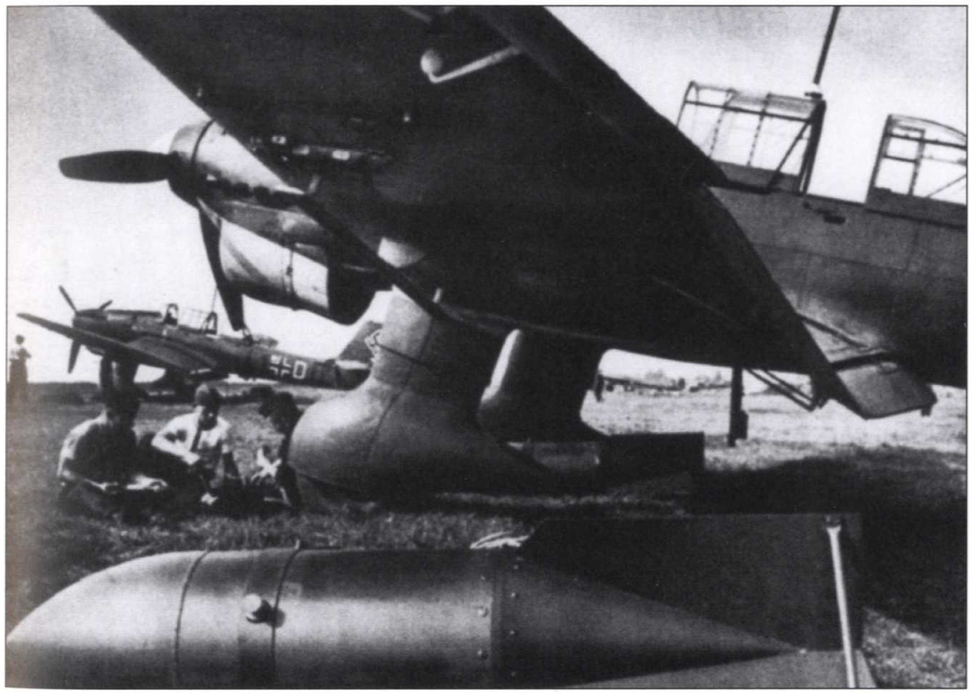
Armourers of KG 3 moving SC 50 (110-pound) bombs into position, before loading them on a Do 17.

He 111s of KG 26 during operations from Lake Tonsvannet near Trondheim, during the campaign in Norway. von Lossberg

Loading an SC 250 (550-pound) bomb on the fuselage rack of a Ju 87.

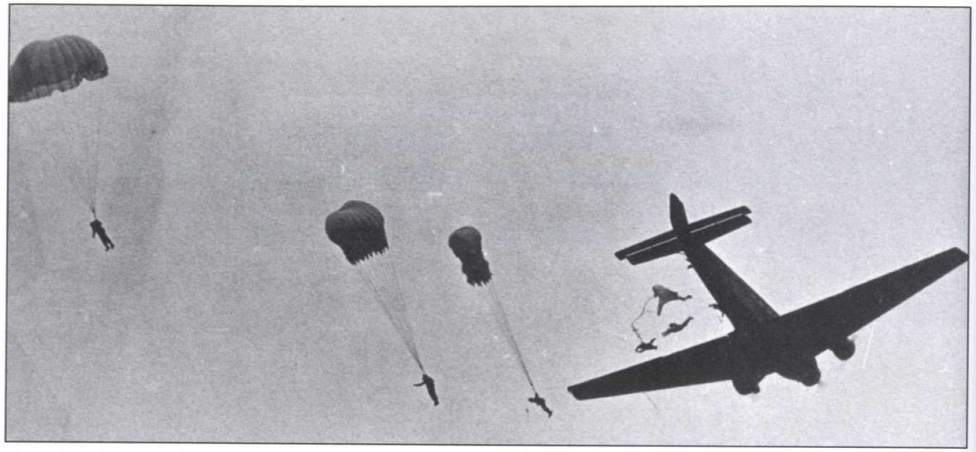


Junkers Ju 87 dive bombers of Lehrgeschwader 1. Although the unit's title implies that it had a training role, in fact it was a high-grade fighting unit, with experienced crews who were tasked with developing tactics for use with each of the main combat types.

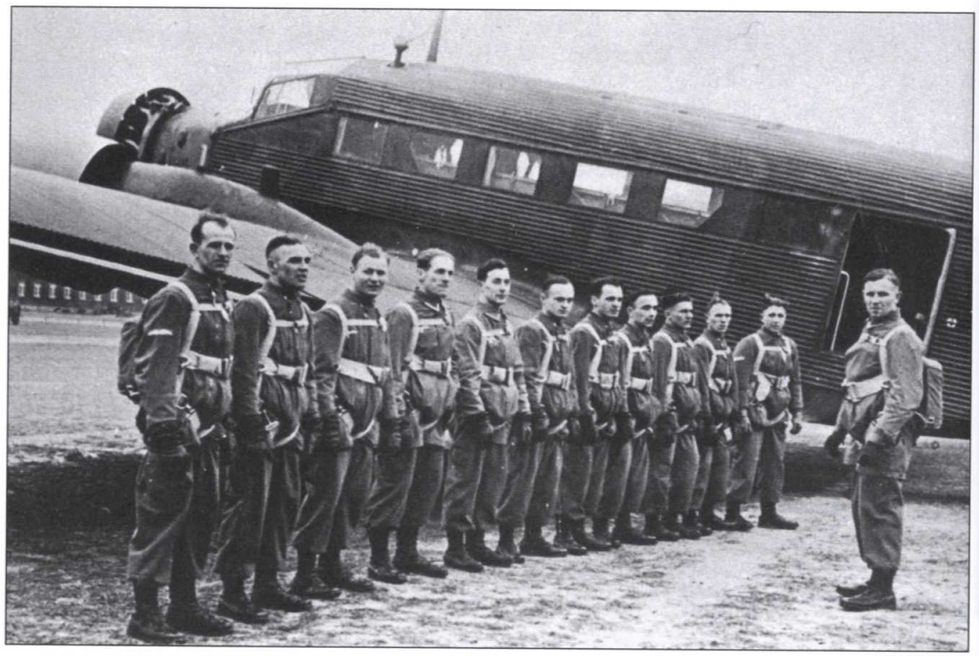


Practice formation flown by Ju 87s of Trägergruppe 186 (Tr.Gr 186), spring 1940. This unit had been formed to operate from the German aircraft carrier *Graf Zeppelin*, which was then being

fitted out at Kiel. This Gruppe flew combat missions alongside other units, and when the carrier programme was cancelled it became a normal front-line unit. Bode



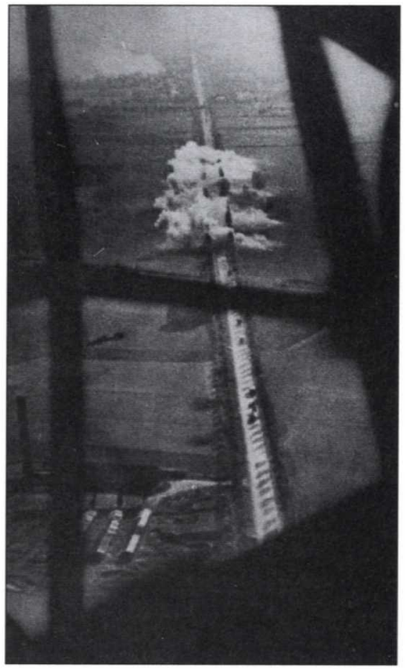
In 1938 the embryonic German paratroop force was incorporated into the Luftwaffe, which controlled all airborne operations from then on. The first use of these units in action was on 9 April 1940, during the invasion of Denmark and Norway. Paratroops are seen here leaving their Junkers Ju 52. The three-engined machine was the main workhorse of the Luftwaffe air transport force throughout the war. Normally it carried up to twelve fully equipped paratroops, or up to 3,300 pounds of cargo. via Michulec



A section of a dozen paratroops parade in front of their Ju 52 transport, before boarding the aircraft for a practice jump. via Michulec

During the campaign in Norway the Luftwaffe also transported army units into airfields captured by the paratroops. Here men from a mountain division don their kit before moving away from their aircraft. via Michulec

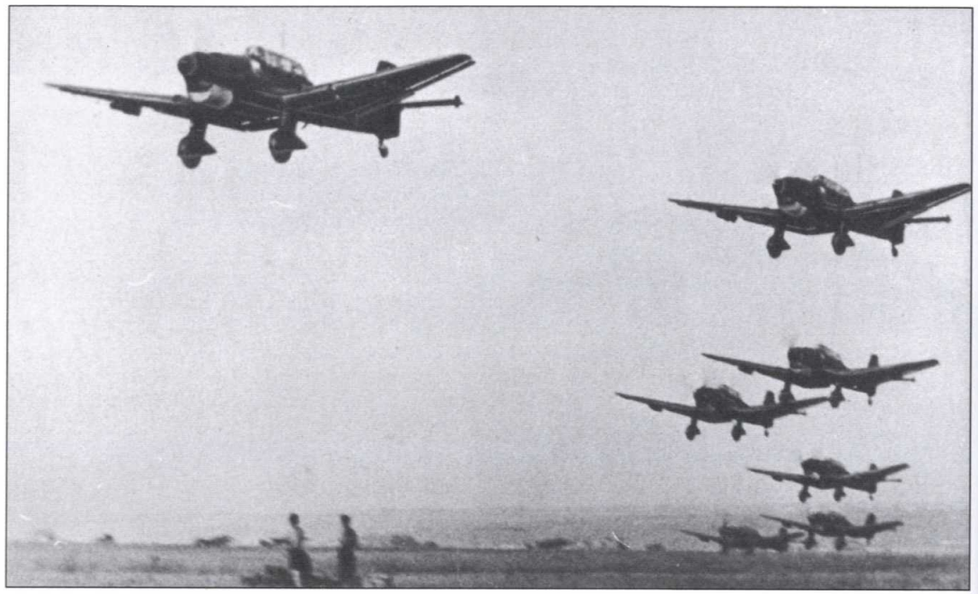
German paratroops wave greetings to one of the Stukas that provided them with such effective support during the airborne assault on Holland.



A road convoy under attack in France, viewed from the nose of a Dornier Do 17.

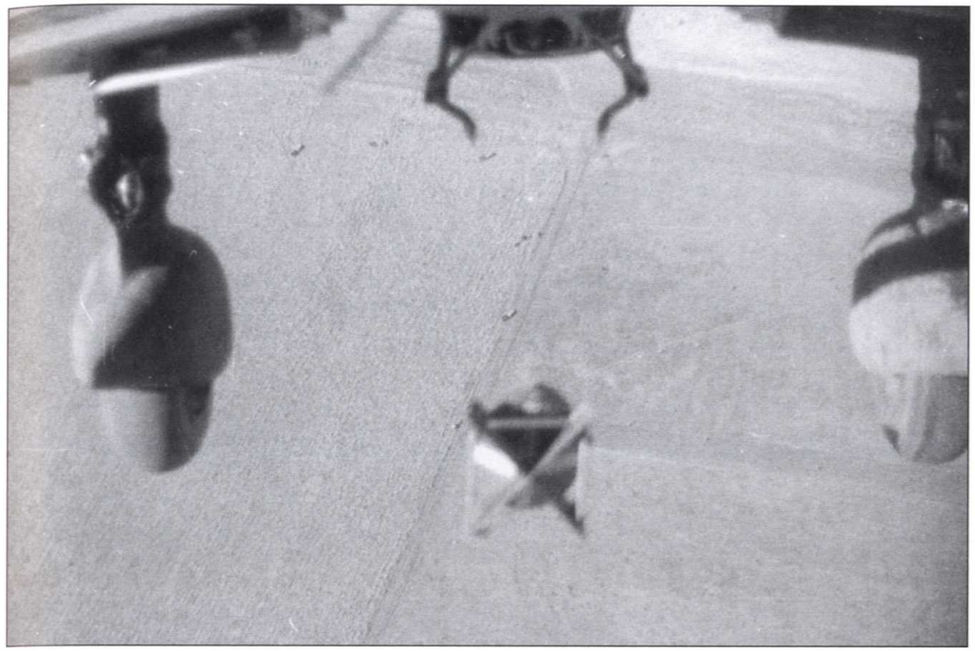
Do 17 of IInd Gruppe of KG 76, fitted with 20 mm cannon in the nose for strafing ground targets. Raab

Ground strafing was a dangerous business for friend and foe alike. On 17 May 1940 this Do 17 of II./KG 76 was strafing a French road convoy when an ammunition truck exploded violently. The German bomber suffered extensive damage, but the pilot, Unteroffizier Otto Stephani, was able to make a normal landing at his base at Vogelsang. The Dornier never flew again. via Rehm



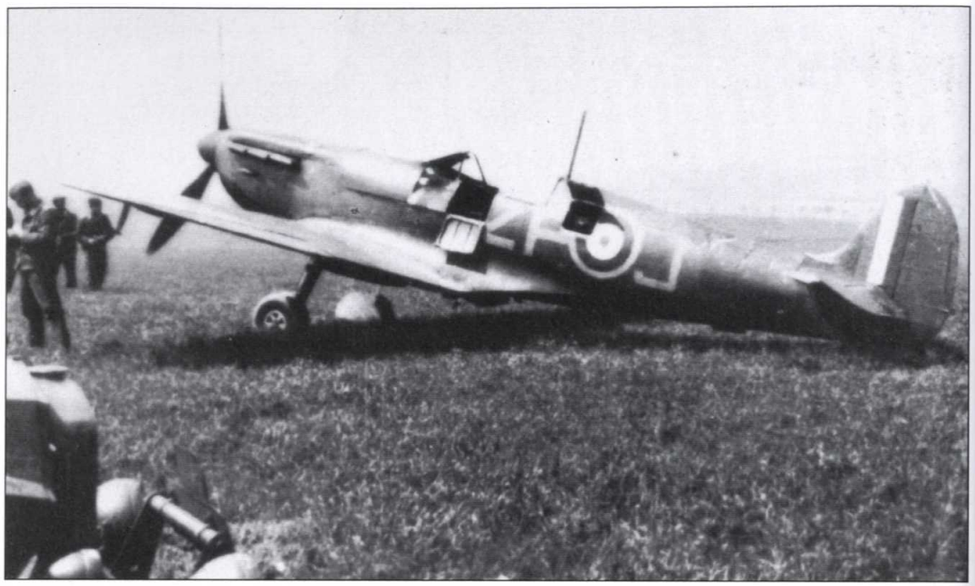
Ripple take-off by a Staffel of Ju 87s. Operational missions often took the Stukas close to the limit of their radius of action. To make the most of the aircraft's limited range it was important to assemble the formation as soon as possible after the leader took off. Where range was critical the aircraft were towed or taxied into position in line abreast at the down-wind end of the airfield, with the leader on the far left. There the engines were warmed up, shut down, and the tanks topped off. At the briefed time the engines were restarted, the leader commenced his take-off run and the other aircraft followed in rapid succession. The aircraft took off parallel headings to keep out of the slipstream and any dust raised by the one ahead. Once the leader was airborne he made a slow turn on to the target heading, flying slowly to allow the rest of the aircraft to move into their assigned places in formation behind him. Once the formation had assembled, the leader increased power and began the climb to attack altitude.

Ju 87s often had to operate from ill-prepared field landing grounds and it was fairly common for an aircraft to dig in a wheel on landing and end up standing on its nose. This aircraft of I./StG 77 assumed the undignified position after landing at Le Mesul-Angat in Normandy. Scheffel



SC 250 bomb (550-pounder) viewed immediately after release from a Ju 87. Having pushed the bomb clear of the airscrew disk, the special crutch mechanism has been pushed back by the airflow and now hangs below the fuselage.

Ju 87s of I./StG 77 camouflaged at their dispersal points at Courcelles, near St Quentin during the campaign in France. Scheffel



Luftwaffe personnel examine a Spitfire of No. 74 Squadron, which had been abandoned intact at Calais Marck airfield. Barbas

Aircrew of KG 76 inspect the wreck of an RAF Hurricane that lay abandoned at their airfield at Beauvais. Remm

Wrecked French military aircraft at the airfield at Escarmain, following its capture by German forces. Unger

Officers of KG 76 outside Notre-Dame Cathedral, Paris on a sightseeing tour following the victorious conclusion of the campaign in France.

A direct hit on one of the ships taking part in the Dunkirk evacuation on 1 June 1940, during an attack by Stukas of I./StG 77. Scheffel

During the campaign in the West the Henschel Hs 126 equipped almost all short-range reconnaissance units.

THE BATTLE OF BRITAIN

JULY TO DECEMBER 1940

Generalfeldmarschall Albert Kesselring, second from left, was commander of Luftflotte 2 during the Battle of Britain. In the First World War he served in the army and rose to become adjutant of a brigade. An extremely capable administrator, he transferred to the Luftwaffe in 1933 and became head of its administrative office. In the years to follow he advanced rapidly and by the summer of 1940 he was in command of Luftflotte 2, the largest of these formations. From his headquarters in Brussels he controlled all units based in Holland, Belgium and France east of the Seine. A German officer of the old school, Kesselring was firm but always courteous with subordinates and greatly respected. To the left of Kesselring is General Jeschonnek, Chief of Staff of the Luftwaffe. On his right are General Speidel, Chief of Staff of Luftflotte 2, and General Bruno Loerzer, commander of Fliegerkorps II. von Lossberg

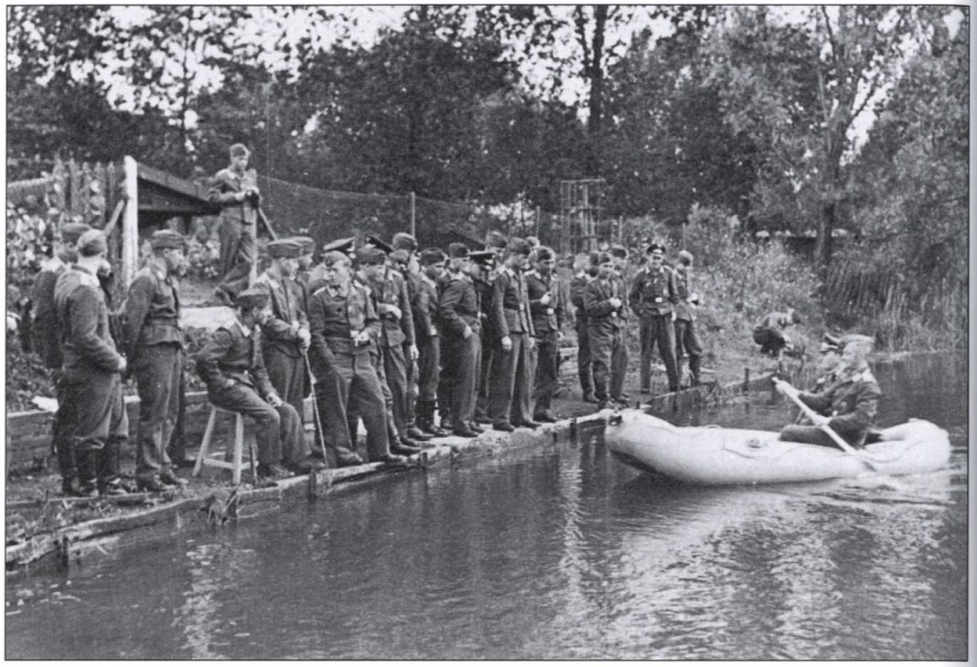
Generalfeldmarschall Hugo Sperrle, right, commander of Luftflotte 3 during the Battle of Britain. His formation comprised Luftwaffe units based in south-west Germany and France west of the Seine. In the First World War he served in the Imperial Flying Service, and transferred to the army after the conflict. In 1935 he moved to the new Luftwaffe and the following year commanded the Legion Kondor, sent to fight in the Spanish Civil War. In contrast to Kesselring, Sperrle was an aloof figure and a stickler for protocol. Hitler referred to him as 'one of his most brutal-looking generals'. via Dierich

Bf 109 pilots of IIIrd Gruppe, Jagdgeschwader 26. From left to right: Leutnant Lüdewig, Leutnant Heinz Ebeling, Oberleutnant Gerhard Schöpfel, Oberleutnant Josef Haiböck and Leutnant Hans Nauman. Schöpfel

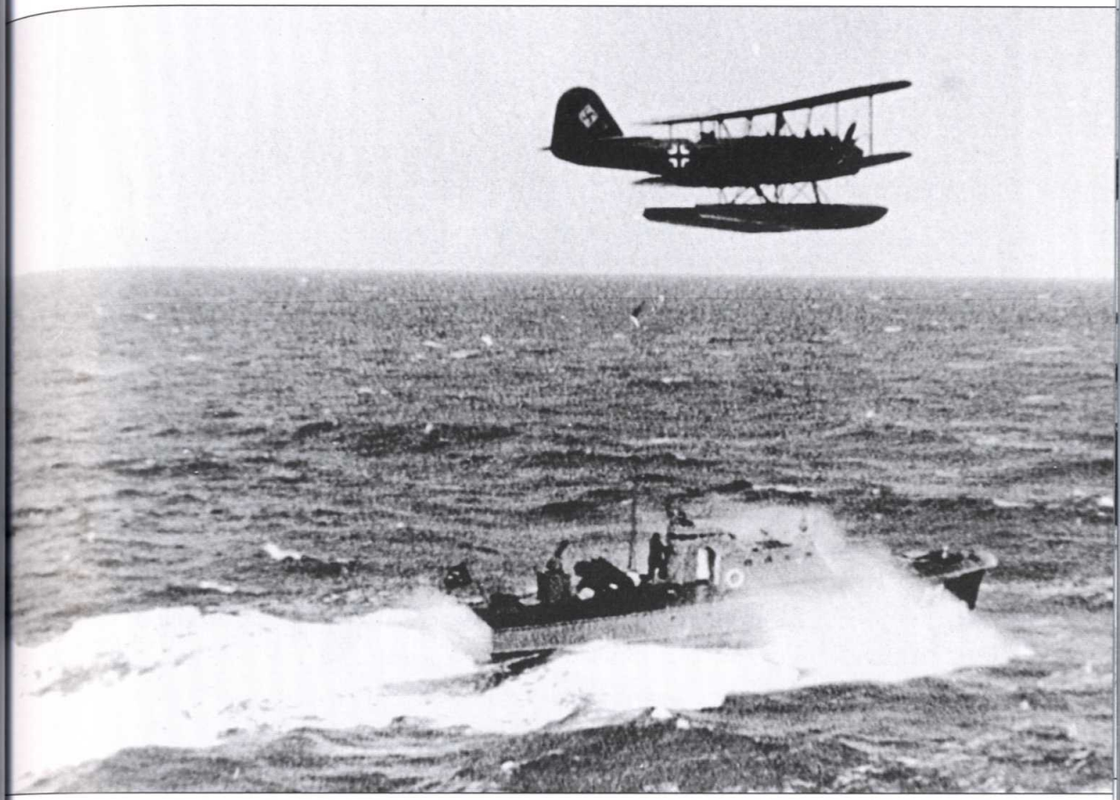
Newly delivered replacement Bf 109 'Emils' for JG 26, France, 1940. They are being painted in the markings and colour scheme used by the unit.

Officers of III./JG 26 discussing the unit's next mission, outside the headquarters caravan at the airfield at Caffiers, near Calais. Seated second from left is the unit commander, Major Adolf Galland. To his immediate left is Gerhard Schöpfel. Schöpfel

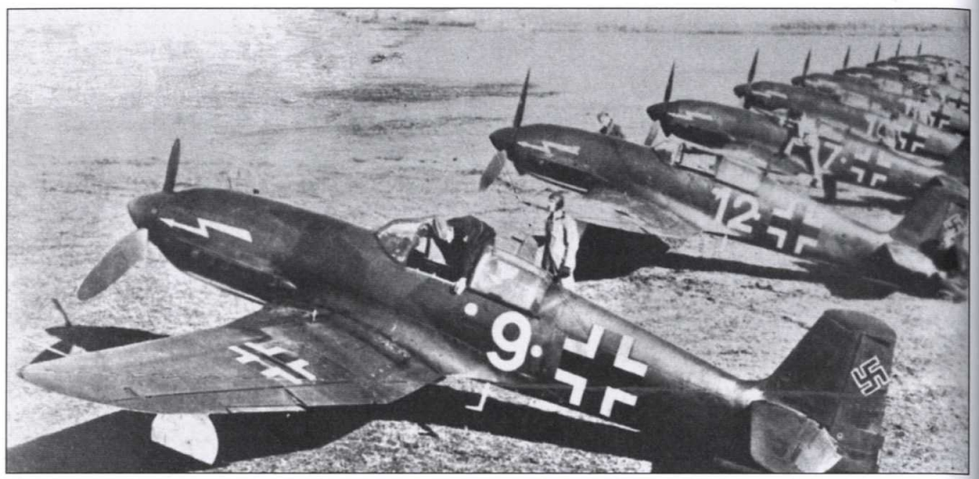
The Heinkel He 59, an obsolete torpedo bomber floatplane, operated in the air-sea rescue role during the Battle of Britain. Initially these aircraft were painted in white all over and carried prominent red cross markings to indicate their non-combatant role. The RAF did not recognize this status, however, and pilots were ordered to attack the floatplanes on sight. Thereafter, the Heinkels were camouflaged and carried machine-guns for self-protection. via Schliephake



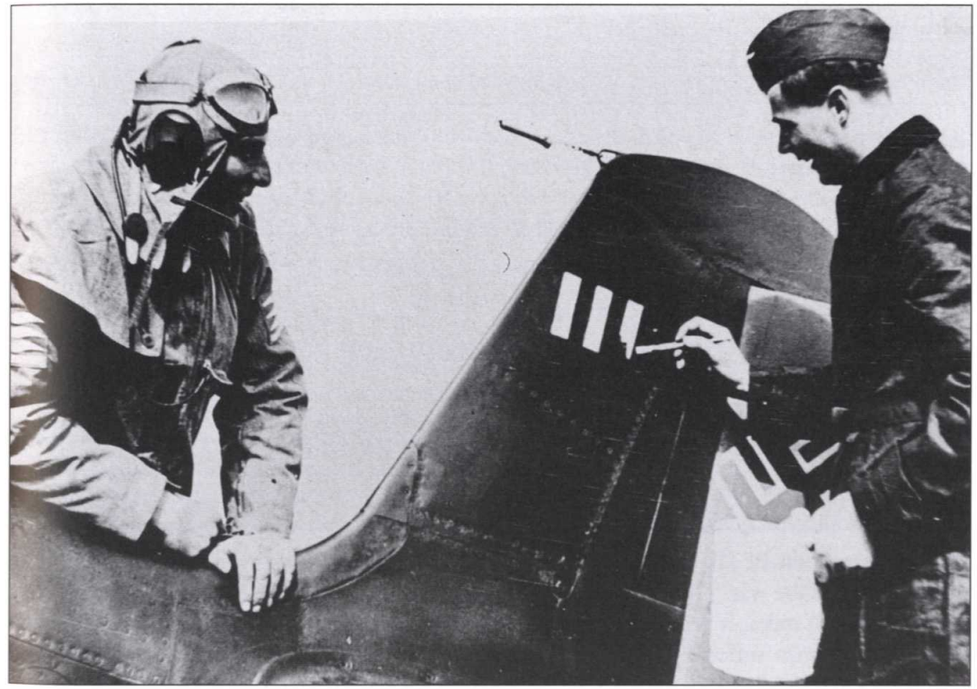
Aircrew of KG 76 trying out one of the rubber dinghies fitted to their aircraft, during preparations for the Battle of Britain. In 1940 the sea-survival equipment issued to Luftwaffe aircrew was far better than that provided by the RAF. Rehm



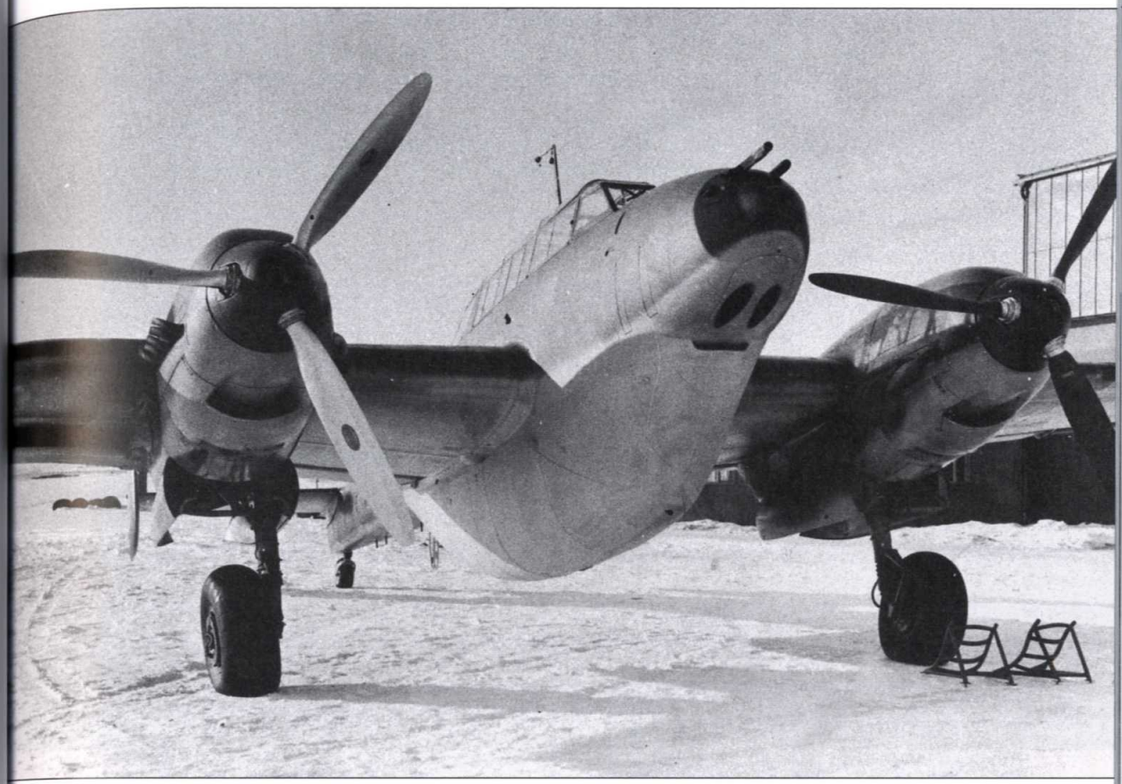
A camouflaged He 59 floatplane flies low over a rescue launch during an exercise. During the Battle of Britain the two worked in concert to rescue aircrew from both sides.



Intelligence Hoax. Before the war the Luftwaffe had rejected the Heinkel He 100 in favour of developed versions of the Bf 109. The Heinkel fighter was offered for export, however. In the spring of 1940 nine He 100s were employed in a remarkable hoax intended to convince the Allied intelligence services that the He 113, a new high-performance fighter, had entered service. The aircraft were photographed in lines, bearing bogus unit markings and victory bars. The hoax was successful, and during the Battle of Britain RAF pilots reported numerous combats with 'He 113s'. Strangely, although several of these fighters were claimed shot down, no wreck of one was ever found in Britain. via Schliephake



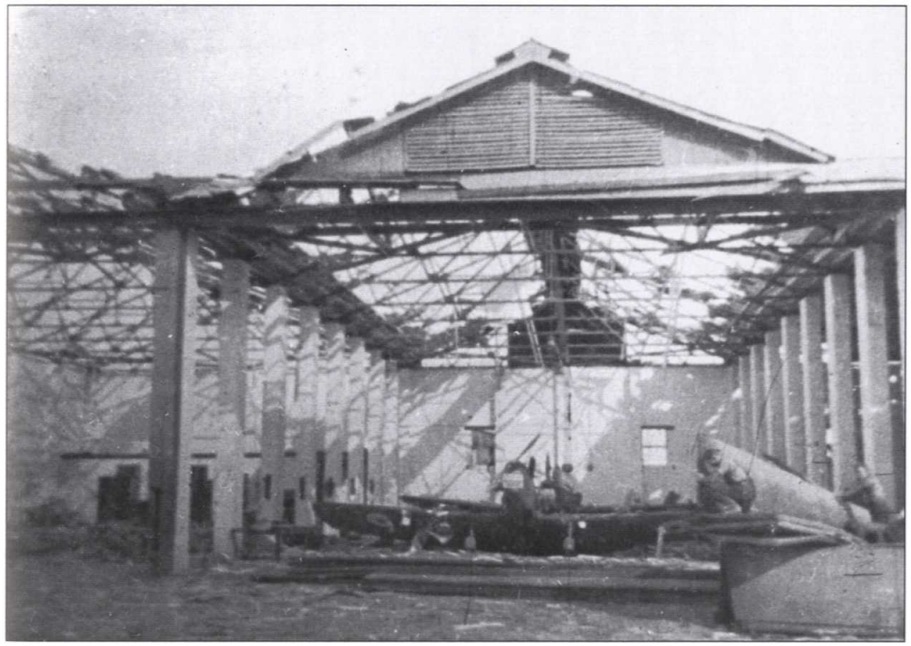
The Messerschmitt Bf 110 was the most effective twin-engined fighter type to see action during the early part of the war. This example belonged to Zerstörergeschwader 1. With a normal radius of action of 340 miles, it promised to be useful as an escort fighter. However, during the Battle of Britain the units suffered heavy losses when they were forced into dogfights with the more manoeuvrable RAF fighters.

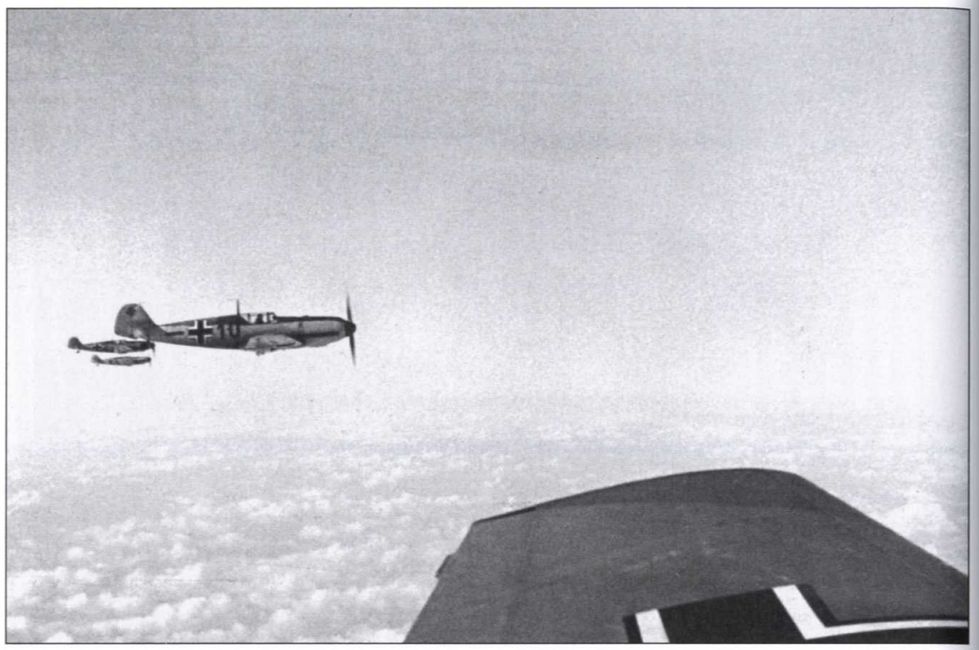


Bf 110D fitted with the fixed bulged extra fuel tank under the fuselage. This variant served with Ist Gruppe of Zerstörergeschwader 76 (I./ZG 76) operating from Aalborg in Denmark during the battle. The unprotected extra tank posed a serious fire hazard and following the disastrous action on 15 August, when the unit lost one-third of the Bf 110Ds sent into action, this variant saw little further service. via Schliephake

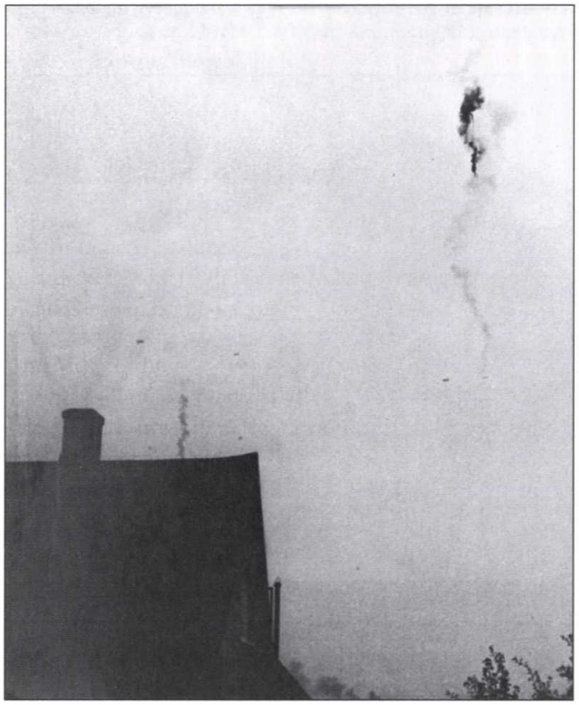
Smoke rising over Dover harbour, following the destructive dive-bombing attack on the port by Ju 87s on the morning of 29 July.

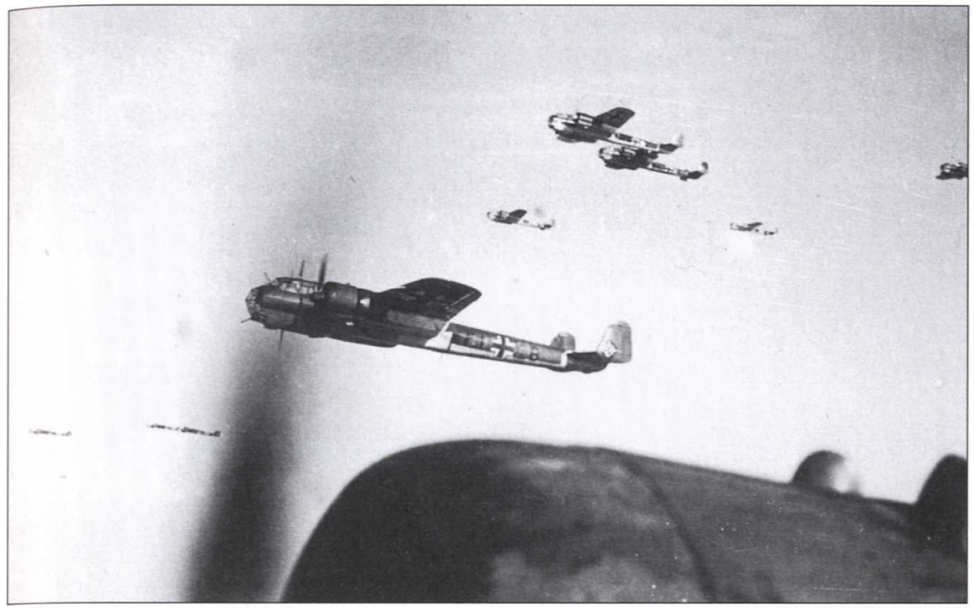
Bomb damage at Manston. This was the only Fighter Command airfield to be put out of action for any length of time during the Battle of Britain, but it was not one of the all-important Sector stations. The wrecked aircraft in the foreground was a Magister trainer.





'Schwarm' battle formation of Bf 109Es of II./JG 27, with the aircraft almost in line, abreast and flying well spaced out, early in the Battle of Britain. Neumann

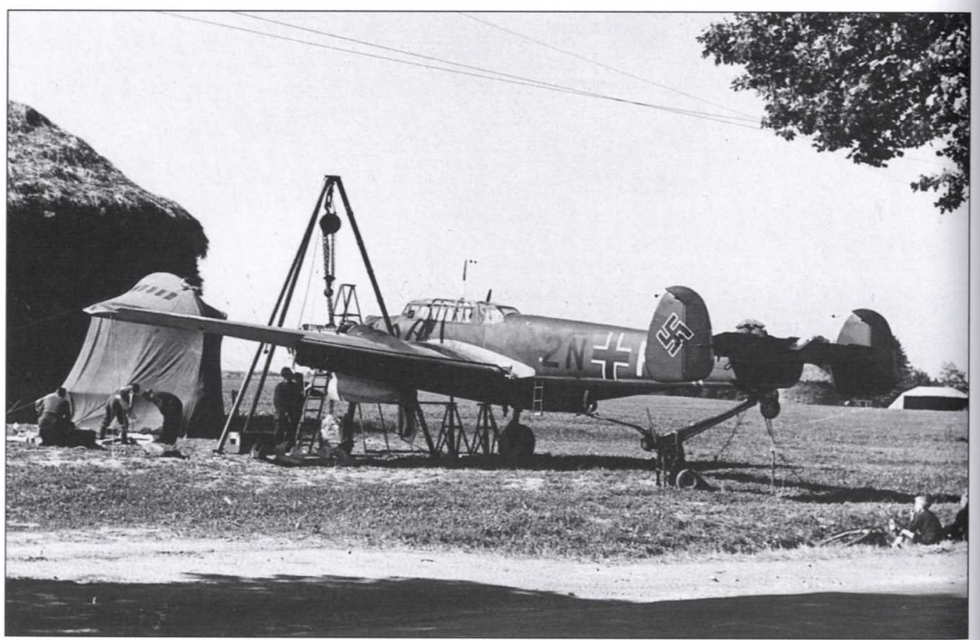




Do 17s of I./KG 76 climbing for an attack on a target in Great Britain.

Ten Hurricanes are seen climbing into position to engage the German formation over Kent on the afternoon of 16 August. They are viewed from a Do 17 of KG 76. The fighters almost certainly belonged to No. 111 Squadron, which delivered a head-on attack on the German formation shortly afterwards. A Hurricane collided with one of the Dorniers and both aircraft crashed near Marden. There were no survivors from either machine. Unger

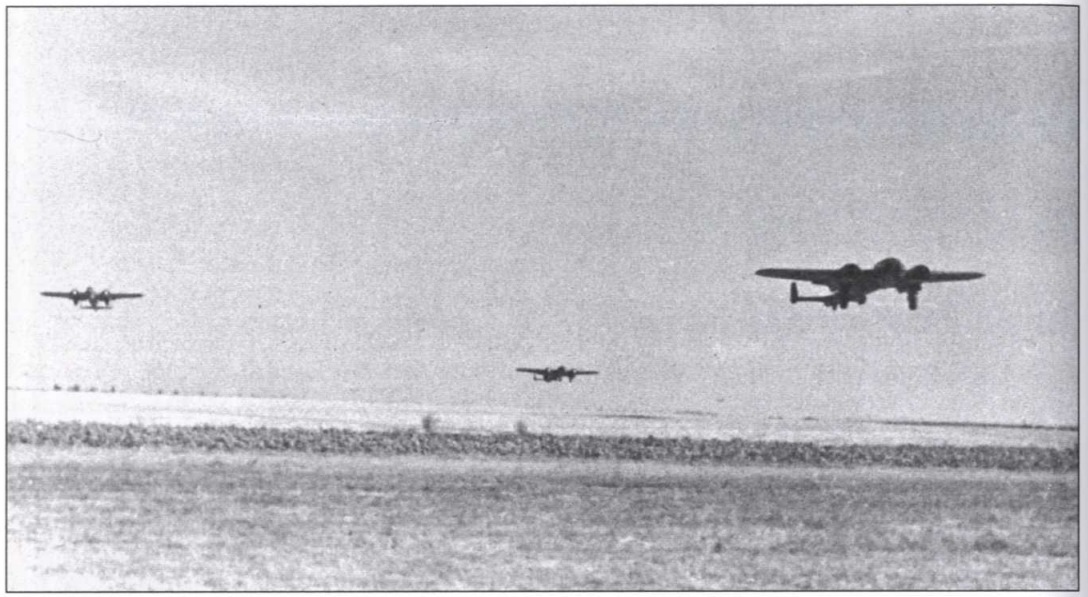
During the Battle of Britain most Luftwaffe fighter units operated from hastily prepared landing grounds in northern France. Although these had no permanent facilities, in the warm summer weather engineering work could be carried out in the open with little difficulty. A Bf 109E of III./JG 26 has an engine change at Caffiers, near Calais (above). A Bf 110C of I./ZG 76 has an engine change at Laval, near Le Mans (below).



A close-up of the marking carried by the Dorniers of 2. Staffel of KG 76 during the attacks on Great Britain in the summer of 1940. Rehm

Hauptmann Karl Ebbinghausen, commander of II./JG 2, pictured in his personal Bf 109. He was killed in action with British fighters on 16 August.

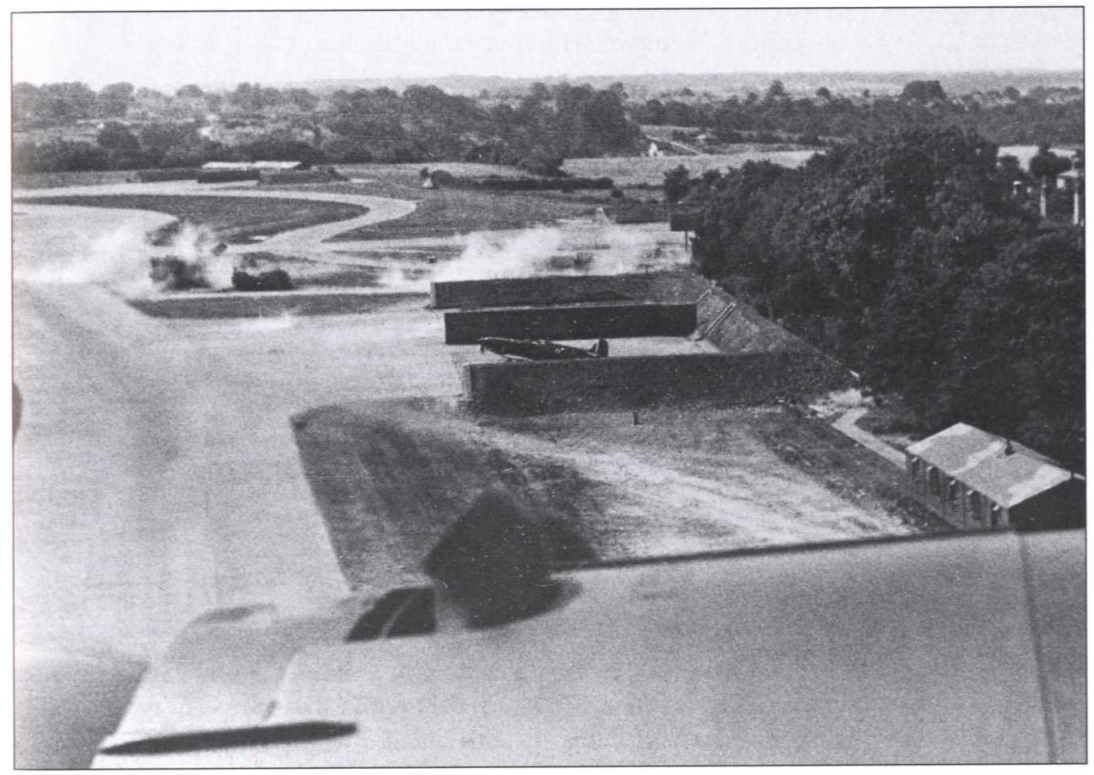
On 18 August, Kampfgeschwader 76 attempted an ambitious attack against Kenley airfield. First, a dozen Junkers Ju 88s of the IInd Gruppe were to dive-bomb the hangars and installations. Then twenty-seven Do 17s of the Ist and IIIrd Gruppen were to crater the airfield and knock out the ground defences. Finally, nine Do 17s of the 9th Staffel were to deliver a low altitude attack to finish off any important buildings still standing. Banks of thick cloud over France delayed the form-up of the high-flying Ju 88s and Do 17s, however. As a result the 9th Staffel attacked first, and suffered the wrath of the defences. Of the nine bombers, four were shot down, two more crash landed in France and the rest returned with battle damage.



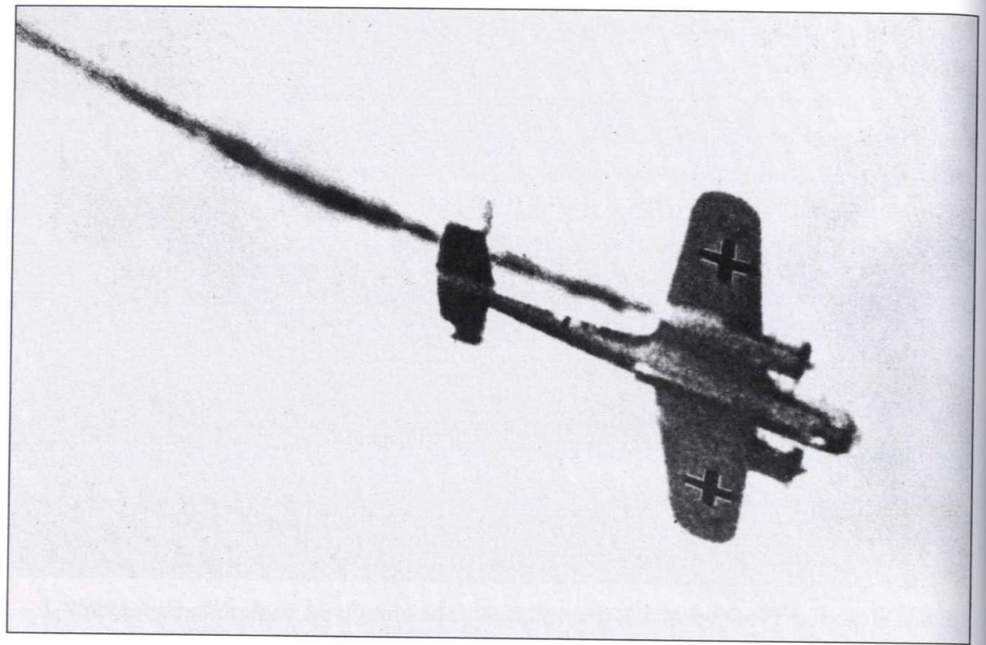
Do 17s of KG 76 taking off from Cormeilles-en-Vexin near Paris for the attack on Kenley.

Aircraft of 9th Staffel seen skirting round Beachy Head at low altitude, before crossing the coast.

9th Staffel Dornier flying below 100 feet over Kent. The town in the background is Seaford.



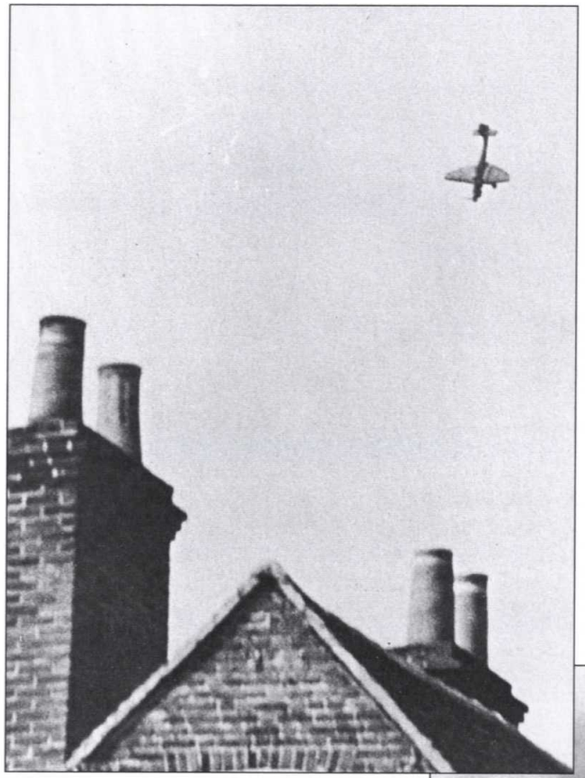
The northern edge of Kenley airfield, pictured during the attack by the 9th Staffel. Cannon shells fired from one of the bombers are seen exploding around a gun position in the background. The Spitfire in the revetment, from No. 64 Squadron, suffered minor damage.



Do 17 of I./KG 76 shot down by Pilot Officer Alan Eckford of No. 32 Squadron during the high-altitude attack on Kenley airfield, 18 August. The bomber crashed near Oxted in Surrey.

During the Battle of Britain the Luftwaffe mounted an intensive 3½-week campaign against Fighter Command airfields in southern Britain. On each day that the weather allowed, two or more airfields came under attack. Yet, despite the large effort, the attacks failed to prevent effective operations from any Sector station for more than a few hours. Moreover, during this entire campaign, front-line RAF single-engined fighter units lost fewer than twenty aircraft destroyed on the ground. In a rare success, during the combined high- and low-altitude attack on Kenley on 18 August, four Hurricanes of No. 615 Squadron were destroyed (one is seen here) and three damaged on the ground.

Wrecked hangars at Kenley, pictured immediately after the destructive attack on 18 August. Despite this damage the airfield was back in limited use within two hours of the raid. By the following morning the station's two fighter squadrons were once again at full operational capability.



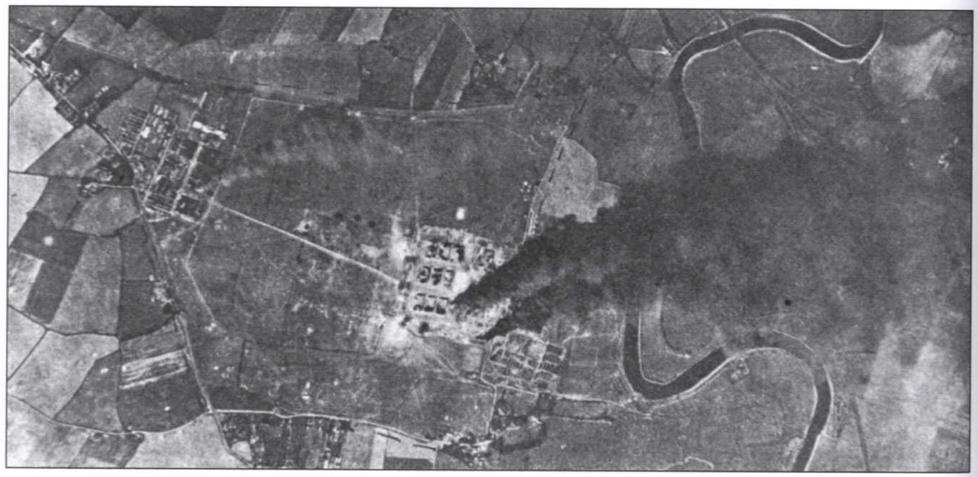
On the afternoon of 18 August four Gruppen with 109 Ju 87 dive bombers attacked Gosport, Ford and Thorney Island airfield and Poling radar station. Five RAF squadrons engaged the force, shooting down sixteen of the Stukas and causing damage to a further six.

I./StG 77, attacking Thorney Island, bore the brunt of the losses. Of the twenty-eight aircraft it sent into action, ten were destroyed and six damaged. This Ju 87 belonging to the unit crashed at West Broyle near Chichester.

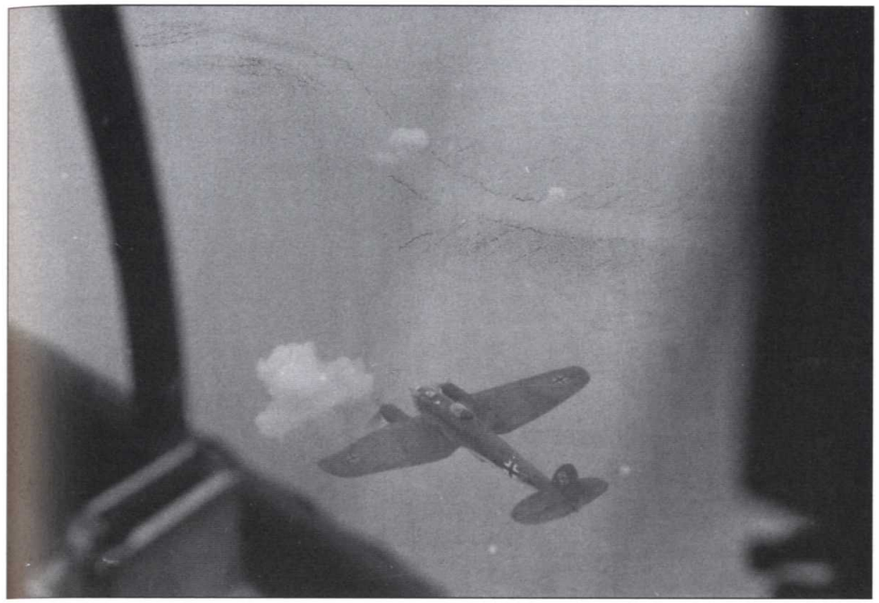
This Ju 87 from II./StG 77 made a forced landing at Ham Manor Golf Course, near Angmering. That evening the Home Guard men left the crash site, and by next morning souvenir hunters had stripped the aircraft bare.

Lucky to be alive! Unteroffizier Karl Meier, a radio operator with I./StG 77. During the attack on Thorney Island his aircraft was attacked by British fighters. He suffered eight hits on his body from British machine-gun rounds, but escaped with only flesh wounds. Selhorn

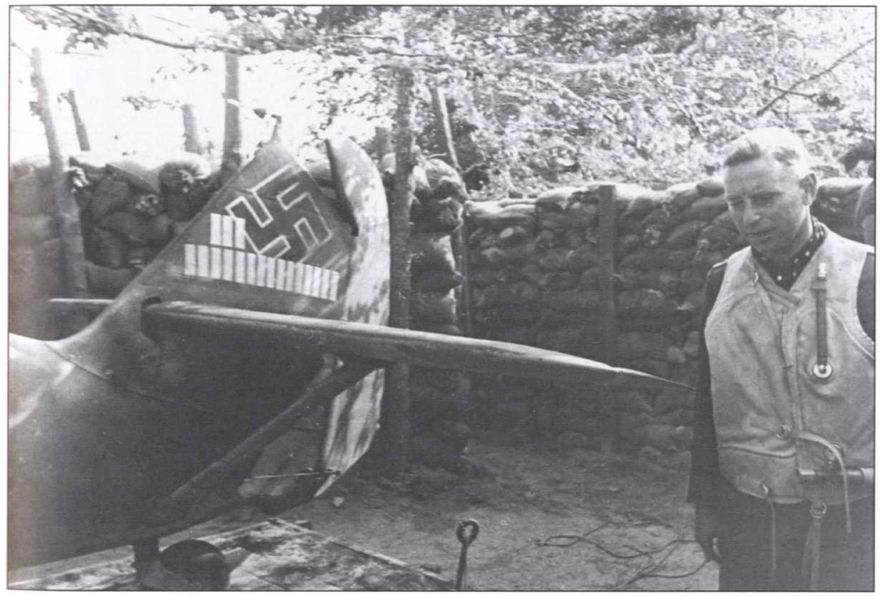
Royal Navy personnel emerging from their shelters at the Fleet Air Arm airfield at Ford in Sussex to fight the fires caused by the dive-bombing attack. Thirteen aircraft were destroyed and twenty-six damaged on the ground, but most were outdated torpedo bombers used for training and were of no relevance to the main battle.



A German reconnaissance photograph showing smoke rising after the attack on Ford.

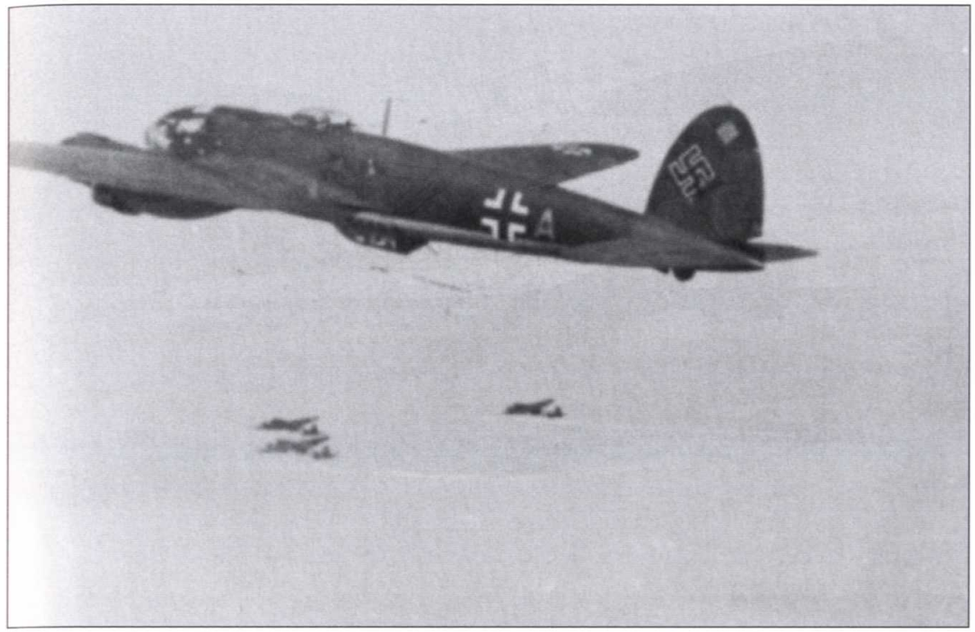


An anti-aircraft shell bursting below a Heinkel 111 of KG 53 as it headed for North Weald airfield during the late afternoon of 18 August 1940.



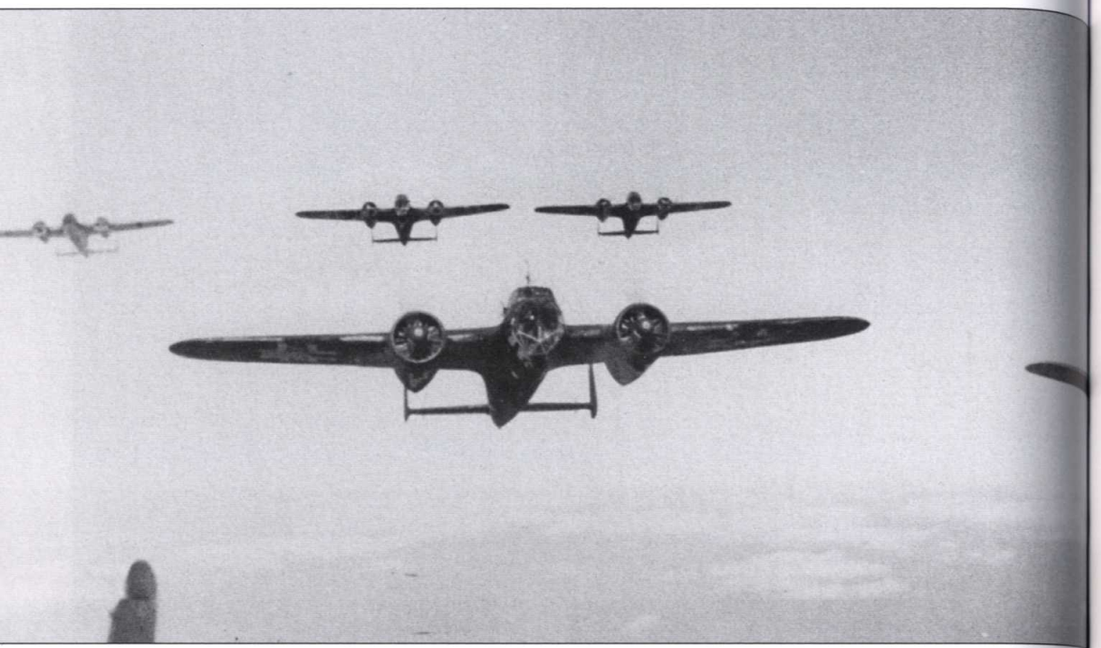
Hauptmann Horst Tietzen, the commander of 5./JG 51, with his personal Bf 109E bearing eighteen victory bars on the tail. On the afternoon of 18 August 1940, when his victory score stood at twenty, he was shot down and killed during an action with Hurricanes of No. 501 Squadron. via Ring

A He 111 releases a string of 110-pound high-explosive bombs. These small weapons were suspended in the bomb bay nose-up, and after release they tumbled into the nose-down position.



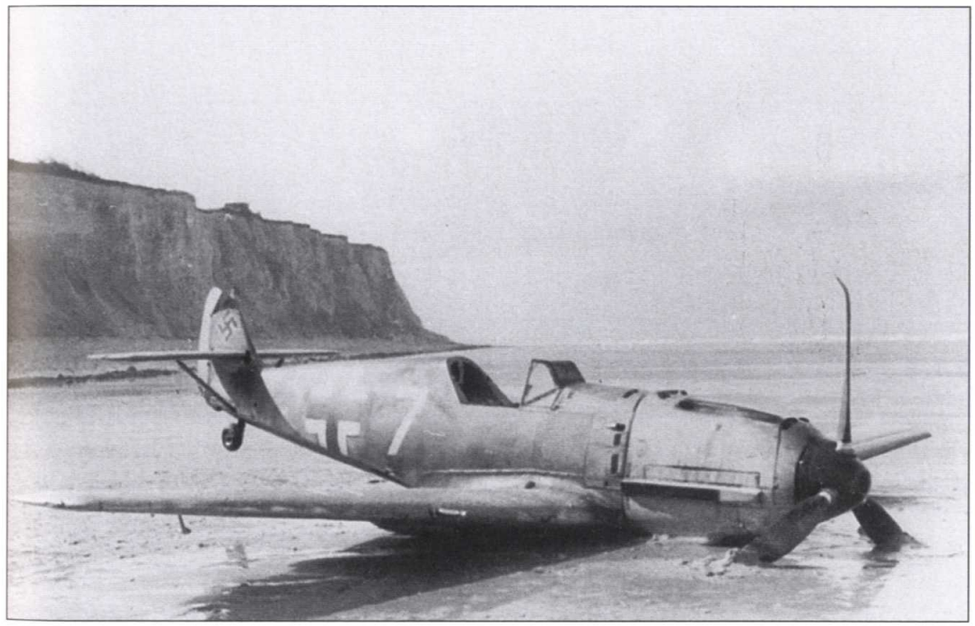
He 111s of KG 1 during the Battle of Britain.

Smoke rising at Camber, near Lydd in Kent on the afternoon of 11 September 1940. In the background the wrecks of two Heinkel He 111 bombers, one from KG 1 and the other from KG 26, burn themselves out after being shot down during an attack on London.



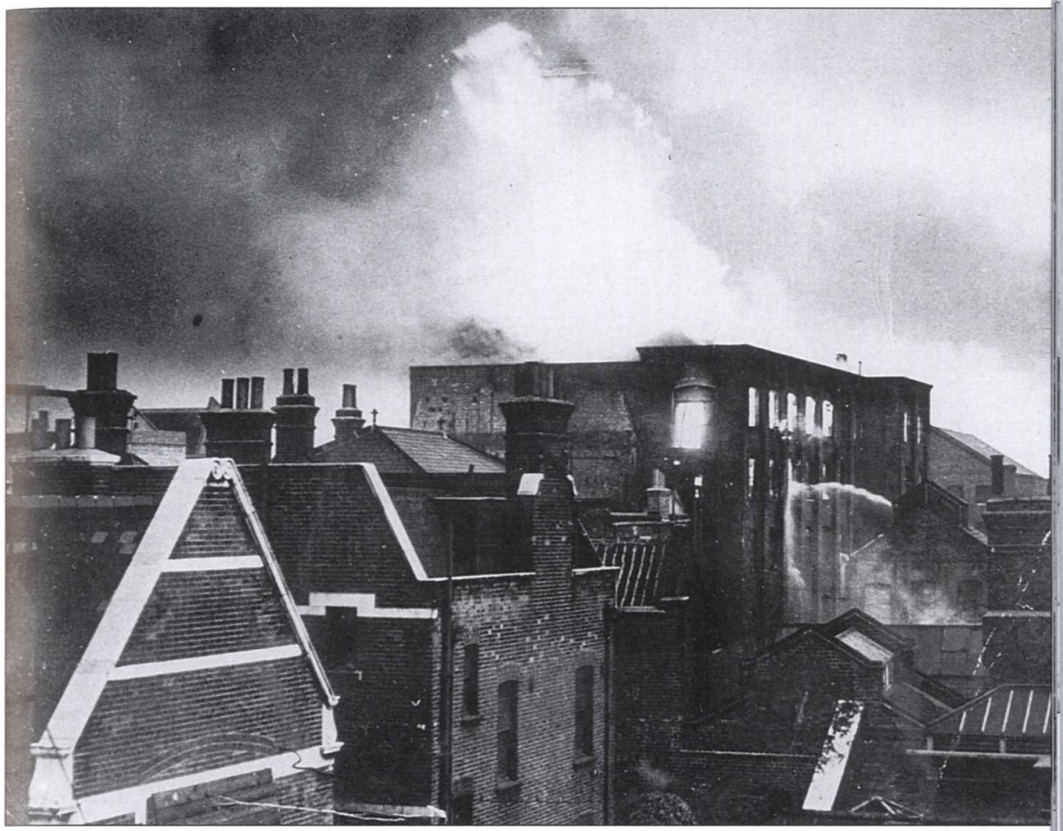
Dornier Do 17s in battle formation. This formation was designed to be easy to fly, while providing crews with the greatest possible concentration of defensive fire-power in the all-important rear sector.

A He 111 of KG 1 being inspected after it made a crash landing in southern Britain.



During the daylight attacks on London the escorting Bf 109s had to operate at the limit of their radius of action. Several of these fighters were lost when they ran out of fuel, and this one only just made it back to the coast of France. via Willis

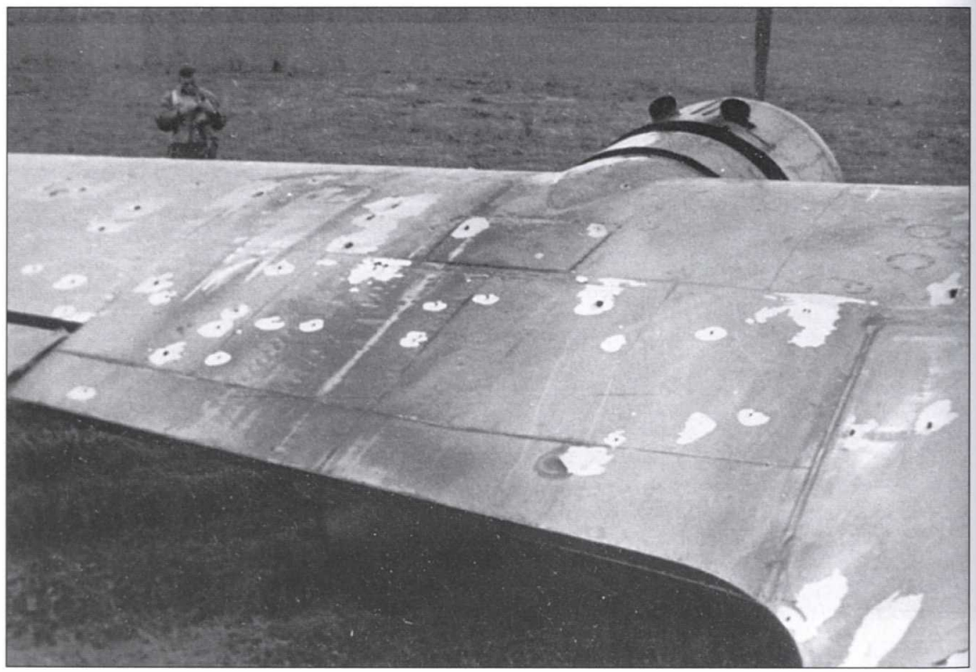
He 111 of KG 1 over West India Docks, during the heavy attack on that part of London on the afternoon of 7 September 1940.



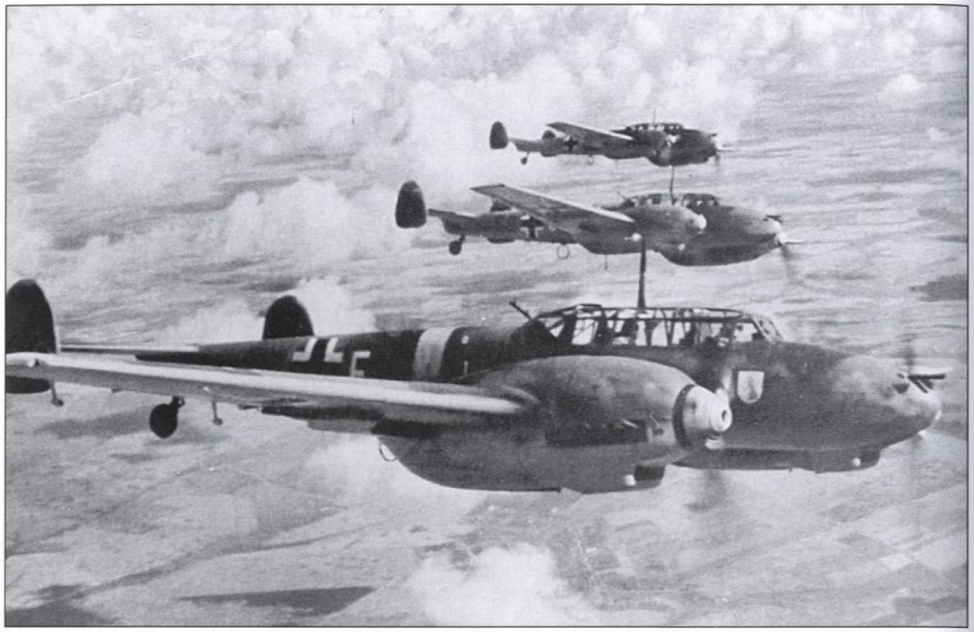
The huge fires started among warehouses at the Surrey Docks on 7 September served as a beacon for the follow-up attack that night. The fires were still burning the following morning, and it required 130 fire pumps to bring the conflagration under control.

From the roof of a building in Fleet Street, smoke is seen rising from the many fires resulting from the bombing of the dockland area of London, 7 September 1940.

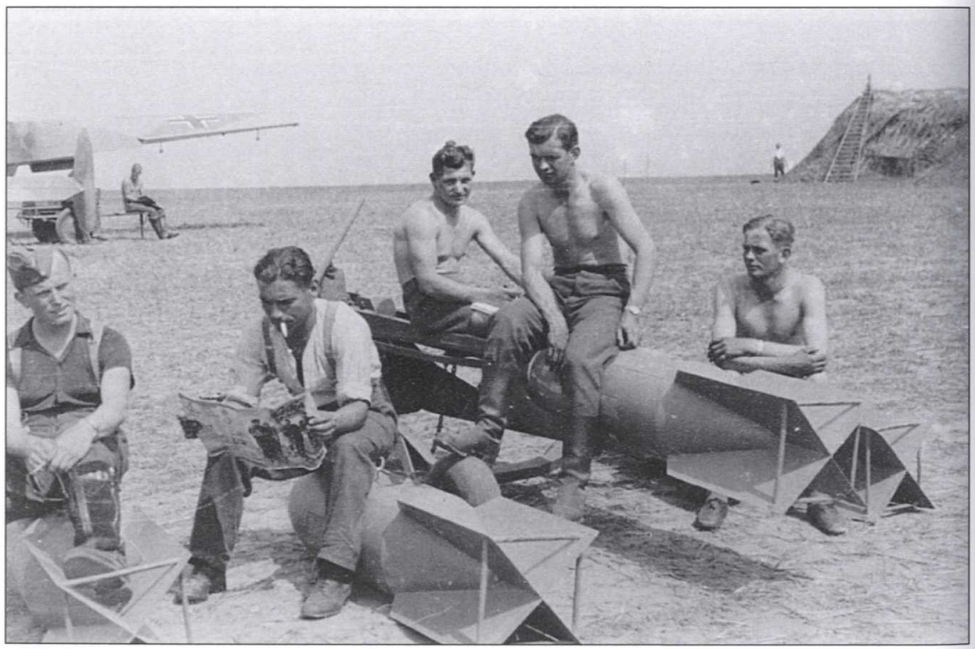
These images illustrate the weakness of the .303-in machine-guns fitted to British fighters, when used against enemy bombers. On 15 September this Do 17 of KG 76 crash-landed in France with more than 200 hits. That number of hits indicates that at least two British fighters fired most of their ammunition into the bomber from short range. On the original print of the close-up photograph more than fifty bullet strikes are visible. via Rehm



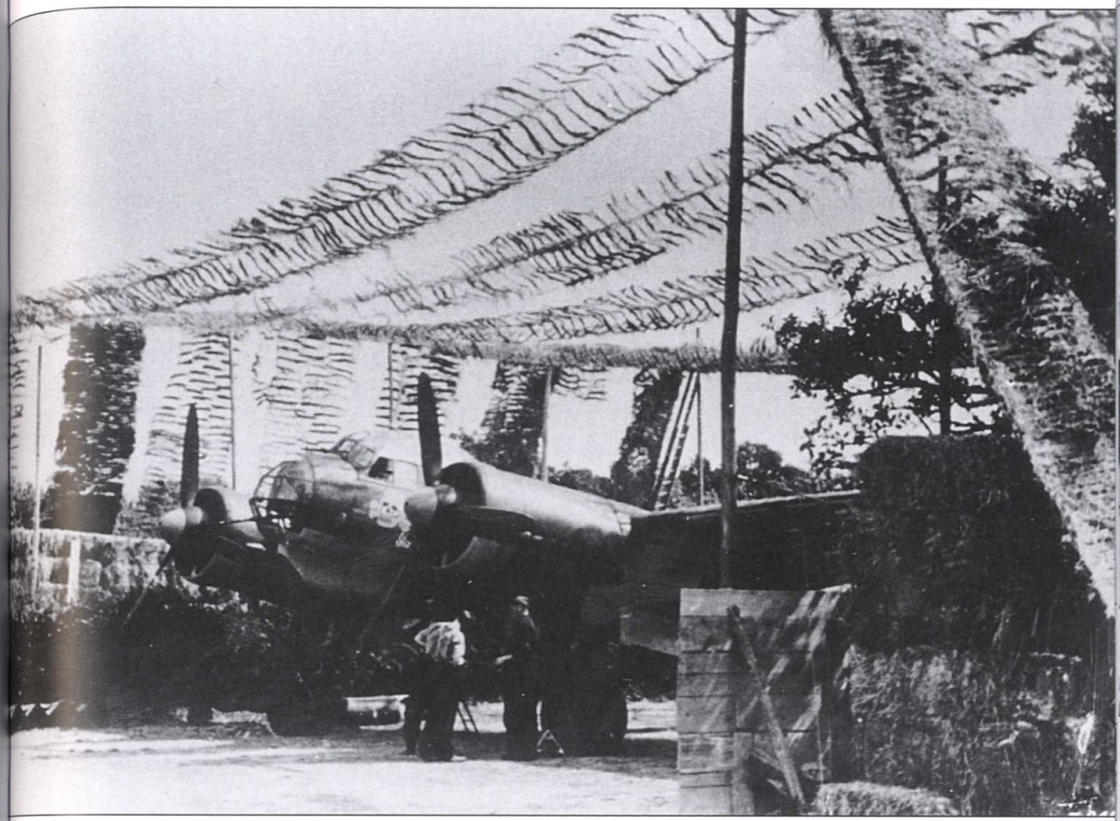
This badly damaged Do 17 from II./KG 3 made it back to Belgium on one engine after the action on 15 September, but was wrecked in the ensuing crash landing. Schultz



Bf 110s of Schnellkampfgeschwader 210 (SKG 210). This fighter-bomber unit had been formed to introduce the new Messerschmitt Me 210 into service when it became available. However, during the Battle of Britain it operated the earlier type.



Ground crewmen of SKG 210 await the order to load 550-pound bombs on the unit's Bf 110s.

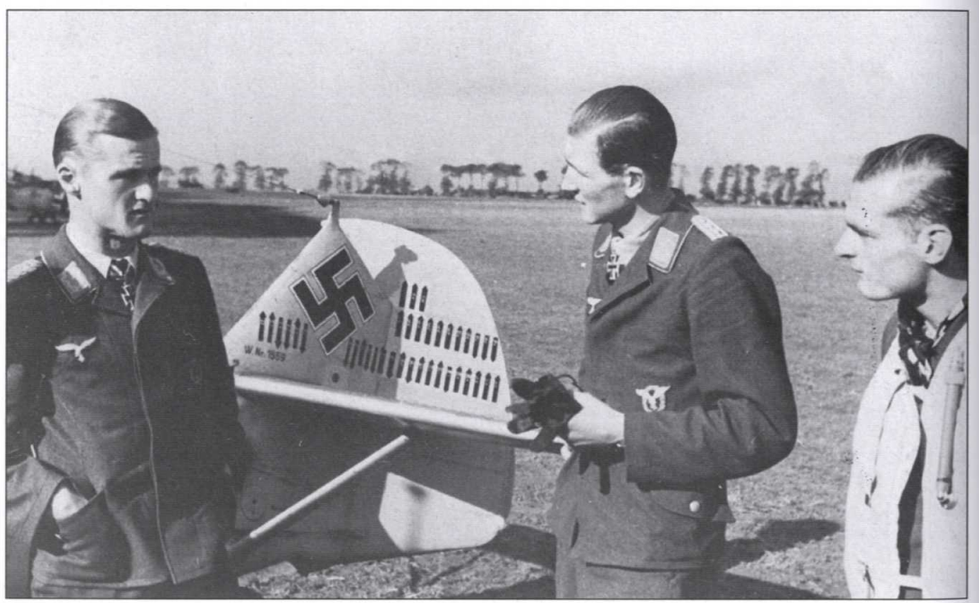


Junkers Ju 88 of KG 54, in its camouflaged pen at St André in France. via Michulec

Bf 109Es of II./JG 53 preparing to take off from the grass airfield at Dinan in western France.

Bf 109Es loaded with 550-pound bombs. During the final phase of the Battle of Britain these aircraft delivered numerous attacks on London and other targets in southern Britain.

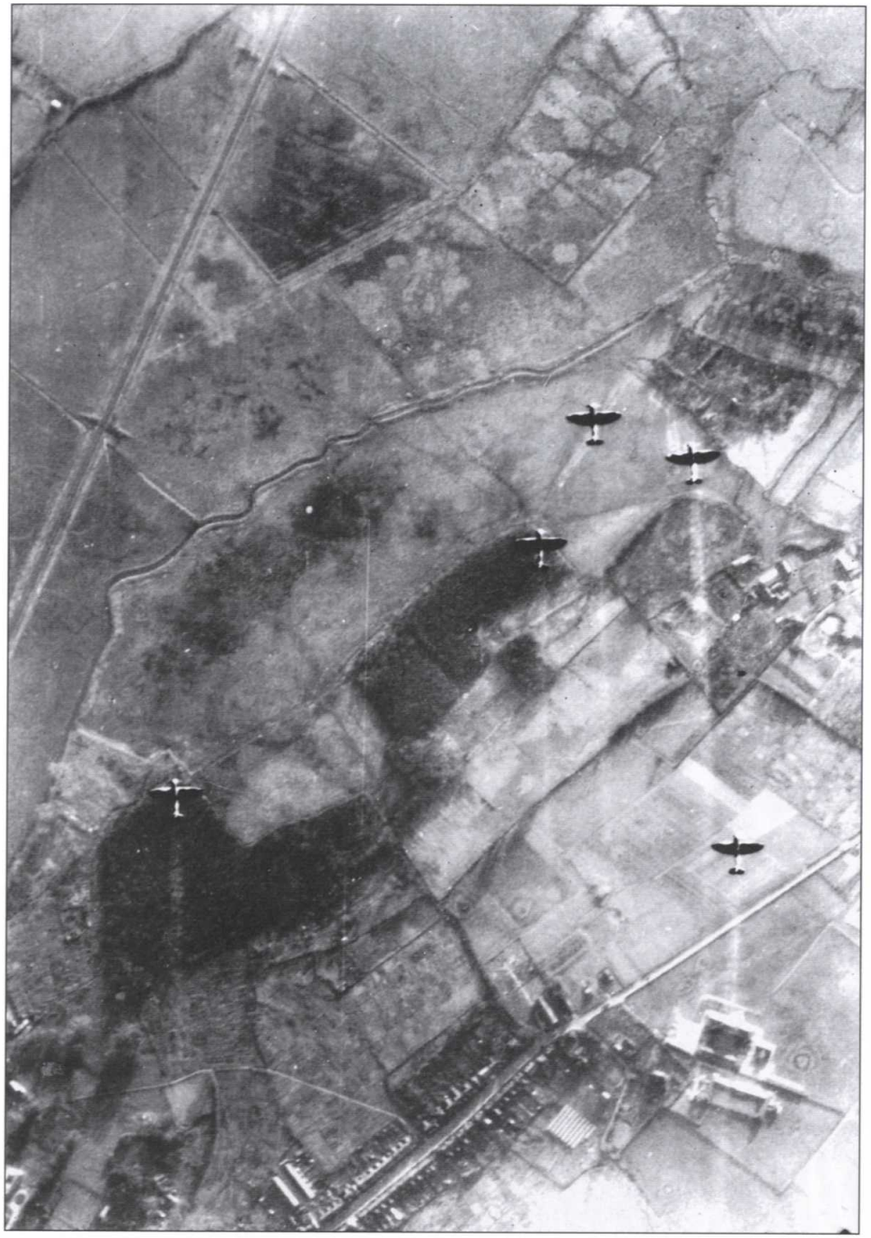
Oberst Werner Mölders, commander of JG 51, was the top-scoring German fighter ace in the Battle of Britain. His victory total passed the fifty mark in October 1940, and reached sixty in the following February.



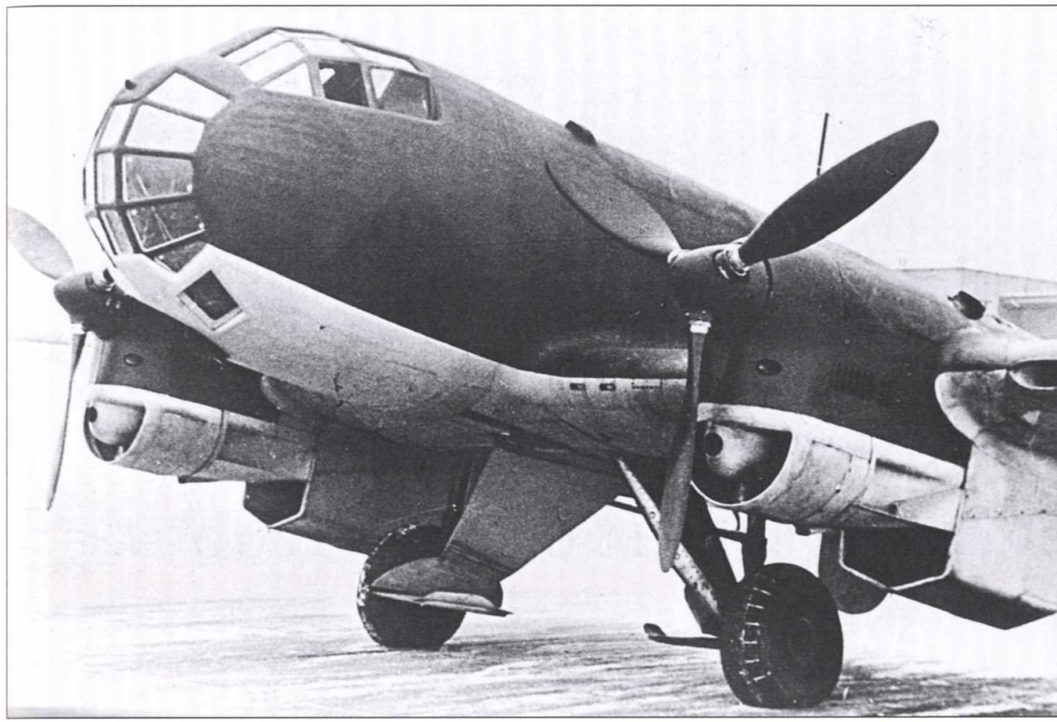
Major Günter Lützow, left, commander of JG 3 during the latter part of the Battle of Britain. On 18 September 1940 his victory score stood at fifteen. To his right is Hauptmann Wilhelm Balthasar, commander of IIIrd Gruppe, whose victory score topped the forty mark when he was wounded in action on 4 September 1940.

Major Helmut Wick, facing camera, had a meteoric rise during the Battle of Britain. In July 1940, as an Oberleutnant, he commanded 3. Staffel of JG 2. In September, as a Hauptmann, he took command of Ist Gruppe. In October, with the rank of Major, he assumed command of the Geschwader. Helmut Wick was killed on 28 November in a dogfight with Spitfires of No. 609 Squadron, when his victory score stood at fifty-six. via Frappe

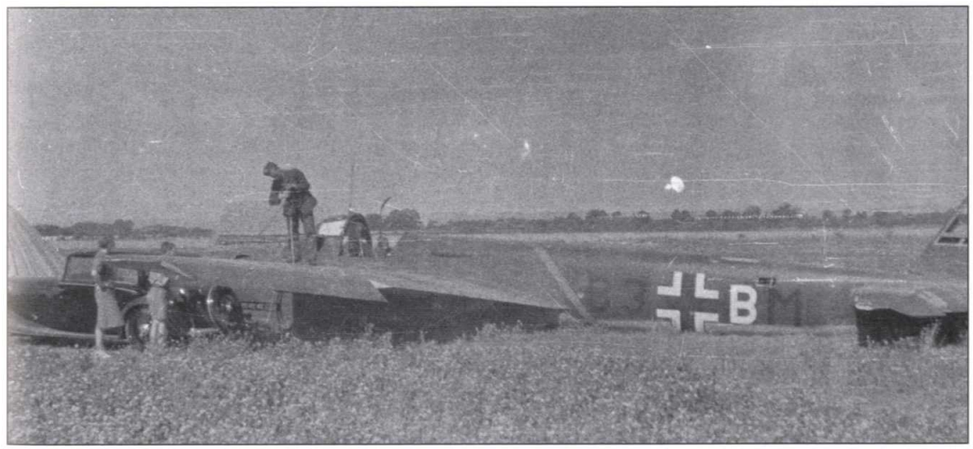
Major Adolf Galland, commander of JG 26 during the latter part of the Battle of Britain, seated in his personal Bf 109. Note the non-standard telescopic sight mounted in the windscreen. Galland's victory score reached forty on 25 September 1940.



An unusual shot of Spitfires over Snodland, Kent, taken from the Messerschmitt Bf 110 reconnaissance aircraft the Spitfires were climbing to intercept, 21 December 1940. Twenty-three Spitfires from Nos 64 and 611 Squadrons took part in the interception which ended in a long chase out to sea. After suffering severe damage and with a dead gunner, the Messerschmitt escaped and made an emergency landing at Mardyk near Dunkirk. via Fischer



Junkers Ju 86P high-altitude reconnaissance aircraft. This advanced aircraft featured a pressurized cabin and was powered by two highly supercharged diesel engines, enabling it to operate at altitudes above 37,000 feet, where it was immune from fighter interception during the early war years.



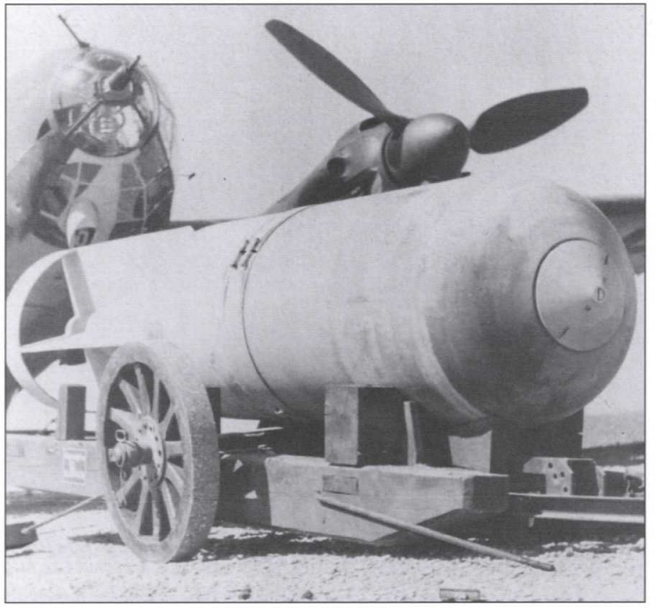
Spoils of war. Royal Air Force personnel pumping petrol from a Ju 88 of KG 54 that crash-landed near Tangmere into a private car belonging to one of them. Such misuse of captured enemy material was illegal, but usually those in authority turned a blind eye to it. Lloyd

The Night Blitz on Britain

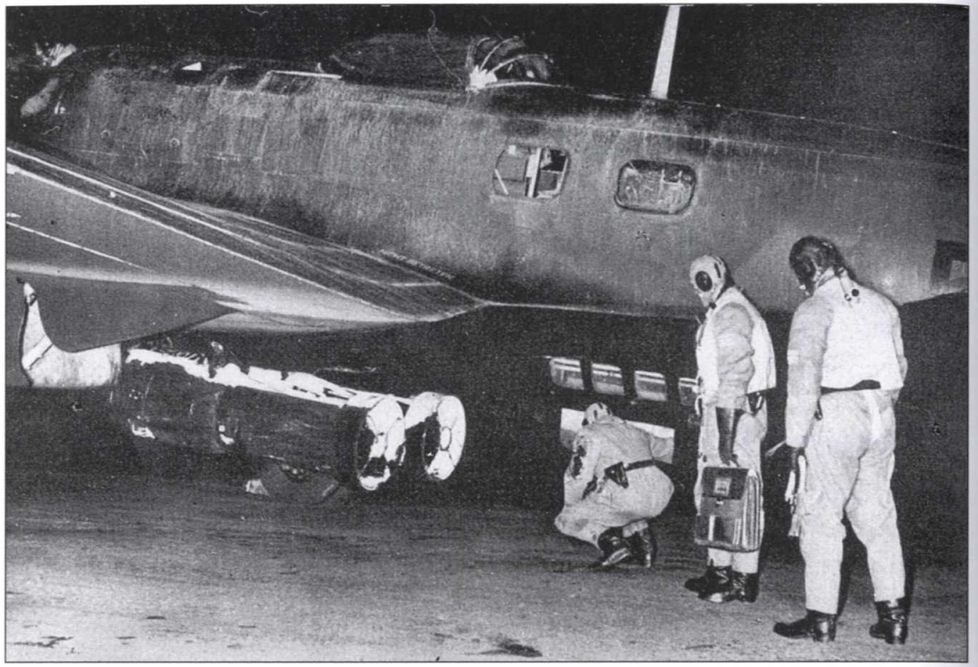
August 1940 to May 1941

'Knickebein' transmitting station situated at Mount Pinçon, near Saint Lô in northern France. The station radiated a narrow radio beam at high power, which was accurately aligned on the target to be attacked. The beam signals were picked up by the standard airfield approach receivers carried by all German bombers, and no special equipment was necessary for crews to use this system.

Armourers carry out final adjustments on a 550-pound bomb mounted under the fuselage of a He 111. Note the compressed cardboard 'screamers' fitted to the fins of the bomb, intended to increase the weapon's effect on enemy morale.

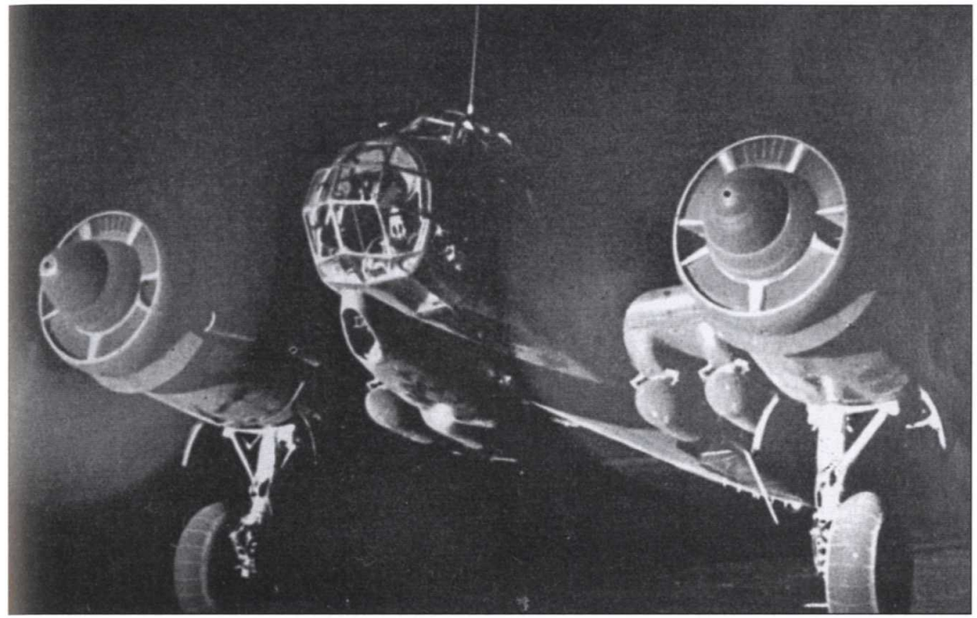


A He 111 with a 5,500-pound SC 3500 'Max', the heaviest type of bomb in normal use by the Luftwaffe.



A crew of KG 4 boarding their He 111 for an attack on Great Britain. The aircraft is loaded with two 2,200-pound bombs.

Ground crewmen of KG 1 crank the inertia starter handle to start the starboard engine of a Ju 88 of KG 1, before a night attack on Great Britain.



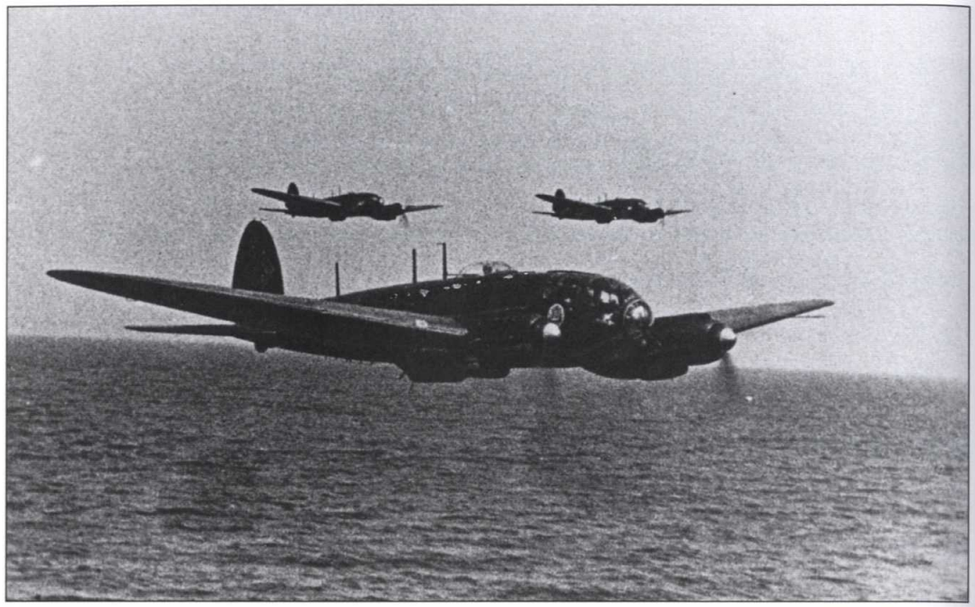
With four 550-pound bombs carried externally on the underwing racks under the inner wing, a Ju 88 taxies out for a night attack.

A He 111 with two 2,200-pound bombs under the fuselage, taking off for a night mission.

A sombre-looking Winston Churchill inspecting the gutted works of the Silvertown Rubber Company at Winchester Street, 8 September 1940.

Warehouses burning at St Katherine's Dock, following the heavy attack on the night of 11/12 September 1940.

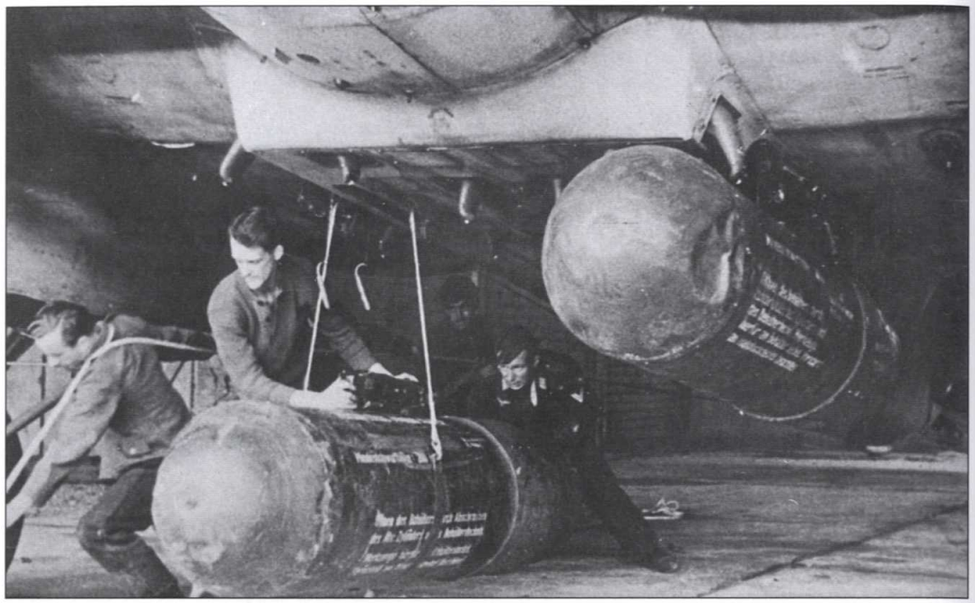
Bomb damage in Leicester Square, in front of the headquarters of the Royal Automobile Association, on the morning of 17 October 1940. The vehicles in the foreground had suffered damage that was beyond even the repair skills of that famous organization.



He 111s of Kampfgruppe 100 (KGr 100), the special night-attack unit which operated from Vannes in Brittany. These aircraft carried receivers for the X-Gerät beam bombing system, employing two additional aerial masts mounted on top of the rear fuselage. The system enjoyed only moderate success during attacks on Great Britain, however.

Feldwebel Horst Götz of KGr 100 in the cockpit of his He 111. Note the 'Viking Ship' emblem of the unit painted on the fuselage. Goëtz

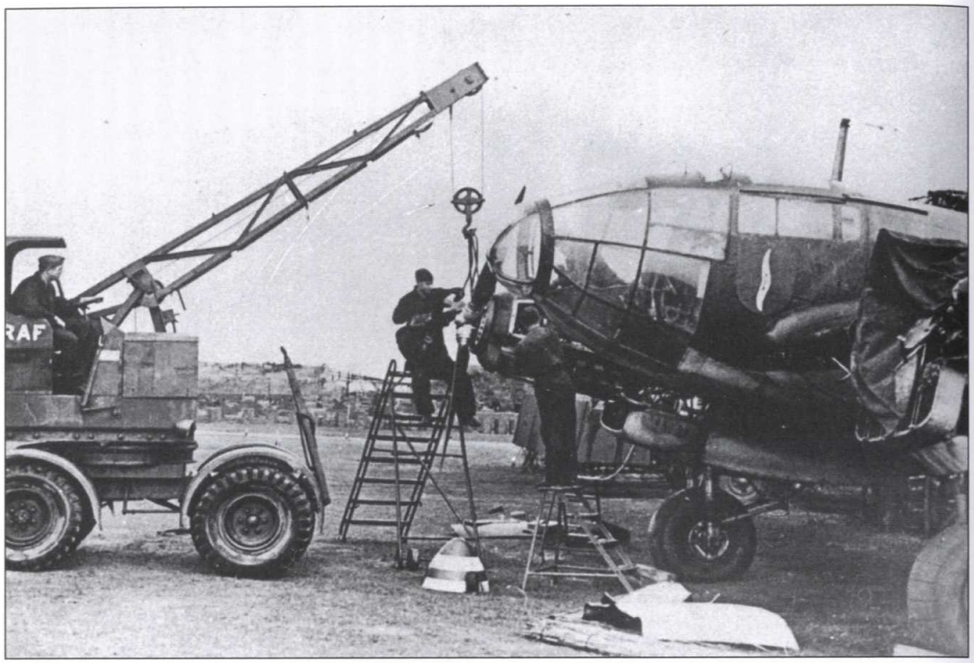
This Heinkel of KGr 100 returned to France after suffering damage during an attack on Great Britain. It made a forced-landing on the beach in Brittany, but before it could be moved the incoming tide and the Atlantic rollers made short work of it. via Trenkle



Armourers loading 2,200-pound parachute mines on the fuselage racks of a He 111. In addition to their intended role of rendering waterways hazardous for shipping, these thin-cased weapons were often fitted with impact fuses for use against land targets.

This He 111-8 from II./KG 27 was running in to deliver a low-altitude night attack on Yeovil when it struck a mist-covered hill near Lulworth Cove, 22 May 1941. The bomber carried a fender attachment mounted in front of the nose and wings to ward off barrage balloon cables. The fender weighed about 550 pounds and required a similar weight of lead in the rear fuselage to serve as a counter-balance. The additional weight and drag of the installation reduced the performance of the aircraft and impaired handling. The device was unpopular with crews, and after a short time it was removed from front-line aircraft.

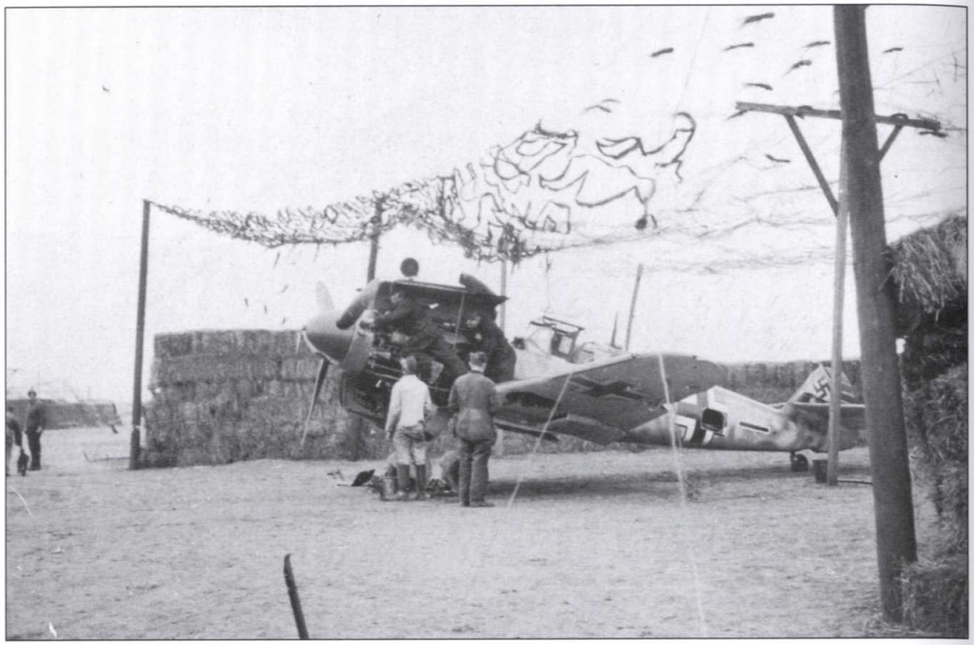
He 111 of III./KG 26, a night-attack unit that employed the Y-Gerät beam bombing system (note the additional aerial aft of the cockpit). This device proved no more successful than the X-Gerät during attacks on targets in Great Britain, however. The man in front of the aircraft (above) and in the cockpit (below) is Major Viktor von Lossberg, the Gruppe commander. von Lossberg



Propeller change on a Heinkel He 111 of KG 4 at an airfield in France. Note the use of the mobile crane captured from the RAF. via Michulec

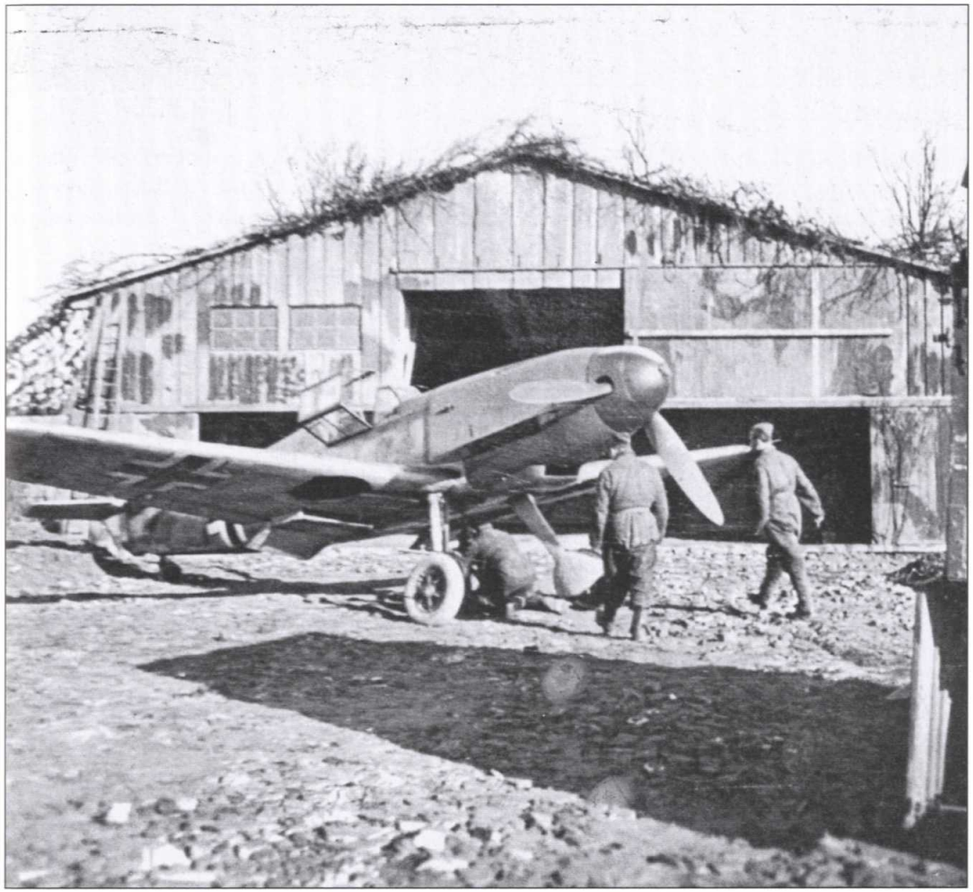
THE HOLDING CAMPAIGN IN THE WEST

1941 TO 1942



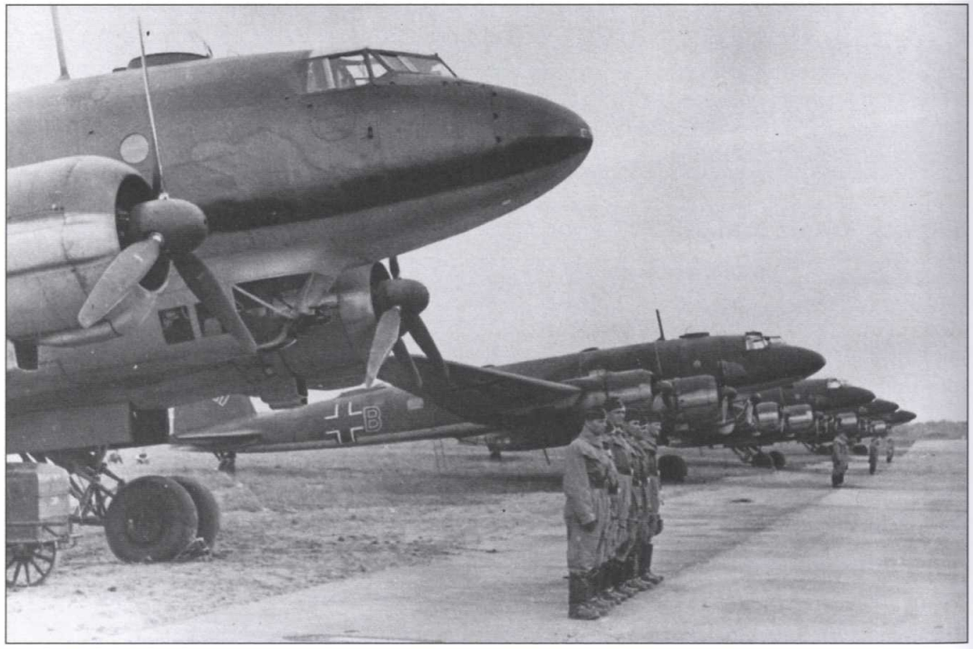
An early production Bf 109F-1 flown by Major Werner Mölders, commander of JG 51, at St Omer in northern France. The fifty-six victory bars on the rudder indicate that the photographs were probably taken in February 1941. via Schliephake

A Bf 109F flown by the commander of IIIrd Gruppe of JG 2, early in 1941. Note the unit's 'Cock's Head' insignia on the engine cowling.



Bf 109F of one of the Geschwader based in the west, either JG 2 or JG 26. In the background is its camouflaged individual hangar, painted to look like a farm building.

During 1940 and '41 Focke Wulf Fw 200 Kondor aircraft of KG 40 flew far out into the Atlantic, plying between Bordeaux in France and Stavanger in Norway. At that time the Royal Navy was desperately short of escort vessels and the aircraft were able to attack convoys with little risk to themselves. Jope



Armourers loading an 250-kg bomb on the rack under the port outer engine of an Fw 200. Jope

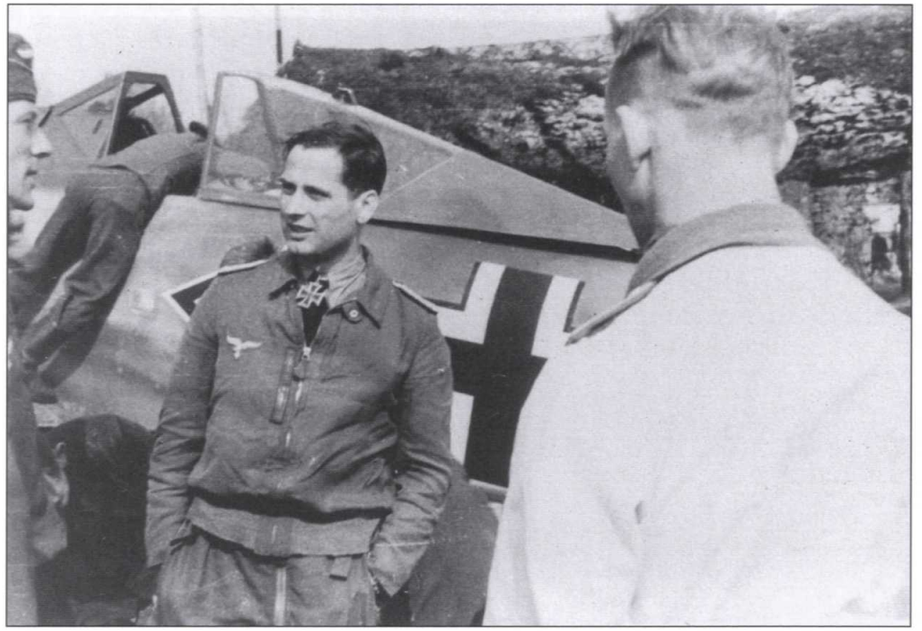
A crew of KG 40 don life-jackets before boarding their Fw 200 for an overseas mission. On the far left is Hauptmann Bernhard Jope, one of the leading exponents of this type of aircraft. Jope

Mission tally painted on the rudder of the Fw 200 flown by Leutnant Buchholz of I./KG 40, listing thirteen sorties flown over Britain and ten attacks on ships. via Schliephake

Inside an Fw 200 during an overseas mission. Note the large 66 imp gal fuel tank, one of three such tanks that could be installed in the fuselage for extended range missions. via Selinger

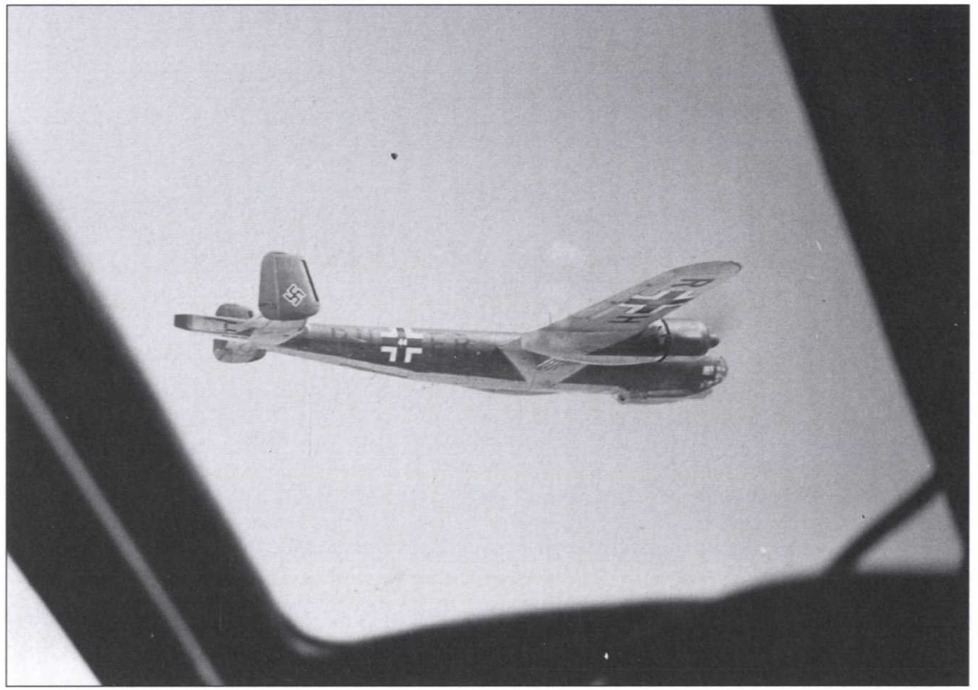
The first unit to become operational with the FW 190 was II./JG 26, based at Moorseele in Belgium, in the summer of 1941. The new German fighter immediately demonstrated a clear edge in combat capability over the Spitfire V, its RAF contemporary, enabling the small force retained in the West to contain the larger RAF attacking forces.

Initially the BMW 801 engine fitted to the Fw 190 was prone to overheat and sometimes catch fire, as happened to this aircraft. Several aircraft were lost to this cause and for a time pilots were forbidden to fly over the sea beyond gliding range from the coast.



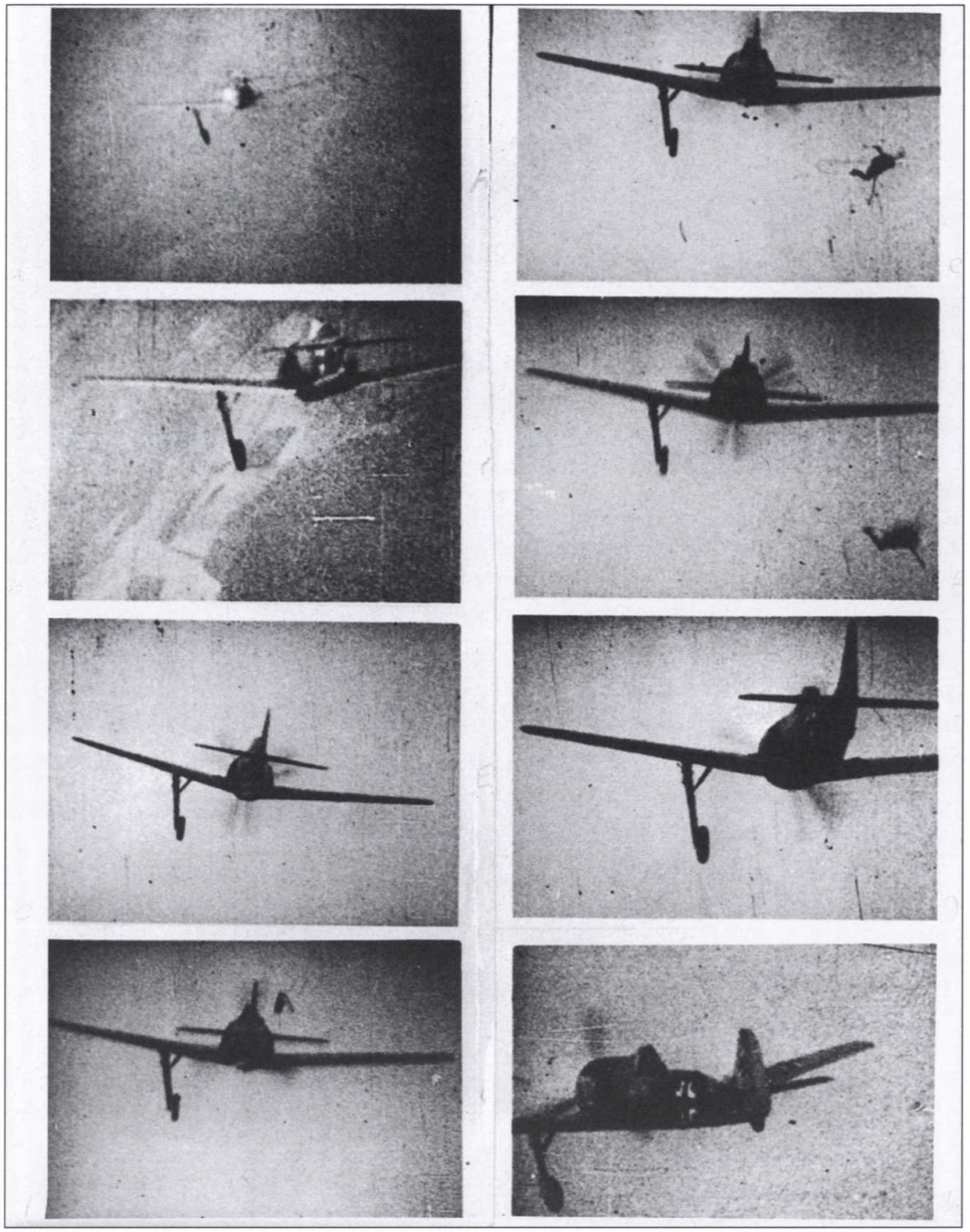
The second Gruppe to receive the Fw 190 was III./JG 26, commanded by Major Gerhard Schöpfel, which began re-equipping in September 1941.

In the summer of 1941 the Do 217 entered service in the West, flying with KG 2 and KG 40.

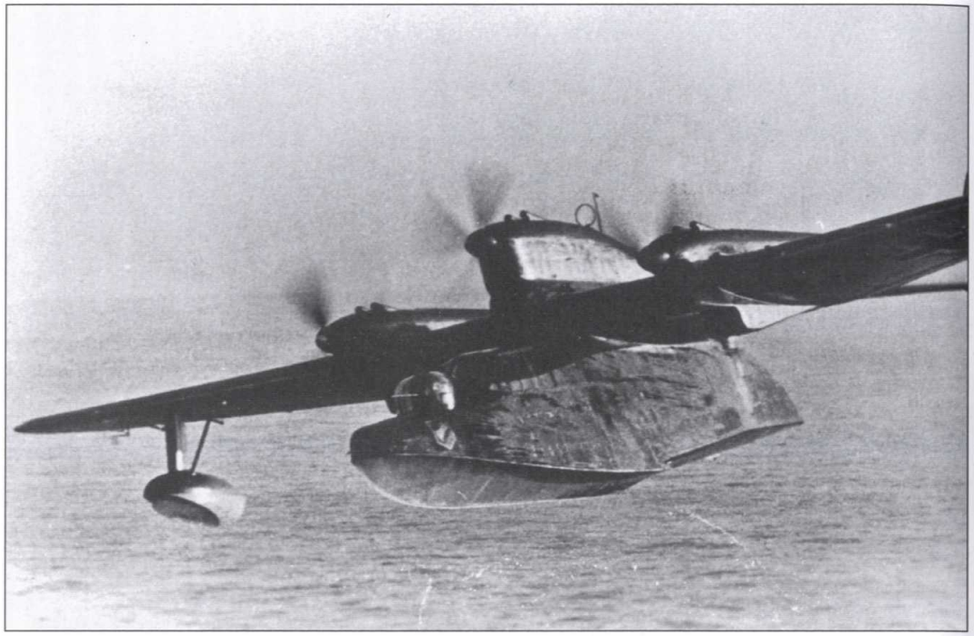


Following the success of the Junkers Ju 87 and Ju 88 in the dive-bombing role, the Luftwaffe stipulated that the Do 217 should also be able to carry out steep diving attacks. The bomber was fitted with a dive brake at the end of the fuselage, but the aircraft was too large and too heavy for this purpose. After several Do 217s had been overstressed pulling out from dives, the idea was dropped. via Schliephake

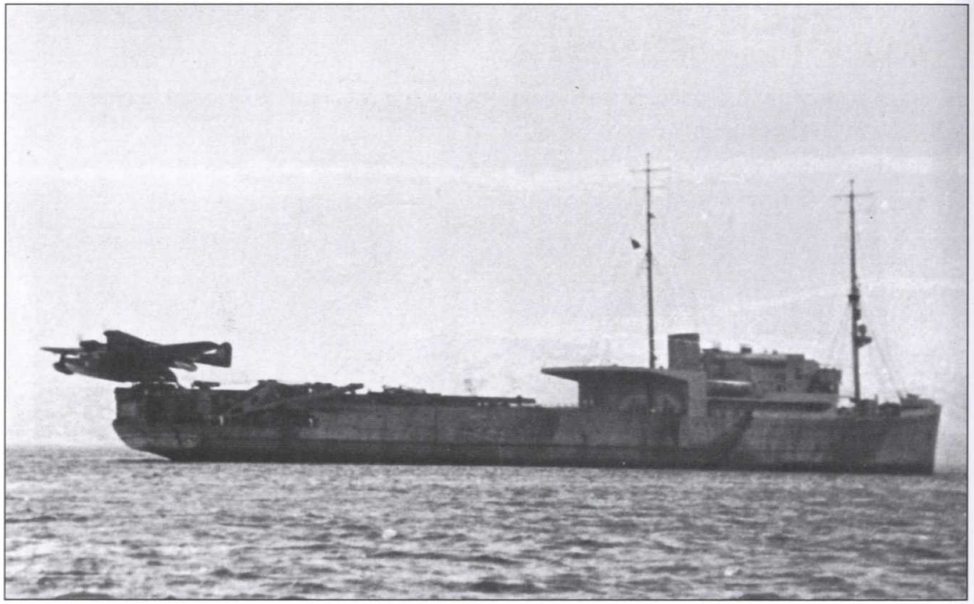
JG 2, operating in the West, was the second Geschwader to re-equip with the Fw 190. Pilots of IIIrd Gruppe are seen during a scramble take-off, probably at Morlaix in France in the late spring of 1942.



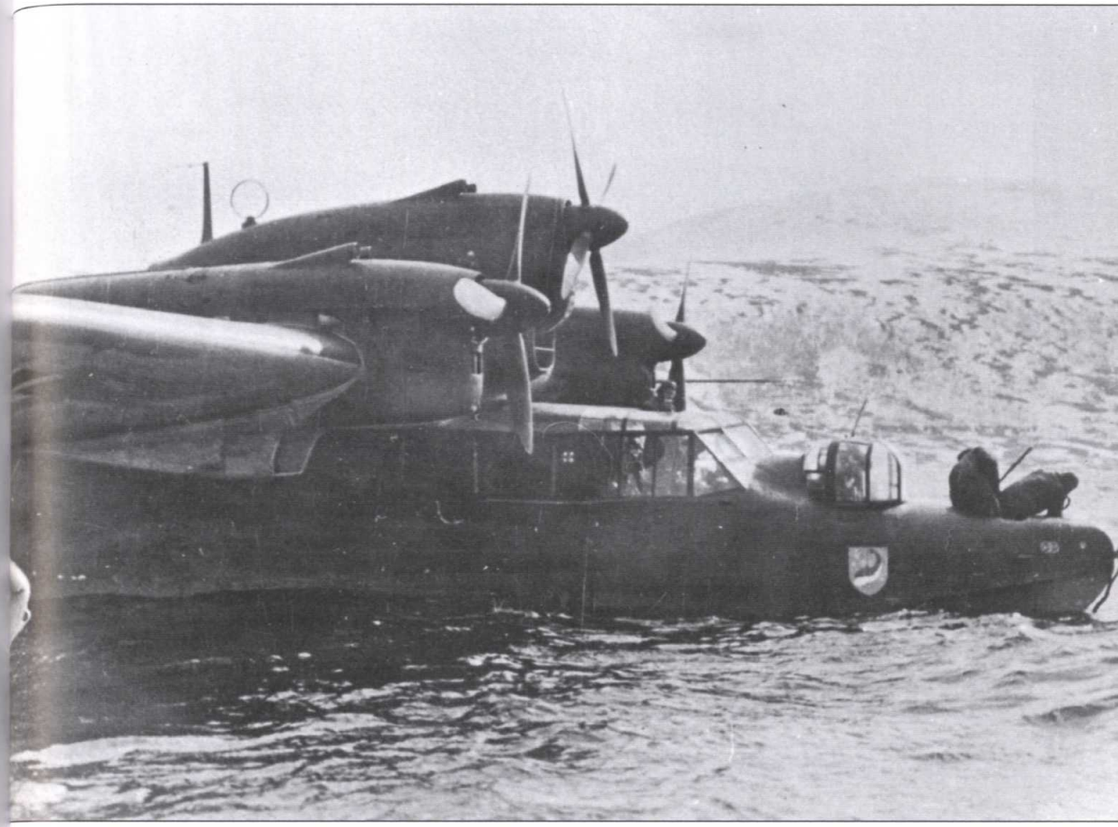
Combat photographs taken by Flt Sgt A. Robinson, a New Zealand Spitfire pilot of No. 485 Squadron, during an action on 4 May 1942 near Ambletuese in northern France. Robinson failed to see the German pilot leaving his aircraft, and he afterwards claimed the enemy fighter 'probably destroyed'.



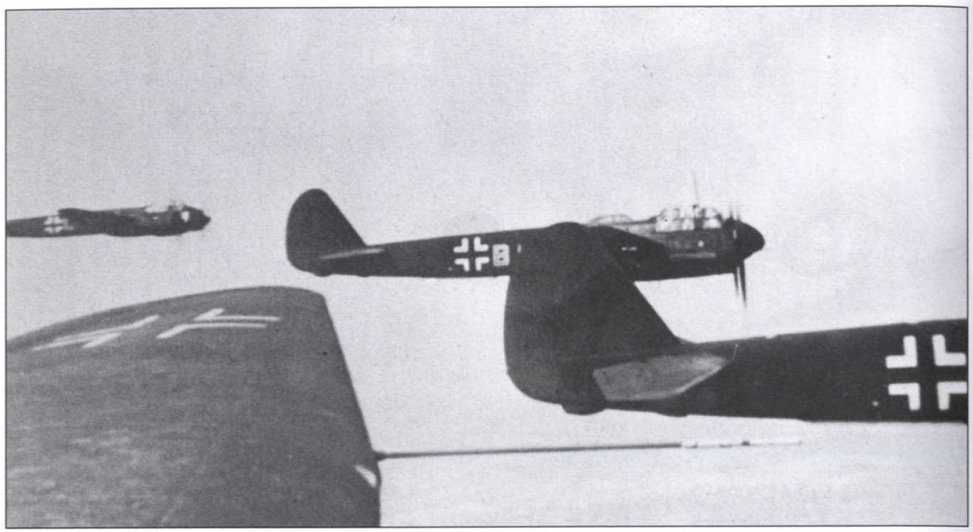
The three-engined Blohm und Voss Bv 138 flying boat was a highly effective maritime reconnaissance aircraft. via Michulec



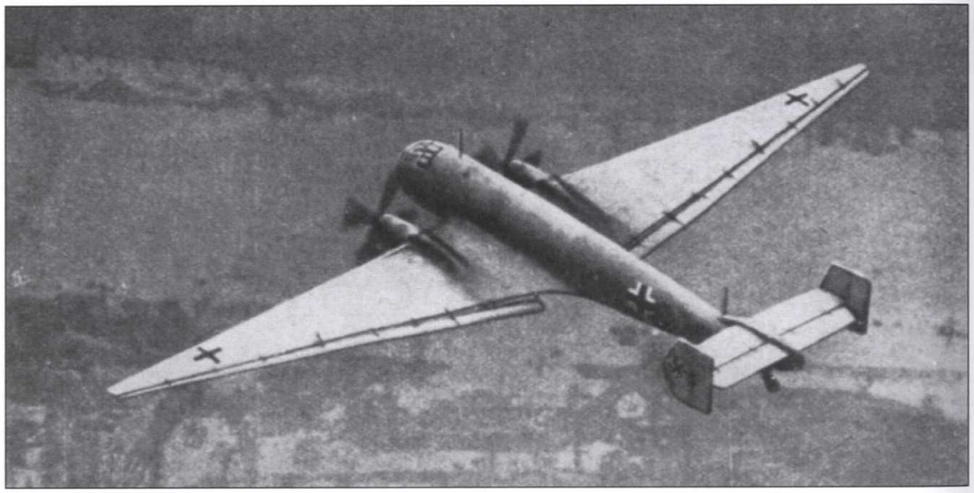
Lying at anchor in Tromso Fjord, Norway, the seaplane carrier *Friesenland* catapult-launches a Bv 138 of Kü.Fl 406. The method enabled aircraft to get airborne carrying a greater weight of fuel than was possible with a normal water take-off. via Heise



Bv 138 of 2. Staffel of Küstenfliegergruppe 306 (II./Kü.Fl 306), which conducted operations over the North Sea and the coast of Norway. via Michulec

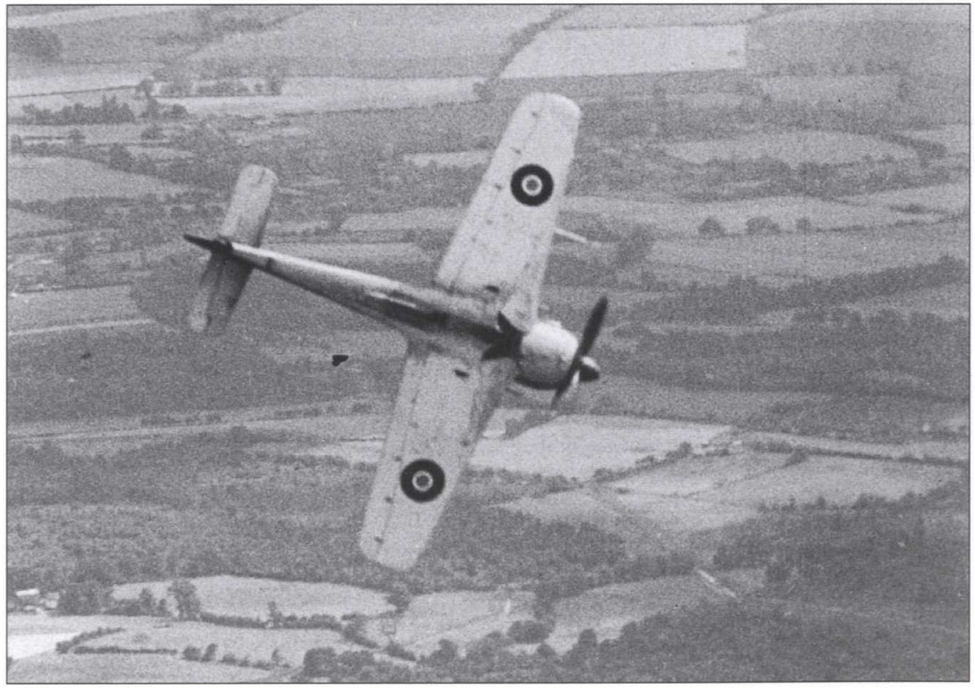


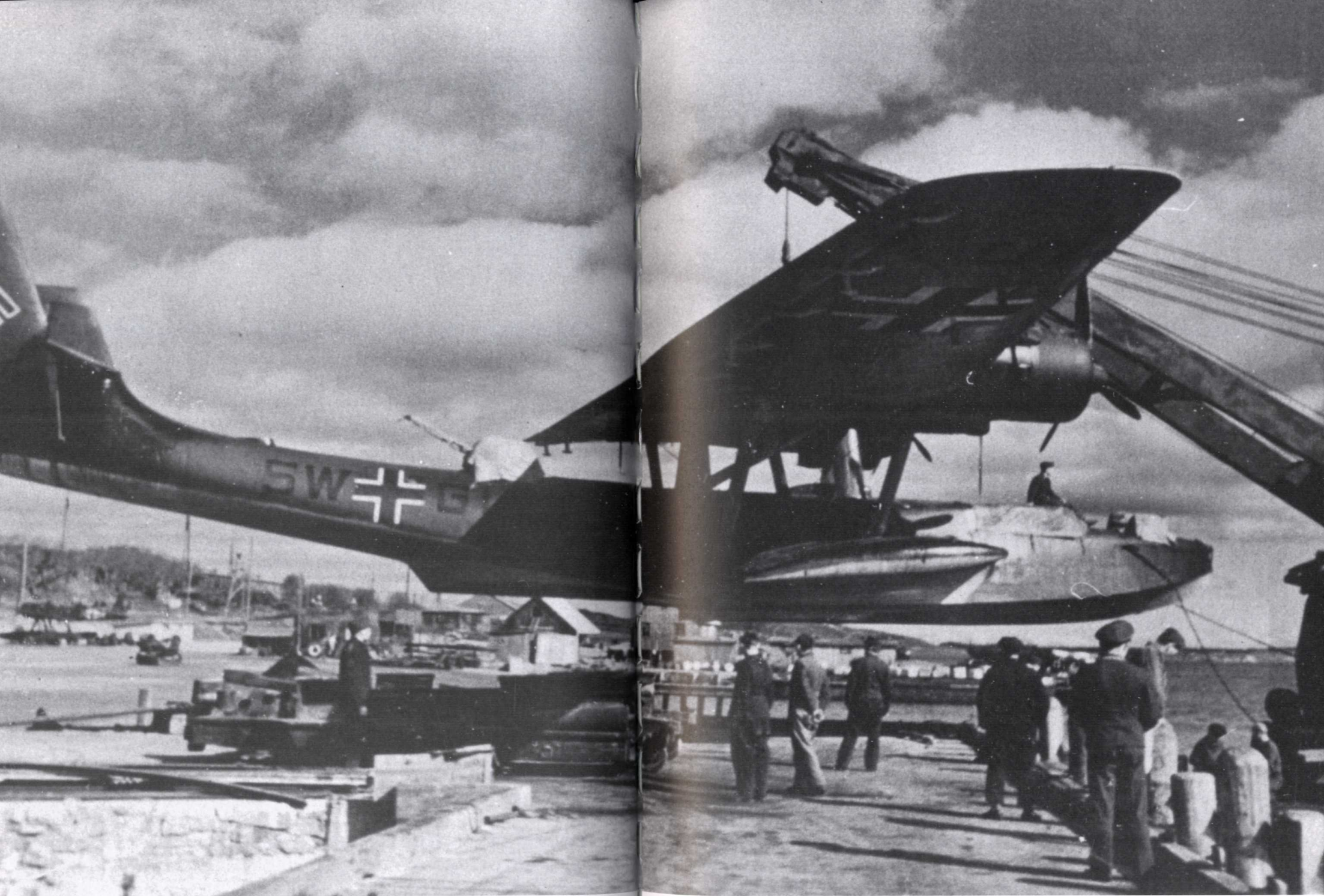
Junkers Ju 88C night fighters of Nachtjagdgeschwader 2 based at airfields in Holland. During 1940 and '41 this unit carried out intruder operations against RAF Bomber Command bases in eastern Britain. Although they rarely shot down bombers, by forcing the use of minimal lighting at airfields they caused an increased accident rate that took a steady toll of bombers and crews. via Schliephake



During 1942 a couple of Junkers Ju 86R high-altitude bombers carried out nuisance attacks on targets in Britain. A development of the Ju 86P, this variant had a longer span wing and featured nitrous-oxide injection to improve the high-altitude performance of the diesel engines. Cruising at altitudes above 40,000 feet, these aircraft could carry only two 550-pound bombs. In September 1942 one of these aircraft was intercepted over Southampton by a specially modified Spitfire IX. The raider was fortunate to escape from the encounter with only minor damage and, as a consequence of this incident, the attacks ceased.

In July 1942, the pilot of this Fw 190 of III./JG 2 became disorientated during a combat over western Great Britain, and inadvertently landed at Pembrey in South Wales. Thus the RAF acquired an airworthy example of the latest German fighter type. The fighter was repainted in RAF roundels and test flown against each front-line British and US fighter type operating in the theatre.



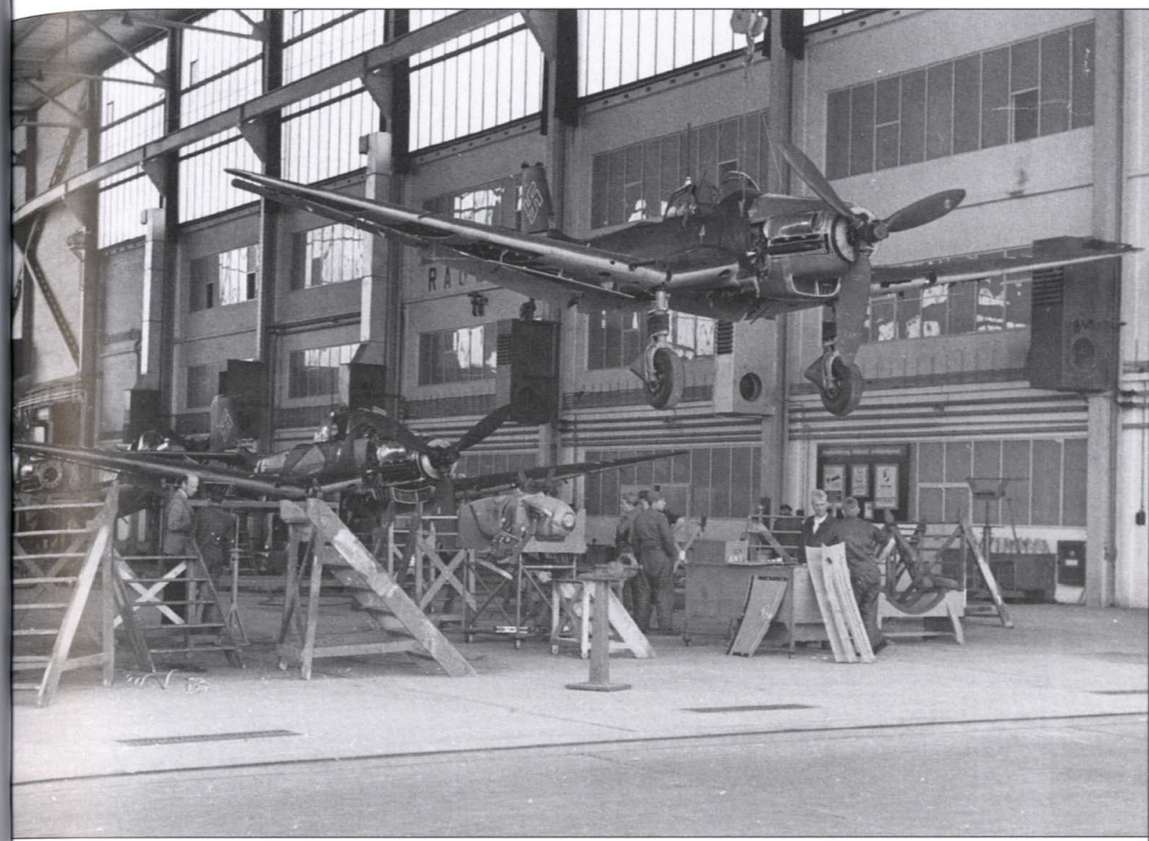


The Dornier Do 24 served in each of the major sea areas, where it operated mainly in the rescue role. This example belonged to Seenotstaffel 10, based at Tromso in Norway. via Michulec

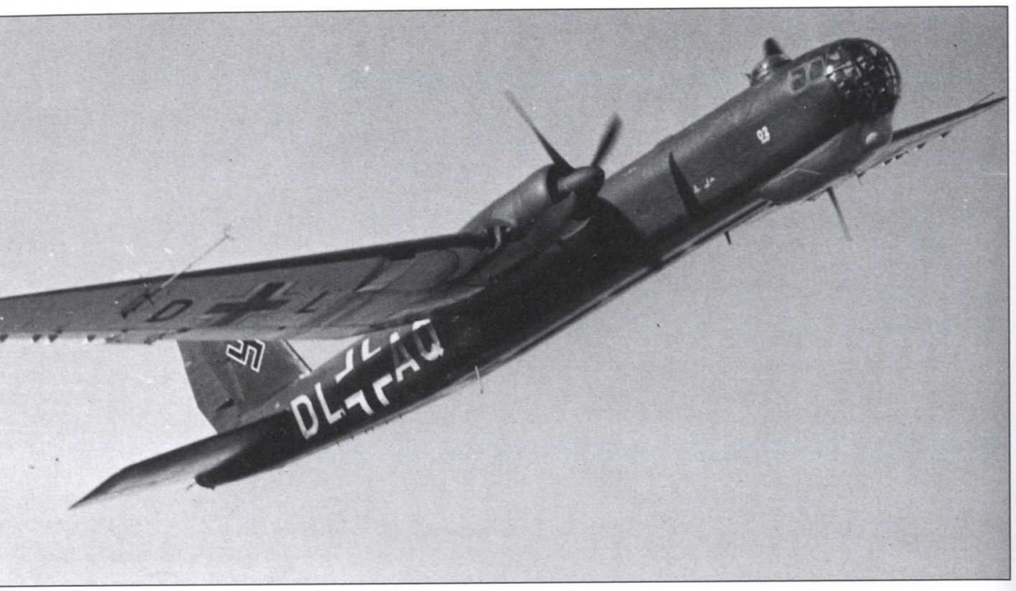
The Home Front

1941 to 1942

The Messerschmitt 210 was designed as a general purpose combat aircraft intended to replace the Ju 87 dive bomber and the Bf 110 in the long-range fighter, fighter-bomber and reconnaissance roles. The Luftwaffe placed an order for 1,000 of these aircraft before the prototype had flown, and the company laid down a large production line. At the same time, production of the earlier types was tailed off in the expectation that large scale deliveries of the Me 210 would commence before the end of 1941. During trials the type demonstrated poor stability, and a tendency to flick into a spin with little warning when flown at low speed at high angles of attack. There were also problems with elevator flutter. After several test crews had been killed, the programme was cancelled early in 1942. Large numbers of incomplete airframes and huge quantities of components had to be scrapped. The Messerschmitt company was forced to meet the costs arising from the fiasco, and had it not been for the company's importance to war production it might have gone bankrupt.

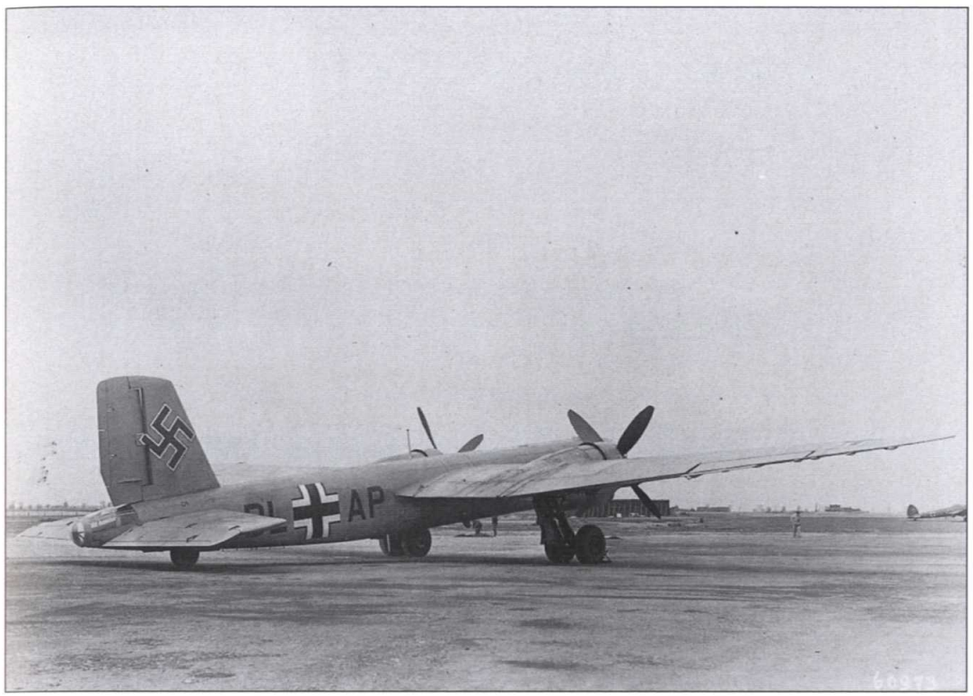


In anticipation of deliveries of the Me 210, production of the Junkers Ju 87 dive bomber tapered off in the autumn of 1941 and in November only two of these aircraft were delivered. Following the cancellation of the Me 210, production of the obsolescent Ju 87 had to be reinstated at the Junkers plant at Berlin-Tempelhof.



The Heinkel He 177 heavy bomber was intended as the standard four-engined heavy bomber for the Luftwaffe. The two engines on each wing were coupled together and drove a single airscrew, giving the aircraft the appearance of a twin-engined machine. via Ethell

The coupled engine arrangement on the He 177 gave constant trouble, however, and several of these bombers were lost following engine fires. A premature attempt to introduce the aircraft into service in 1942 ended in failure, and after several aircraft were destroyed in accidents the type had to be withdrawn for modification. via Schliephake

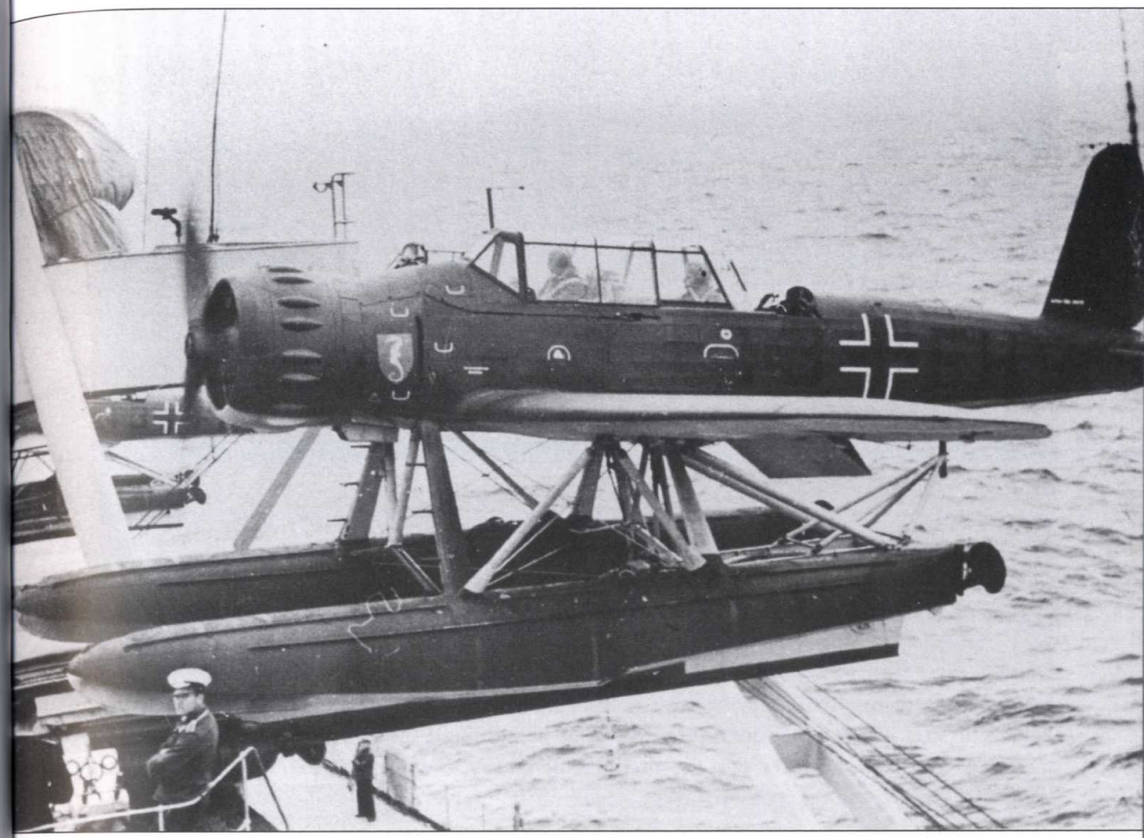


Adolf Hitler's personal aircraft, a Focke Wulf Fw 200 converted for VIP use and coded 26+00. via Schliephake

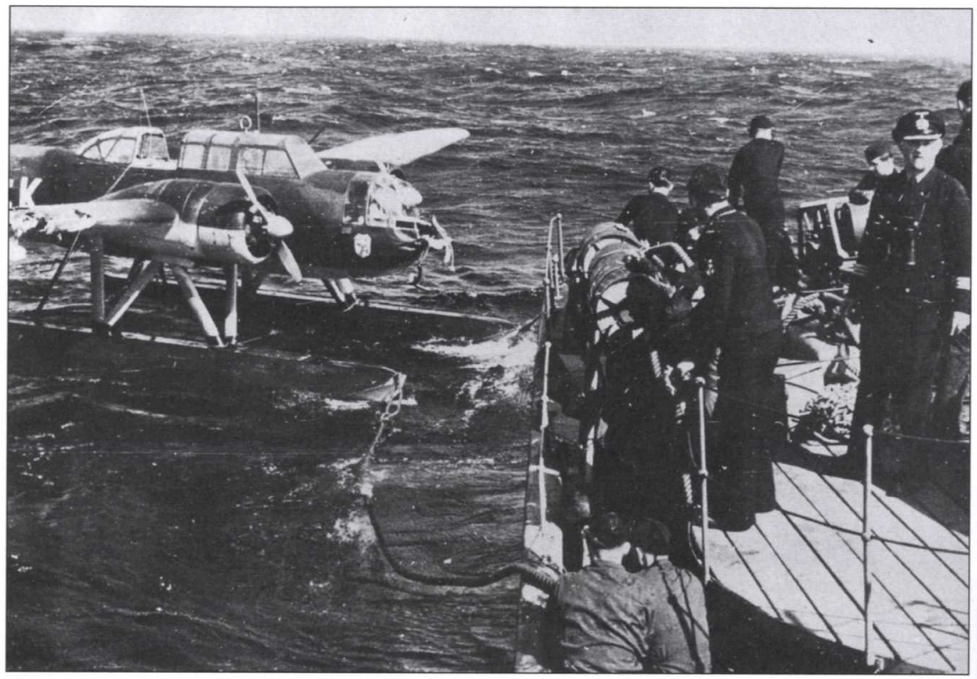
Generaloberst Ernst Udet, the highest scoring German fighter ace to survive the First World War, headed the Luftwaffe Technical Office which was responsible for aircraft production. The office was in charge of the development of new aircraft types. Two of the most important of these, the Me 210 and the He 177, had run into seemingly insuperable difficulties. On top of that, in the autumn of 1941, it became clear that industry was not producing aircraft in sufficient numbers to replace losses on the Eastern Front. In October 1941 Udet was reduced to such a state of despair that he shot himself.

At the time the true cause of Udet's demise was a tightly kept secret. The official death notice stated that he was killed 'while testing a new type of weapon'. Udet received a full state funeral attended by Adolf Hitler, far right. One of the leading pallbearers was Oberst Adolf Galland, fifth from the left. The death of Udet led to another disaster for the Luftwaffe. The fighter ace Werner Mölders, on his way to the funeral aboard an He 111 courier plane, was one of those killed when the aircraft crashed near Breslau.

A tranquil evening scene with Arado Ar 196 reconnaissance seaplanes just off the production line at the company's plant at Warnemünde on the Baltic. via Michulec

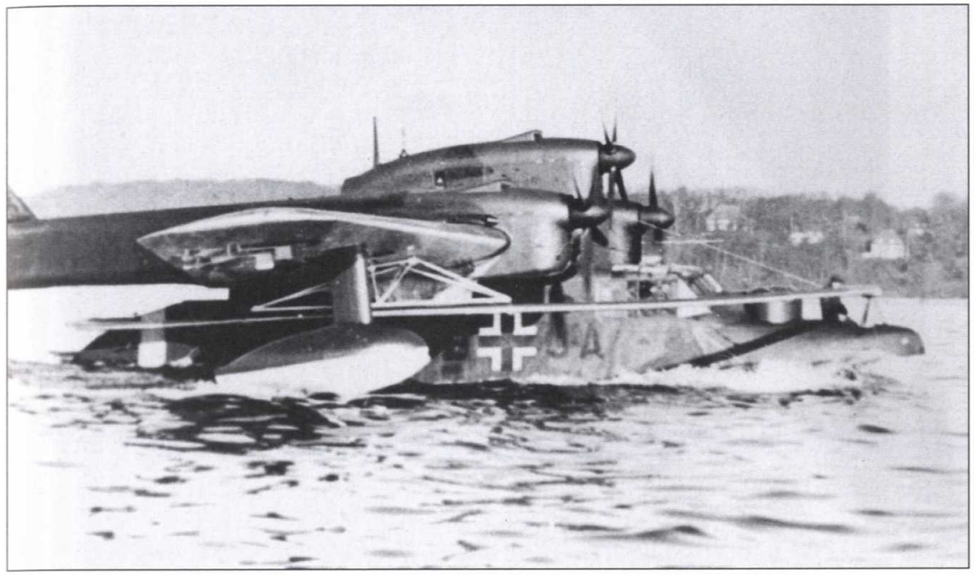


The Ar 196 was the principal floatplane type carried by German warships of cruiser size and larger. This example belonged to Bordfliegerstaffel 196. via Michulec

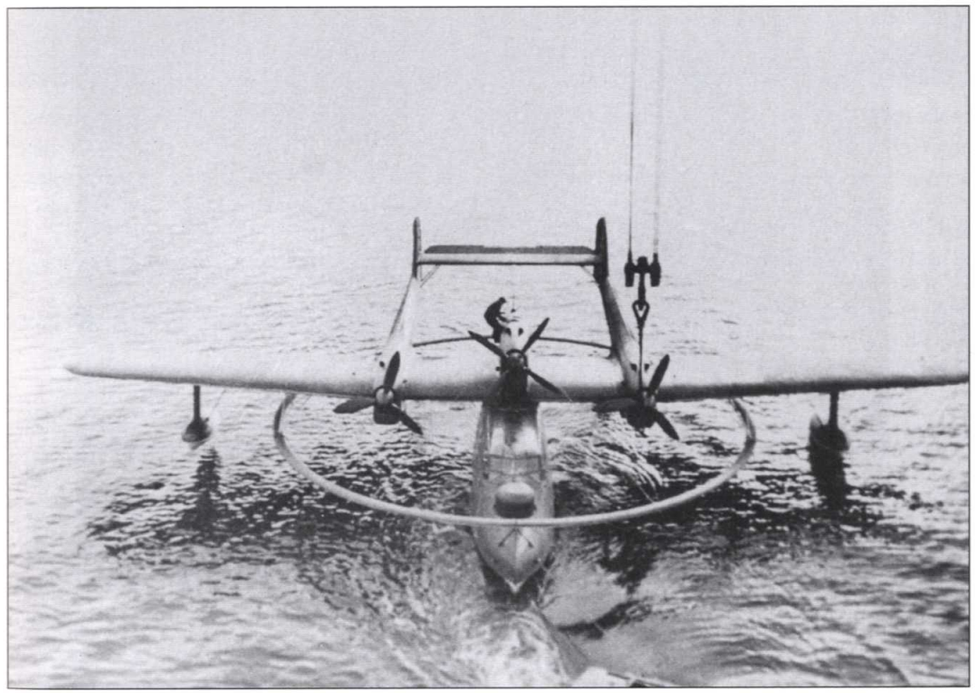


Several types of captured seaplane were pressed into service in the Luftwaffe. This Dutch-built Fokker T VIII of Seeaufklärungsgruppe 126 was being towed by a German warship. This was a difficult operation, however, and the aircraft suffered severe damage to the nose and starboard wing after striking the ship. via Michulec

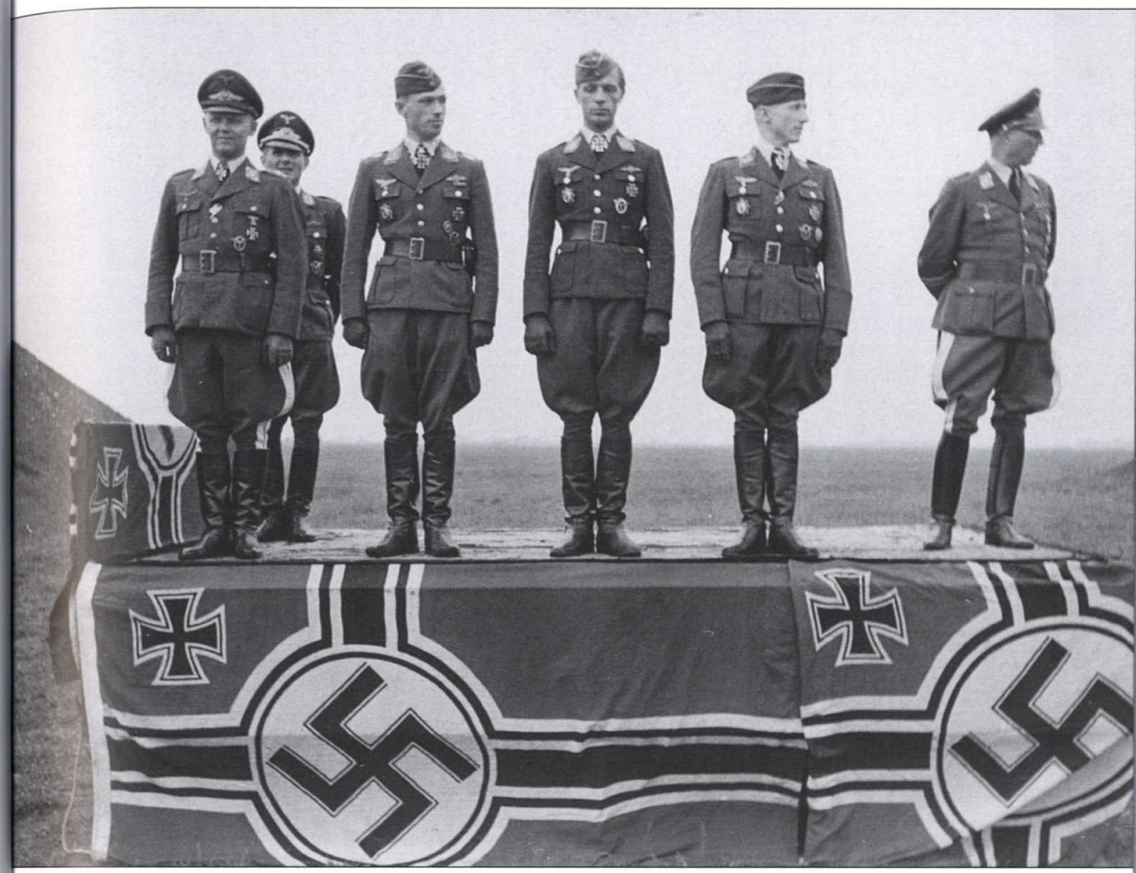
A French Loire 130 flying boat serving with the Luftwaffe. via Michulec



During 1942 the RAF operations to lay mines off German ports began to cause serious losses, particularly among ships transporting high-quality iron ore across the Baltic. Many different aircraft types were fitted with magnetic loop equipment energized by a separate engine in the fuselage to drive a generator to detonate the mines from the air. The loop equipment is seen fitted to a Bv 138 flying boat. via Schliephake

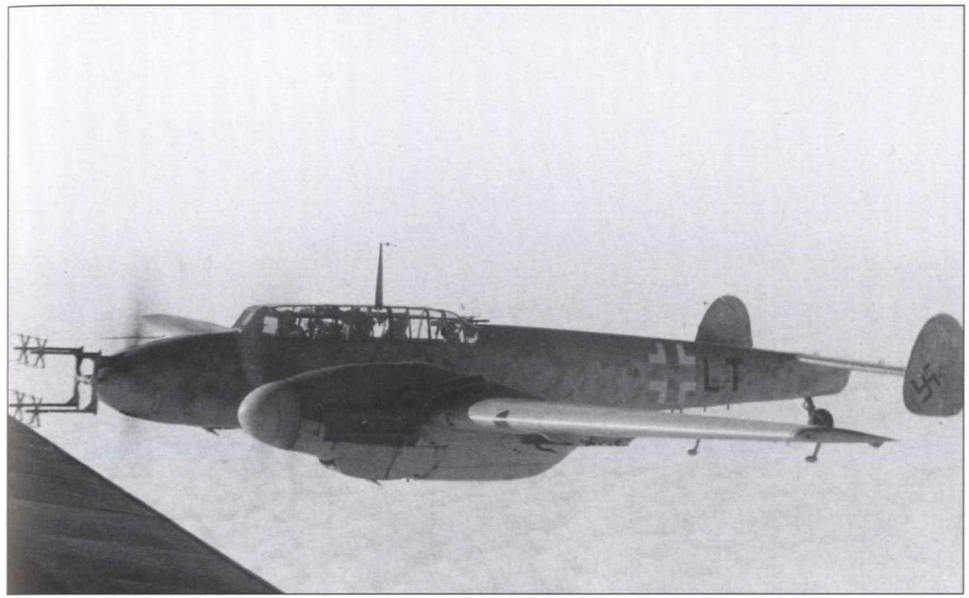


General Josef Kammhuber, the architect of the 'Himmelbett' system of close controlled night fighting developed in 1941.

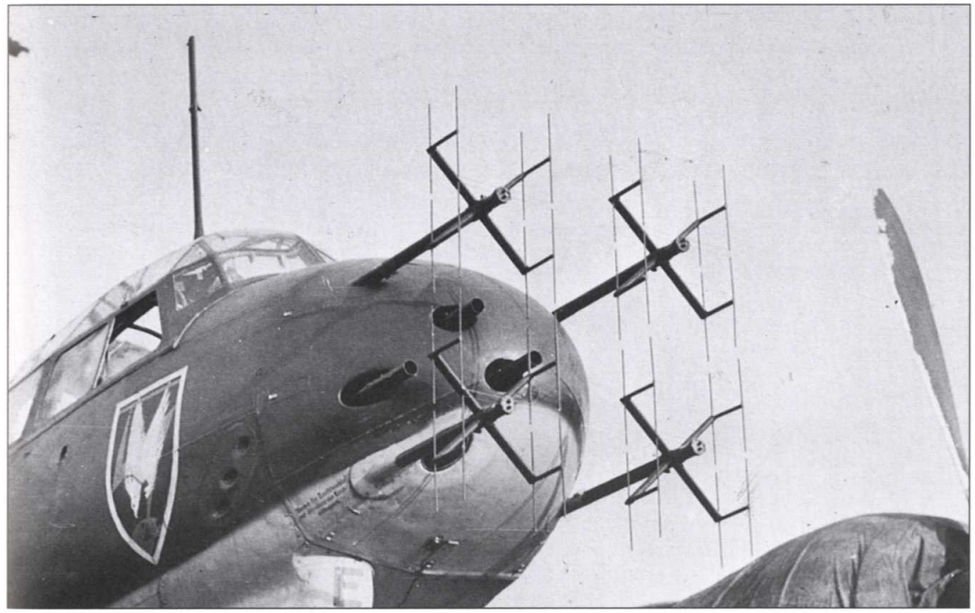


Leading members of the night fighter force in 1942. In the front rank on the podium, from left to right: Generalmajor Josef Kammhuber, Hauptmann Helmut Lent, Oberleutnant Paul Gildner and Hauptmann Ludwig Bekker. The latter three were among the first pilots to achieve major success in this role.

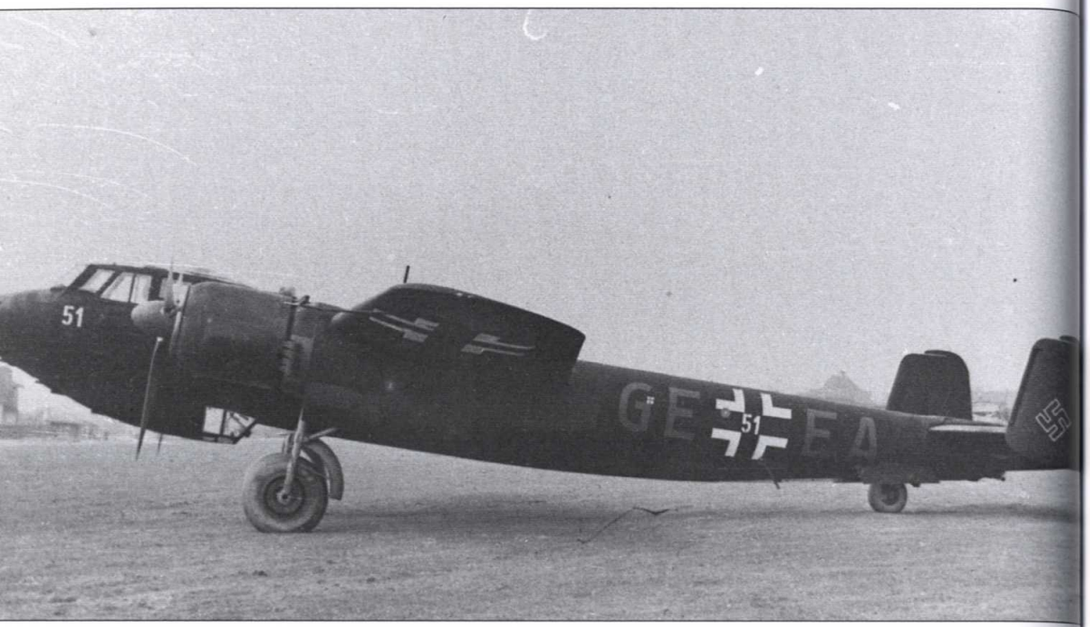
The Messerschmitt Bf 110F was the mainstay of the Luftwaffe night fighter force during the early war years. These examples belonged to Nachtjagdgeschwader 4 (NJG 4).



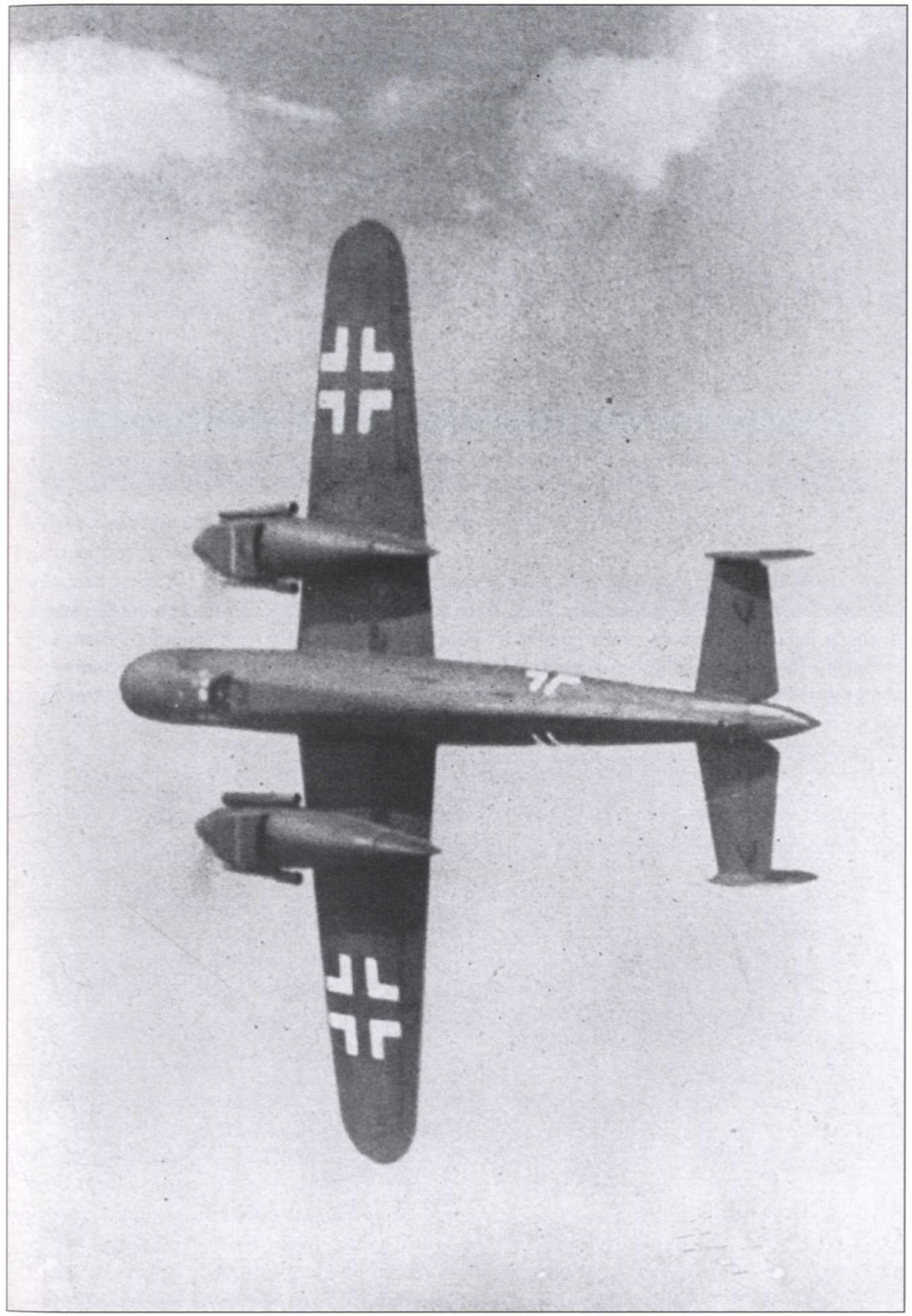
Messerschmitt 110 night fighter of NJG 3, fitted with Lichtenstein airborne interception radar. The set had a maximum range of 2½ miles.

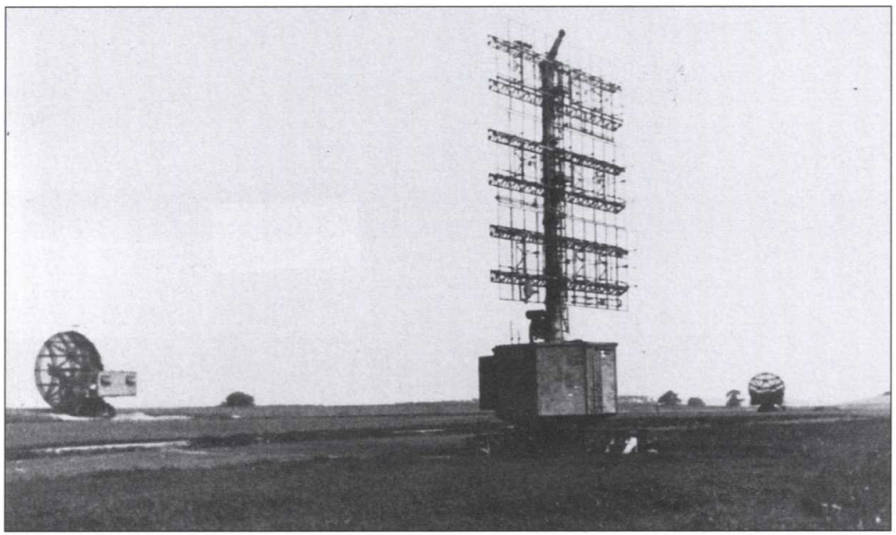


Close-up of aerial array for the Lichtenstein radar, fitted to a Ju 88 night fighter. The drag from the nose-mounted aerials reduced the fighter's maximum speed by about 20 m.p.h.

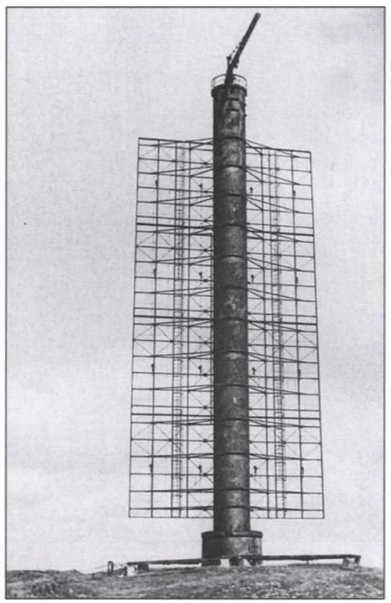


Due to a shortage of Bf 110s in 1942, the Dornier Do 217 was modified as a night fighter and produced in small numbers. Although the type had an excellent endurance, it was sluggish in the climb and it was insufficiently manoeuvrable for this role. The Do 217 was unpopular with night-fighter crews, and after a short period in front-line service it was relegated to the training role.

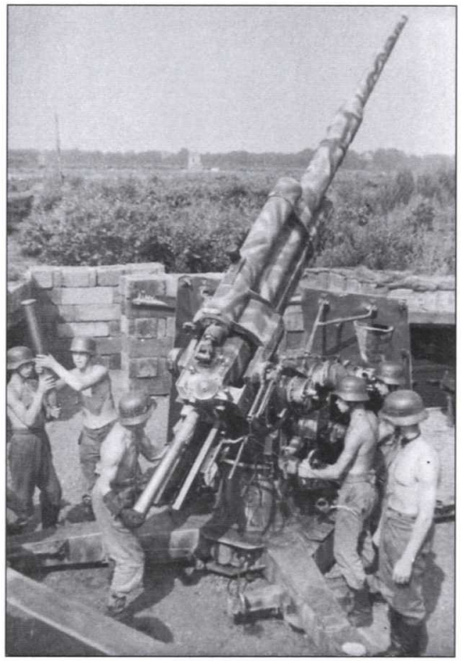




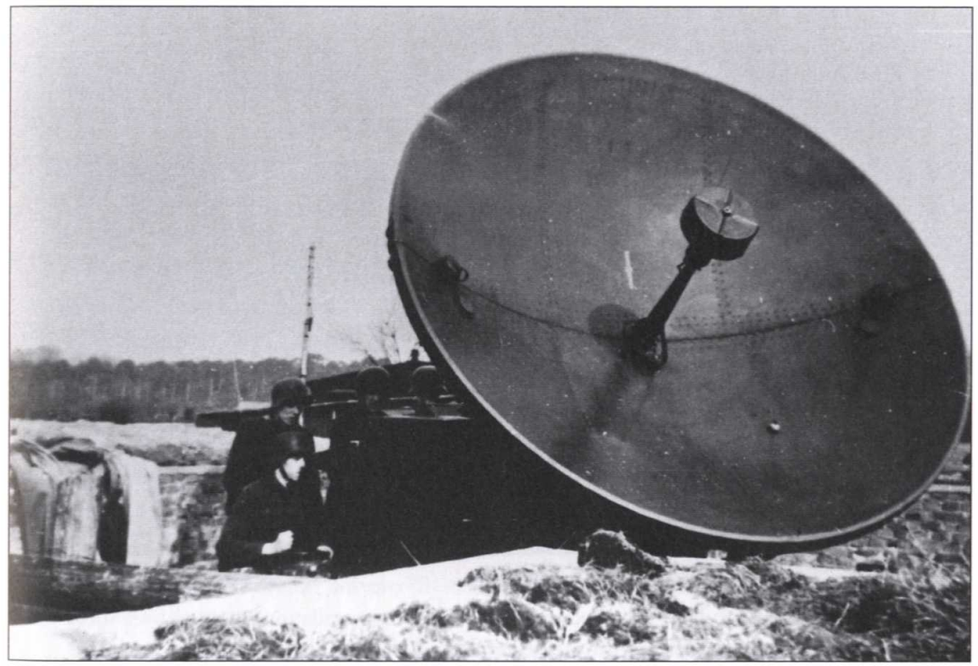
A 'Himmelbett' night fighter control radar station. The Freya radar in the foreground, with a maximum range of 100 miles, provided area surveillance. The two Giant Würzburg pencil-beam precision radars, in the background, each had a maximum range of 50 miles. One of these sets provided tracking information on the enemy bomber, the other tracked the German night fighter. The tracks of the two planes were plotted by hand on a translucent screen, to enable the ground controller to guide the night fighter into position to intercept the bomber. Scores of these stations were erected, forming a defensive line through which raiders had to pass on their way to and from targets in Germany. As the system became progressively more effective, it took a increasing toll of RAF night bombers. via Heise



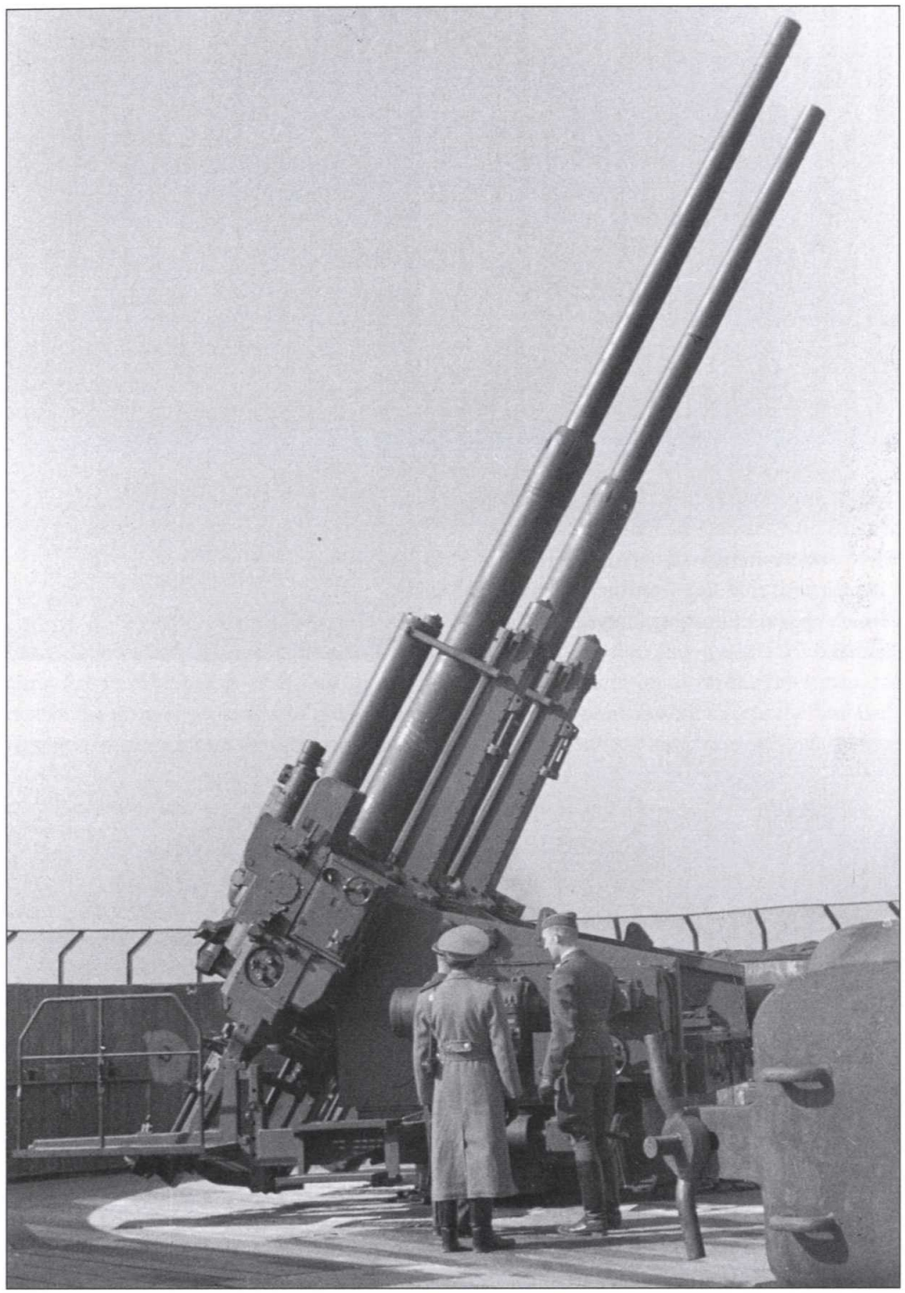
The Wassermann radar entered service in 1942 and added to the effectiveness of 'Himmelbett'. This example was situated near Viborg in Denmark. The Wassermann was the best all-round early warning radar to go into service with any nation during the Second World War. The reflector swung from side to side to scan in azimuth, and the radar beam was swept electronically in the vertical plane to measure the altitude of target aircraft.



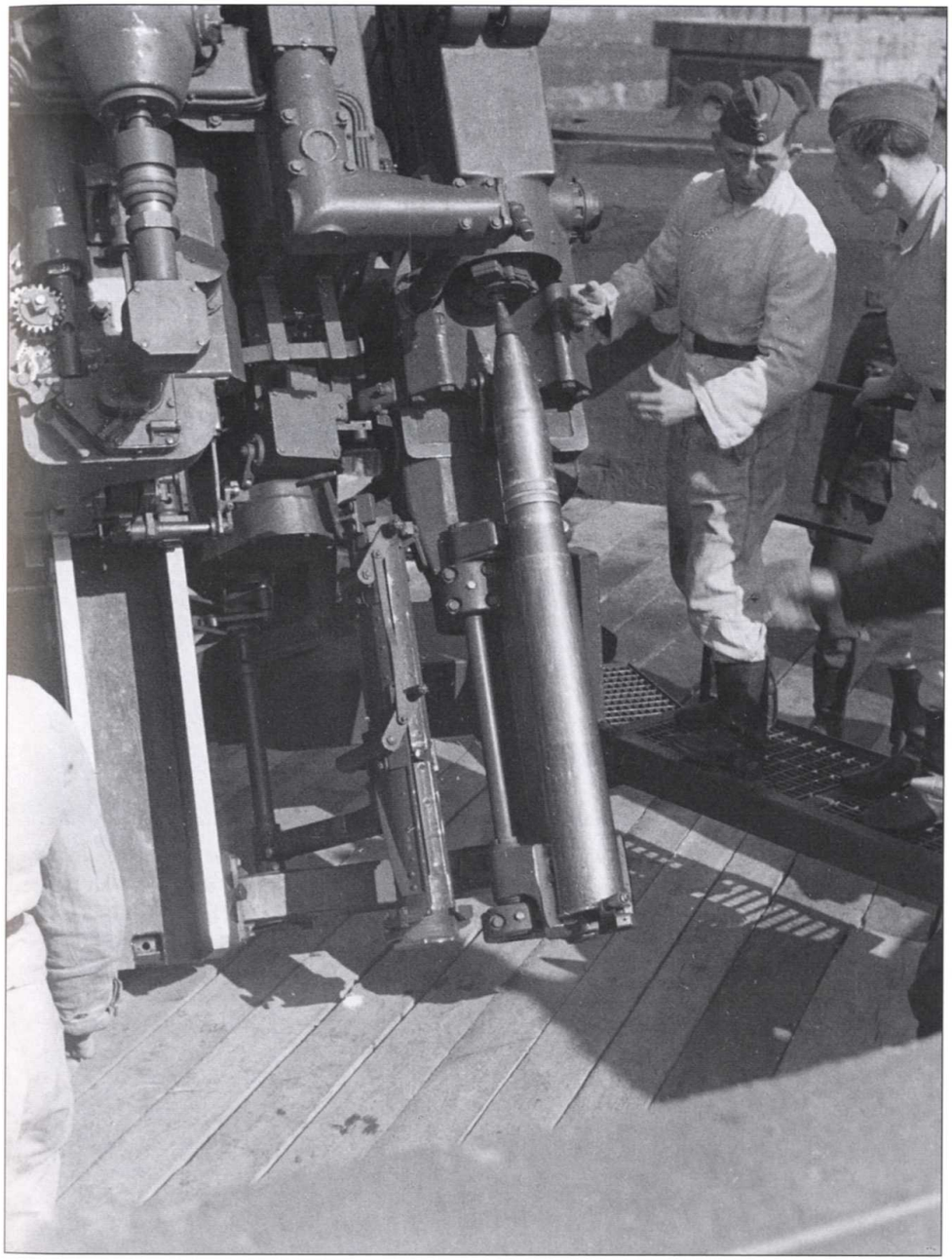
The Flak arm of the Luftwaffe was responsible for the point defence of potential targets in the German homeland. During 1942, as the RAF night raids on Germany increased in severity, the force underwent a massive expansion. The mainstay of this arm was the 8.8 cm gun which appeared in several versions. via Schliephake



The standard radar equipment for directing searchlights and AA fire was the Würzburg. For its day it was an advanced system, operating on frequencies in the 560 MHz band.



Introduced into service in 1942, the 12.8 cm Flak 40 was the heaviest anti-aircraft weapon employed by the Luftwaffe. This example was the twin installation, mounted on some of the massive Flak towers erected for the defence of major cities.



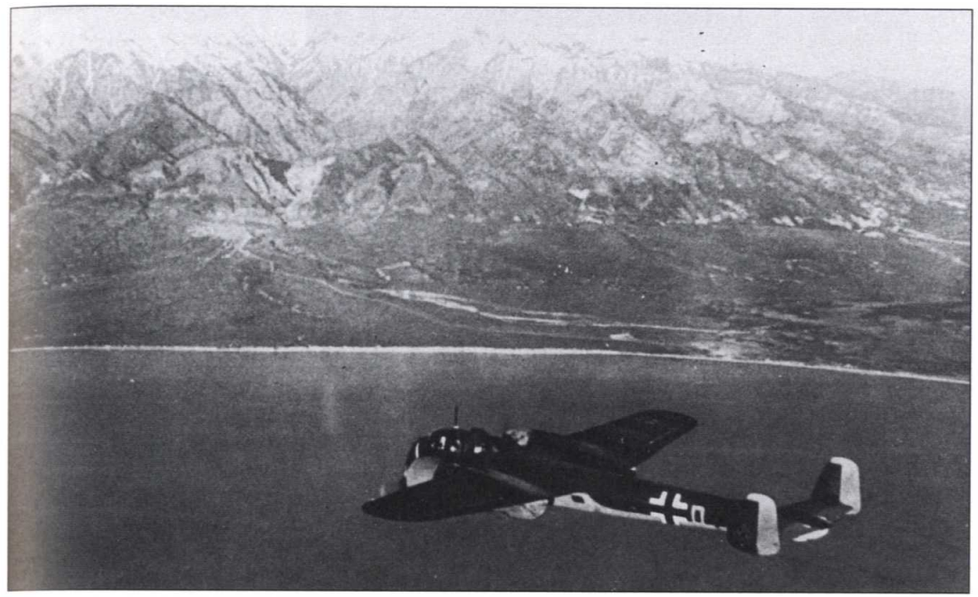
Close-up of the fuse setter and powered ramming mechanism, to feed the hefty shells into the breech of the 12.8 cm gun.

The Blohm und Voss Bv 141 short-range reconnaissance aircraft was surely one of the oddest looking combat planes ever built. The reason for the lop-sided design was to provide the crew with the best possible all-round view. During flight tests the aircraft exhibited surprisingly good handling characteristics, but conservatism prevailed and the type was never ordered into production. via Schliephake

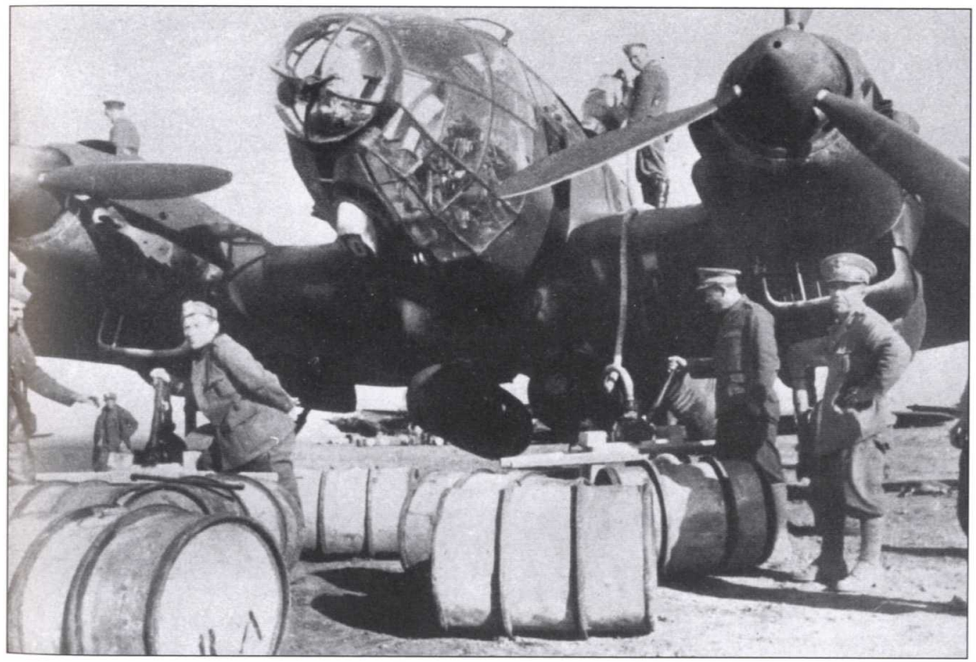
THE MEDITERRANEAN THEATRE

1941 TO 1942

Messerschmitt Bf 110s from III./ZG 26 during the campaign in Greece, spring 1941. Haugk

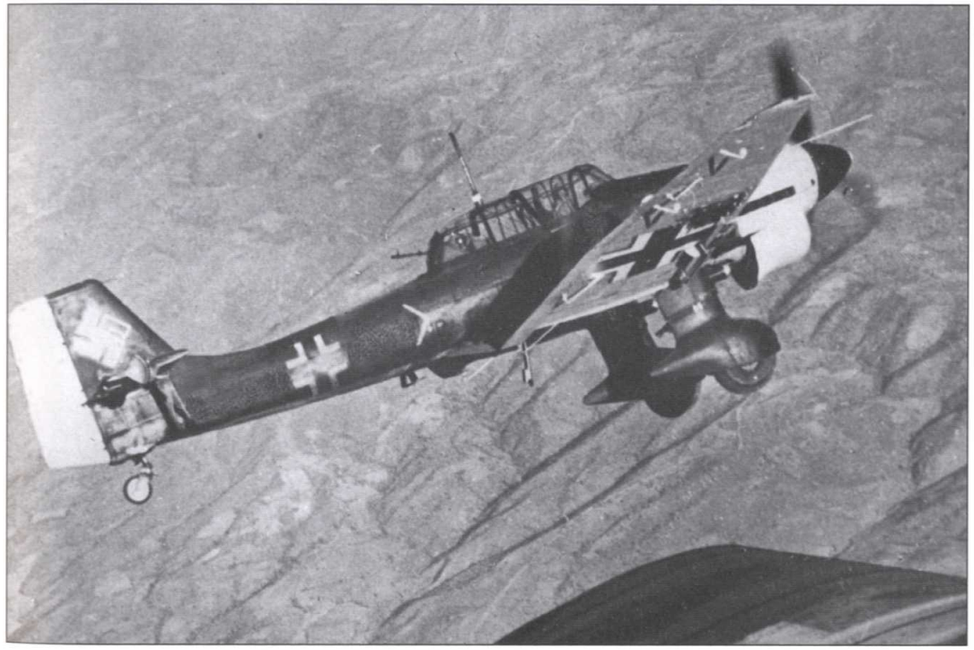


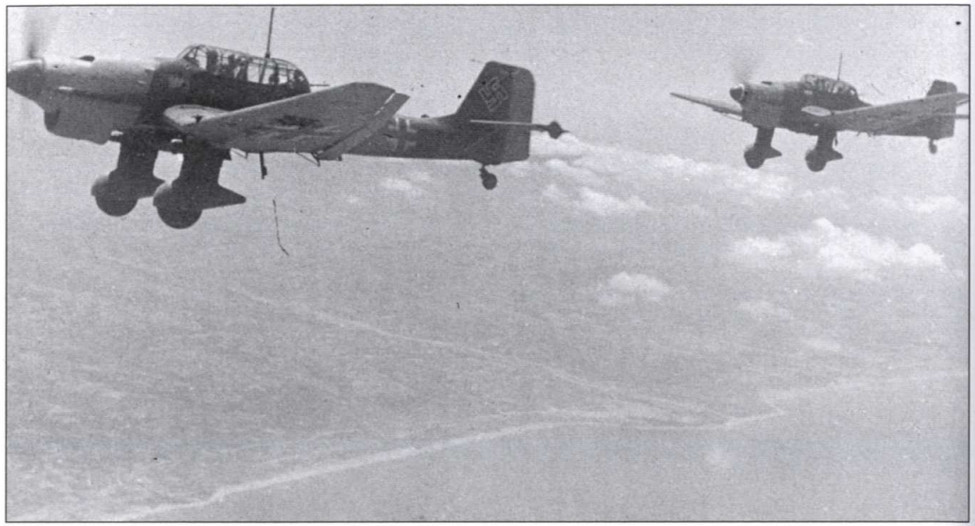
Do 17 of KG 2 with bright yellow engine cowlings and rudders, which served as identification markings for Luftwaffe bombers during the Balkans campaign.



Italian airmen at the airfield on Rhodes assist with the refuelling of an He 111 of KG 4. Beneath the bomber are two LMB 1,000-kg magnetic mines, probably intended for the approaches to Alexandria harbour or the Suez Canal. via Michulec

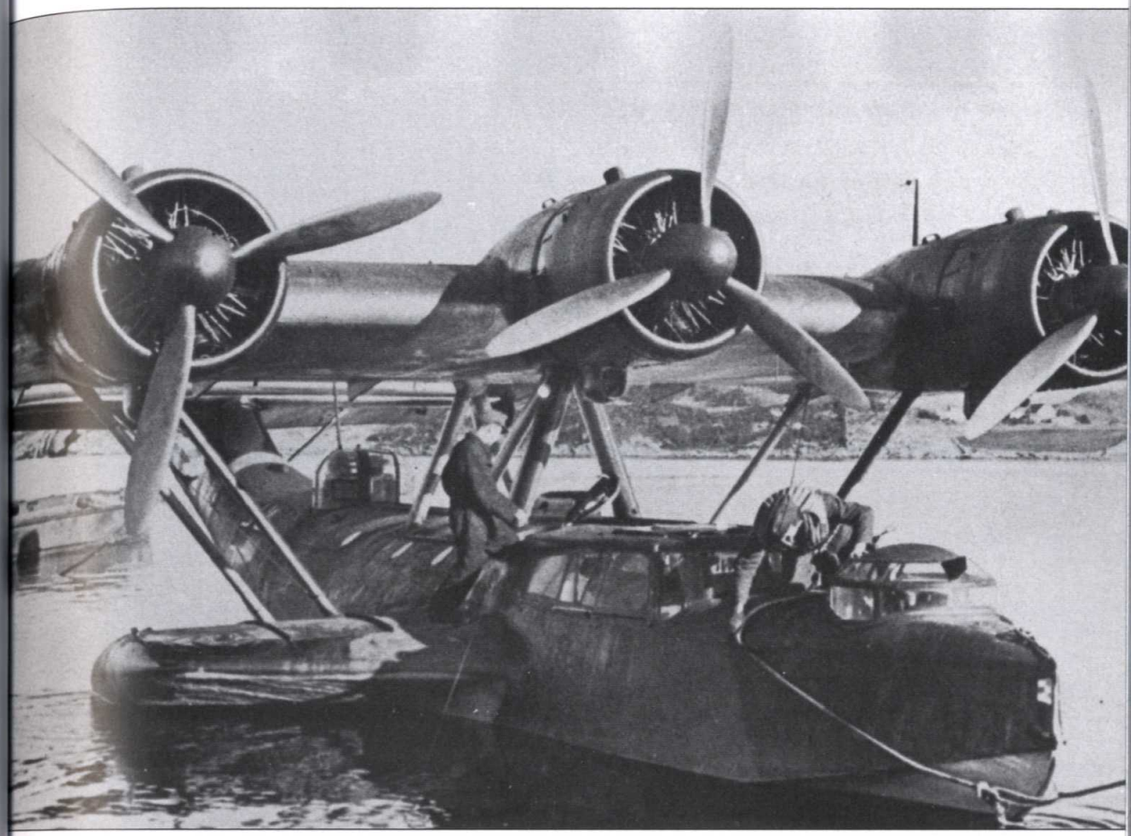
Ju 87 dive bombers of StG 77 operating from Prilep in Yugoslavia during the campaign against Greece. Note the yellow cowlings and rudders to assist identification in the theatre. Schmit





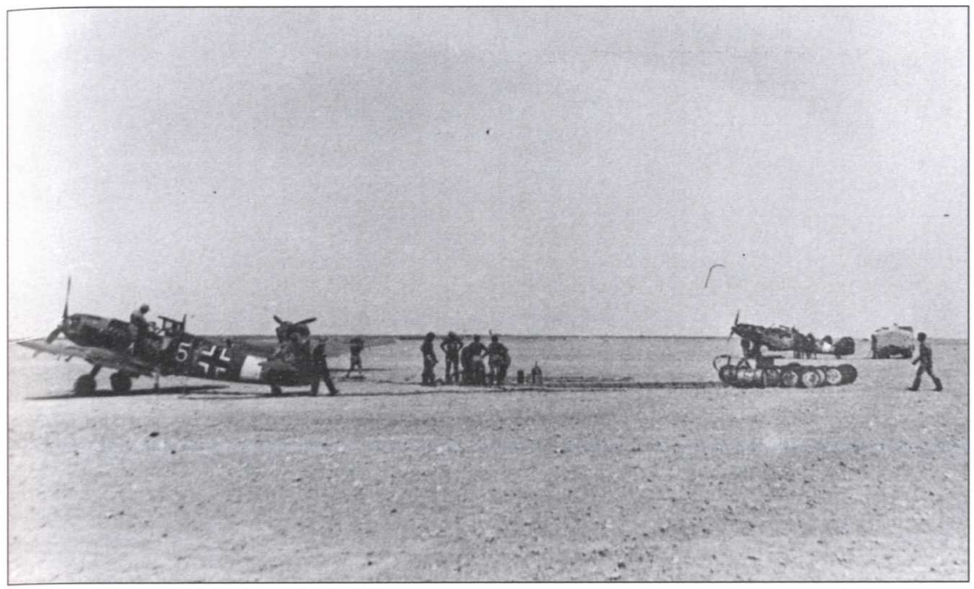
Bombs under their fuselages, a pair of Ju 87s of I./StG 77 head for a target on Crete in May 1941. Scheffel

The airfield at Malemes, Crete, following its capture by German airborne troops. Several of the aircraft around the landing area had been wrecked or seriously damaged by British artillery fire before the area was secured. Scheffel



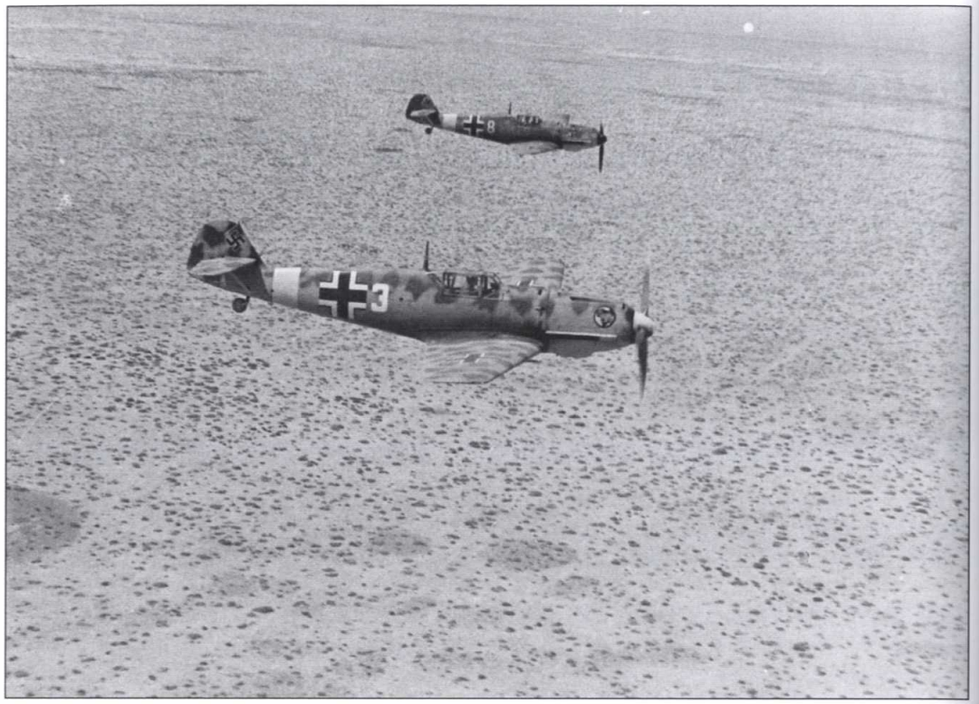
The three-engined Dornier Do 24T flying boat saw extensive use in the Mediterranean area, where it served in the air-sea rescue, maritime reconnaissance and air-transport roles. via Michulec

Bf 109E of JG 26 in the foreground, Bf 110C of III./ZG 26 in the background, at a landing ground in North Africa.

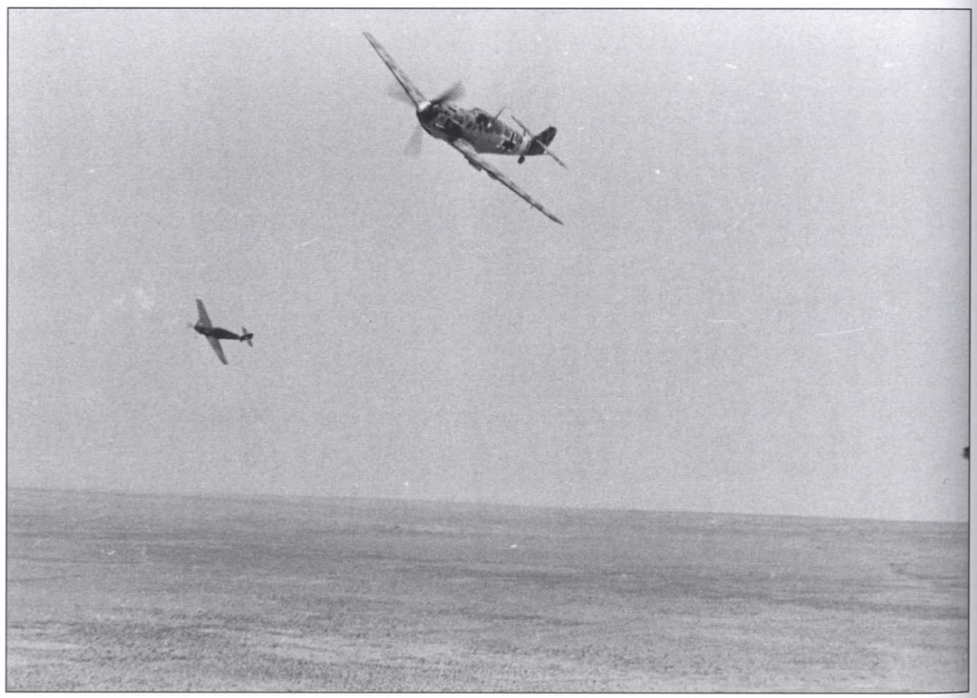


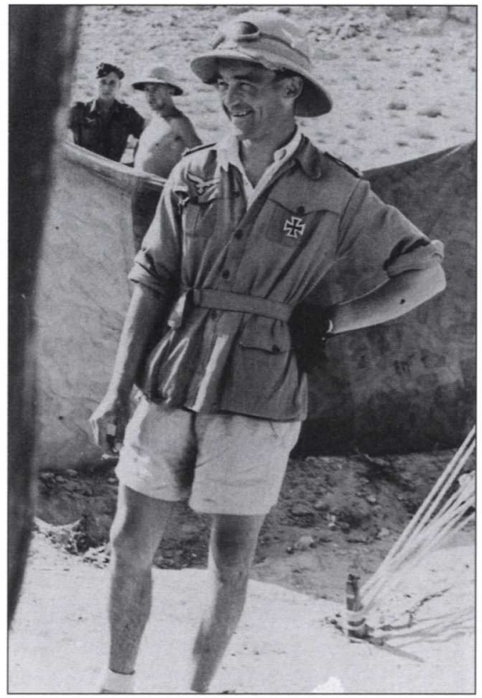
Bf 109Es of JG 27 dispersed around the forward landing ground at Gambut in Libya. The photograph shows the primitive conditions under which the unit had to operate. Schroer

Battle scramble by Bf 109Fs of II./JG 53, the 'Ace of Spades' Geschwader, at an airfield in Sicily.



A pair of Bf 109 'Emils' of JG 27 on patrol over the North African desert.

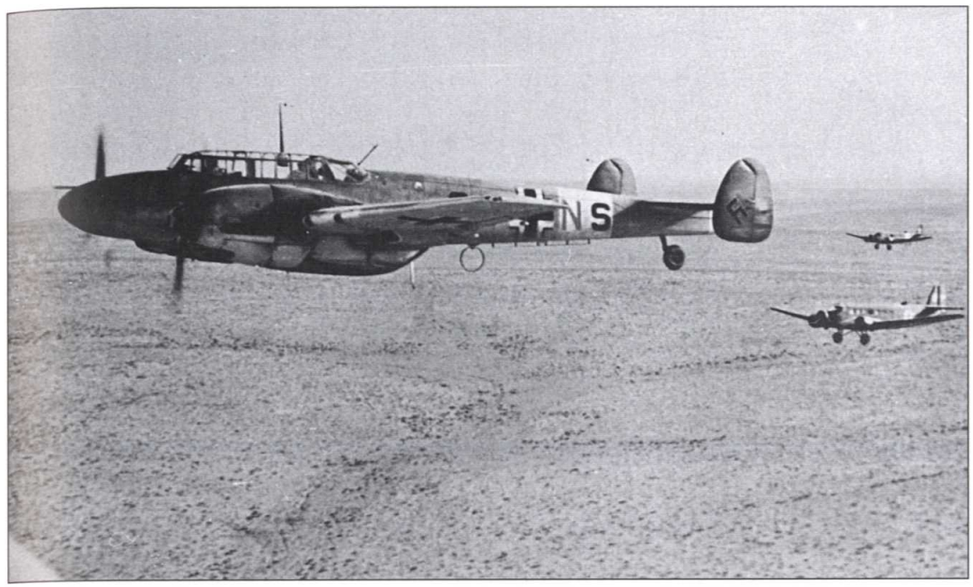




Oberstleutnant Edouard Neumann, the commander of JG 27 from June 1942.

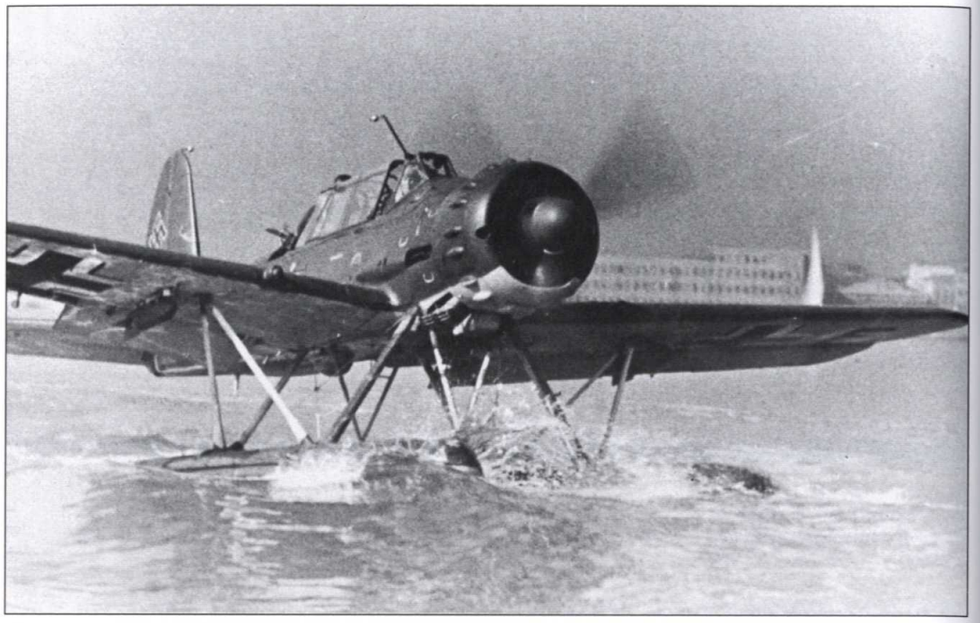
Neumann in the cockpit of his Bf 109G-2. via Michulec

Hauptmann Hans Joachim Marseille of JG 27, the most successful German fighter pilot in Africa. At the time of his death in a flying accident in September 1942 his victory score stood at 158.



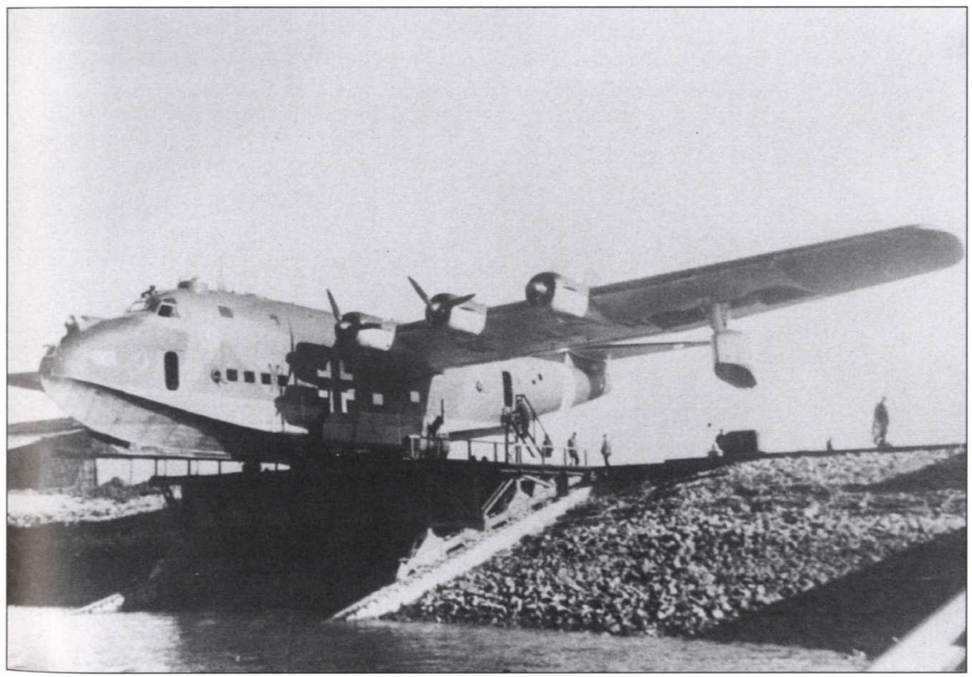
Throughout the campaign in North Africa the Germans made large-scale use of transport planes to bring in supplies and fresh troops, and the latter often came under attack from Allied fighters. Here a Bf 110 of ZG 26 is seen escorting a pair of Ju 52 transports over North Africa.

Soldiers deplaning from a Ju 52, after their arrival in North Africa. via Michulec



Ar 196s operating from a seaplane base near Venice. These aircraft, belonging to 4. Staffel of Bordfliegergruppe 196, were engaged in armed reconnaissance and convoy protection operations over the Adriatic. via Rigglesford

Originally designed for Deutsche Luft Hansa to serve on the airline's planned trans-Atlantic service, the giant Blohm und Voss Bv 222 flying boat was built in small numbers for the Luftwaffe. These aircraft served with Lufttransportstaffel 222, and were used mainly to carry supplies to North Africa and evacuate casualties. via Schliephake



Bv 138 flying boat, believed to be from Seeaufklärungsgruppe 125, which operated this type over the Mediterranean during 1942.

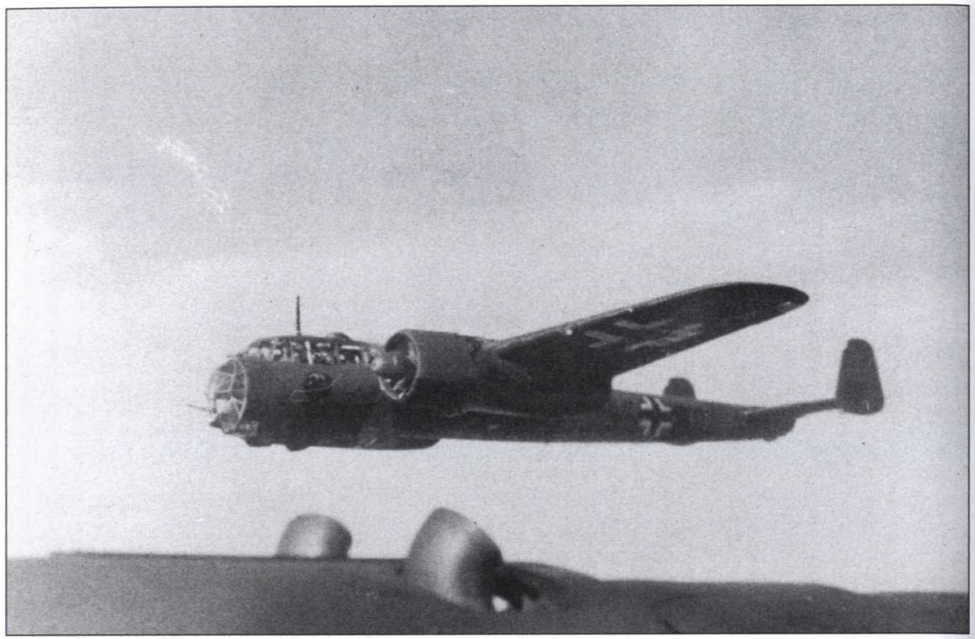
The aircraft carrier HMS *Indomitable* and the cruiser HMS *Phoebe* under attack by Stukas of I./StG 3 off Sicily, 12 August 1942. The carrier, trailing dense smoke after taking two direct hits on her flight deck, is making a tight evasive turn. The damage was so serious that the carrier was unable to operate aircraft and had to return to Gibraltar for repairs.

THE EASTERN FRONT

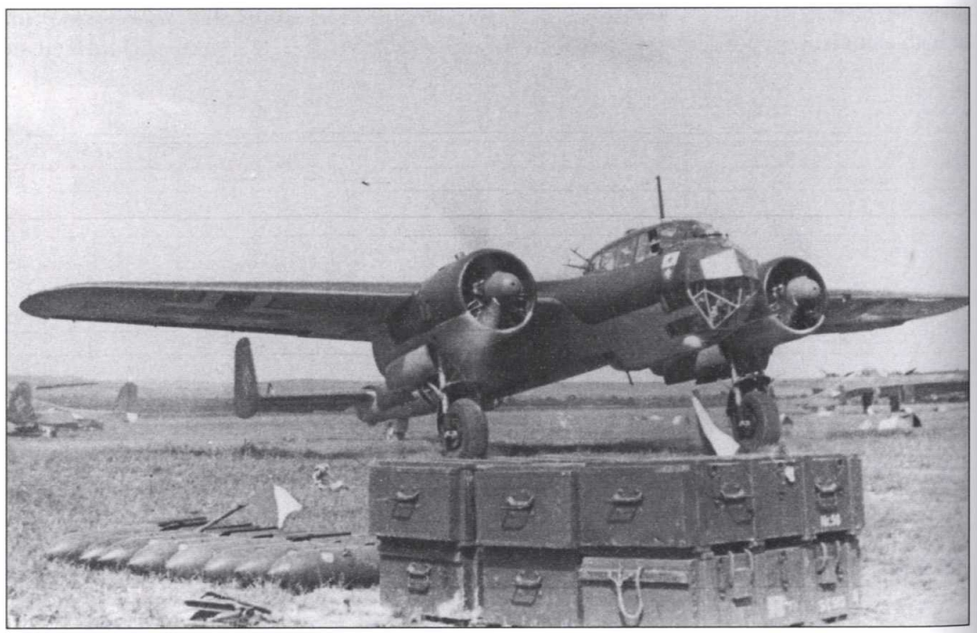
1941 TO 1942

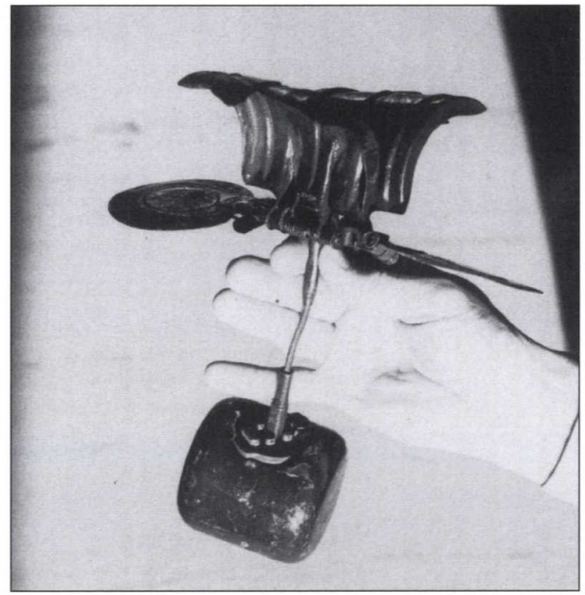
Bf 109 'Emils' of JG 52 at Kabaracie, Rumania, in the spring of 1941 shortly before the attack on the Soviet Union. The 'snake' marking on the rear fuselage indicated that these aircraft belonged to the IIIrd Gruppe.

Me 109 'Friedrich' of JG 54 beside a captured Soviet I-16 fighter. The more powerful and cleaner-lined German fighter had a considerable speed advantage over its enemy counterpart, especially at high altitude.



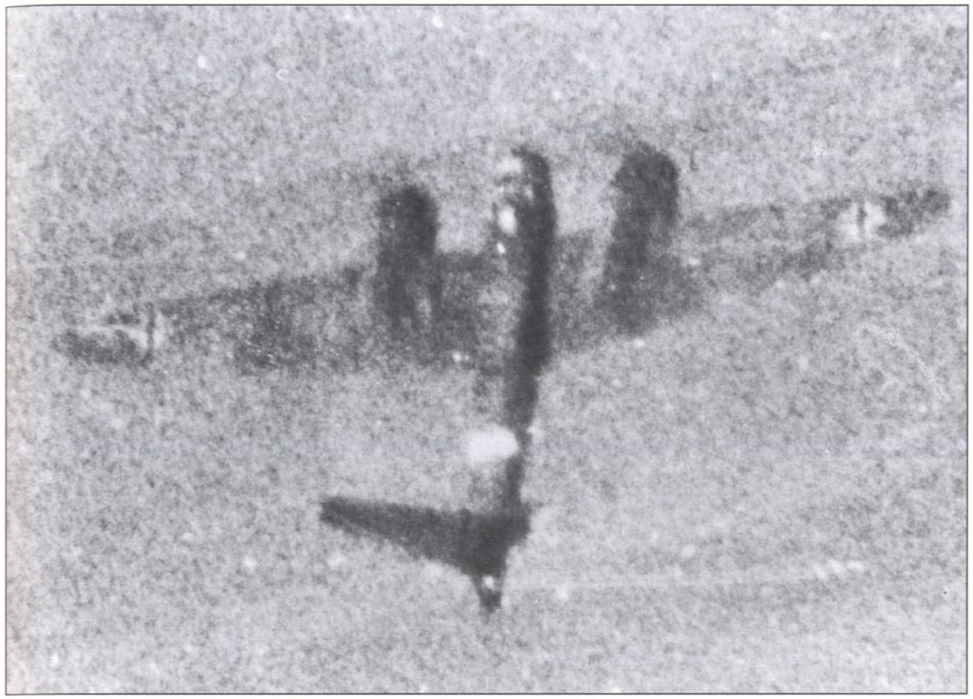
During the early months of the campaign on the Eastern Front, KG 3 flew Do 17s for a short period before the Geschwader re-equipped with Ju 88s. Note the bombs and ammunition boxes laid out on the grass in the foreground in readiness for the next mission (below). Schultz



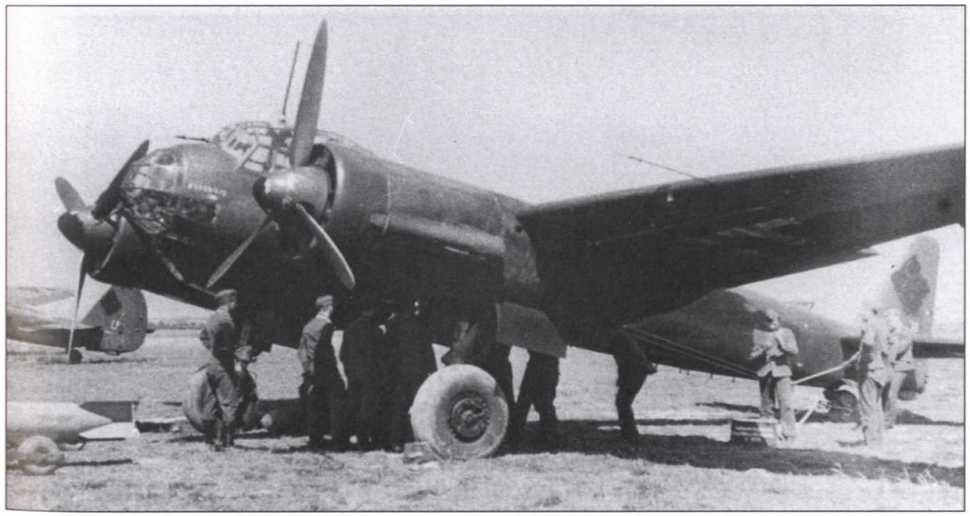


The SD-2 fragmentation bomb (above) was unleashed at the beginning of the invasion of the USSR. A Ju 88 or a Do 17 could carry up to 360 of these weapons; a Bf 109 or a Ju 87 could carry up to 96. Nicknamed the 'Butterfly Bomb' by the Allies, the weapon was very effective against personnel in the open, soft-skinned vehicles or aircraft on the ground.

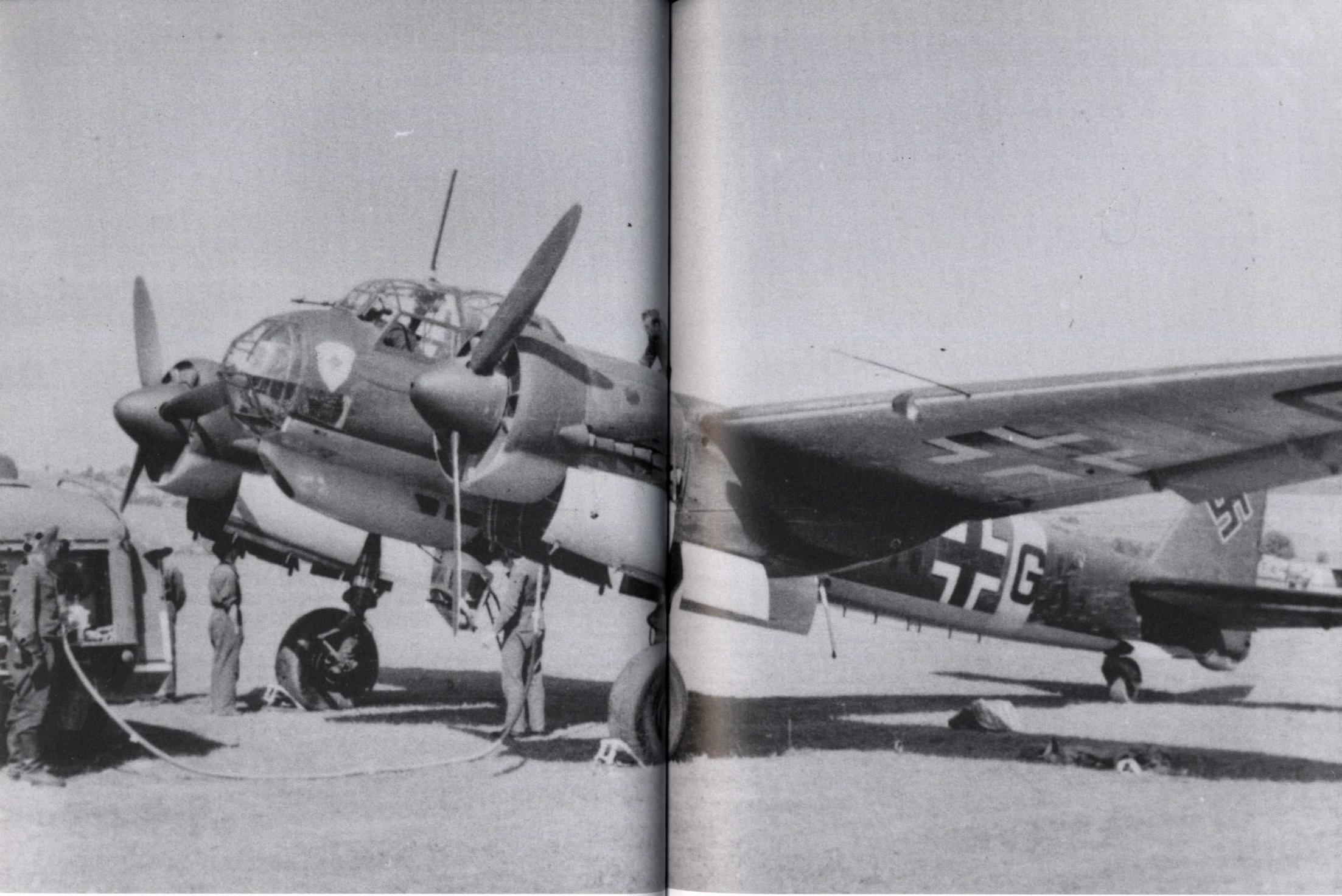
The airfield at Schaulen in Lithuania, seen after its capture by German ground forces. Large numbers of Soviet aircraft lay around the airfield, many of them damaged but some still in an airworthy condition. Note the Gloster Gladiator in the background, one of several examples purchased by the Lithuanian Air Force before the war. Lukesch



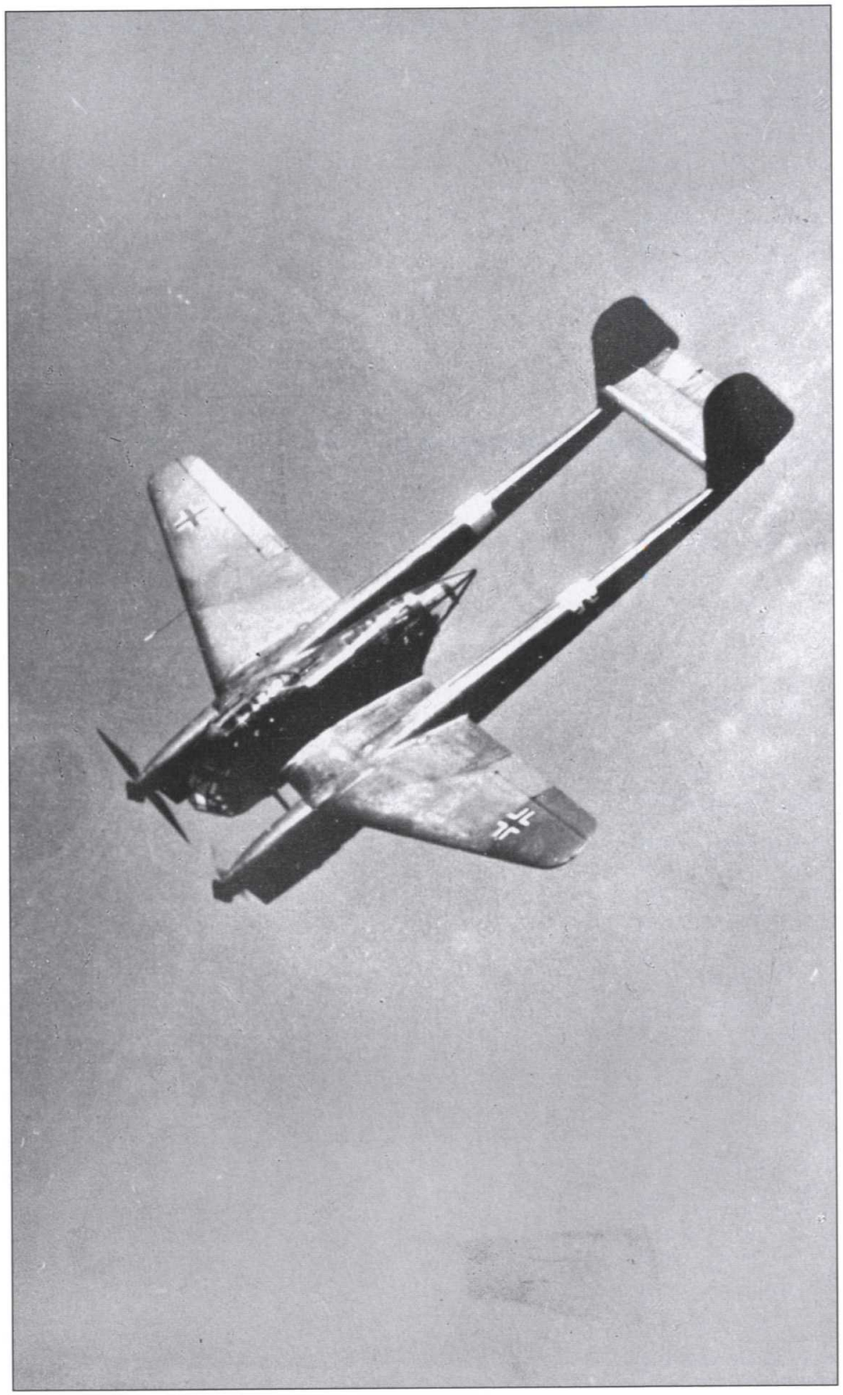
In time of war aircraft sometimes remain airborne despite having suffered horrific battle damage. This Ju 88 was struck by a Soviet fighter during a combat over the Black Sea on 16 August 1941. The collision tore away the bomber's starboard tailplane and twisted the rear fuselage 40–50° out of alignment. Leutnant Unrau of I./KG 51 managed to hold the aircraft in the air long enough to regain friendly territory in Rumania, where the crew parachuted to safety. via Dierich

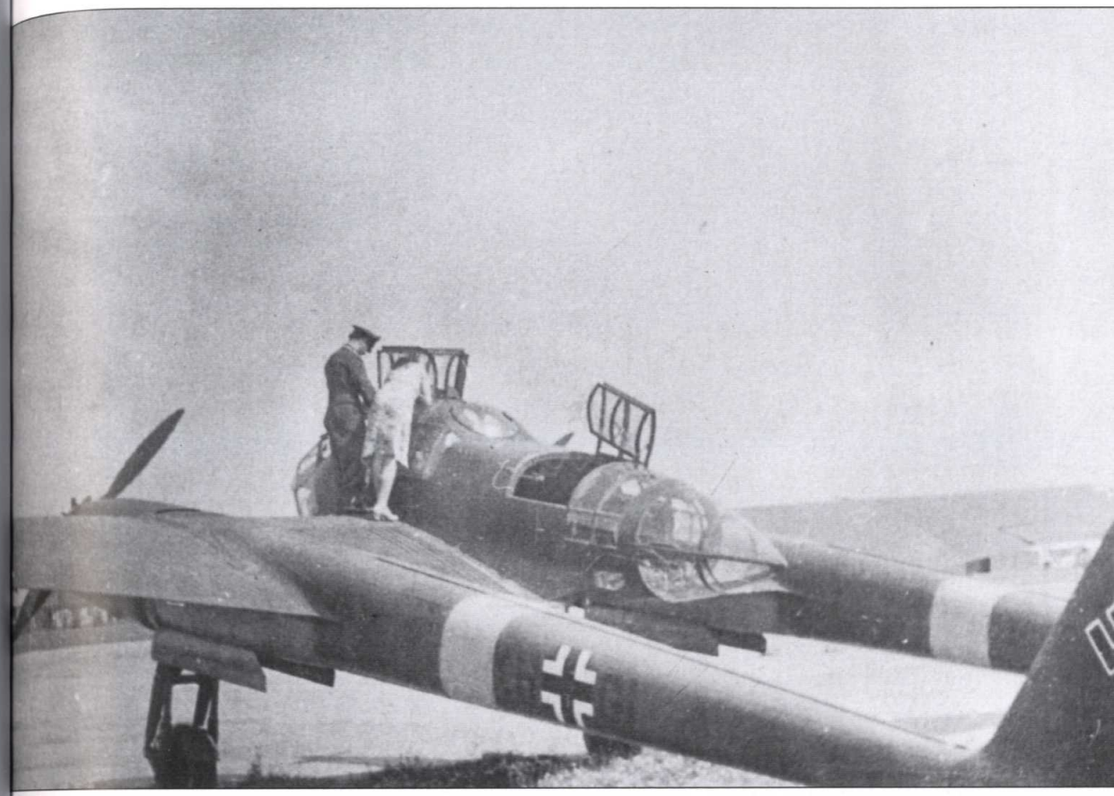


Ju 88 of KG 3 at a landing ground on the Eastern Front. Schultz



The Junkers Ju 88D was the mainstay of the long-range reconnaissance units for most of the war. This example belonged to Aufkl.Gr 22, serving on the Southern Front in Russia.



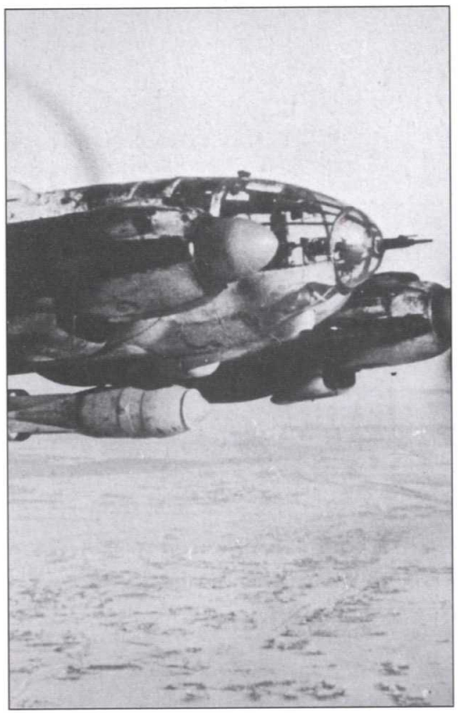


The Focke Wulf Fw 189 tactical reconnaissance and army co-operation aircraft was employed in large numbers on the Eastern Front. It carried a crew of three and the extensive glazing provided them with a good all-round visibility. So long as the Luftwaffe held air superiority the aircraft was highly effective, but its maximum speed of only 217 m.p.h. rendered it vulnerable if it came under attack from enemy fighters.

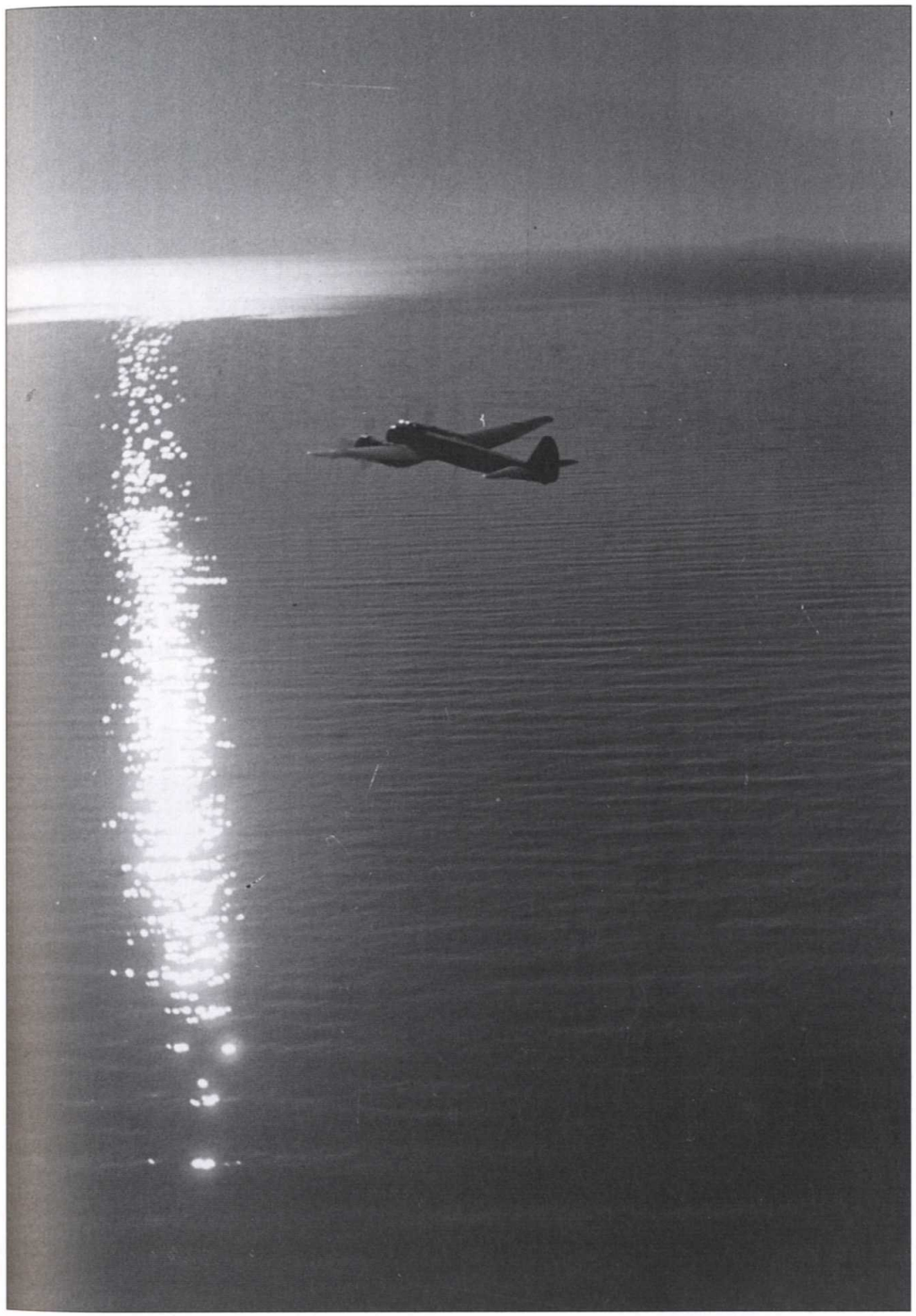
Bf 110 reconnaissance aircraft of 3. Staffel, Aufkl.Gr 11 at a forward airstrip on the Southern Front in Russia. via Michulec

The Fiesler Fi 156 Storch, with an outstanding short take-off and landing capability, was used in large numbers on the Eastern Front as a light transport and liaison aircraft.

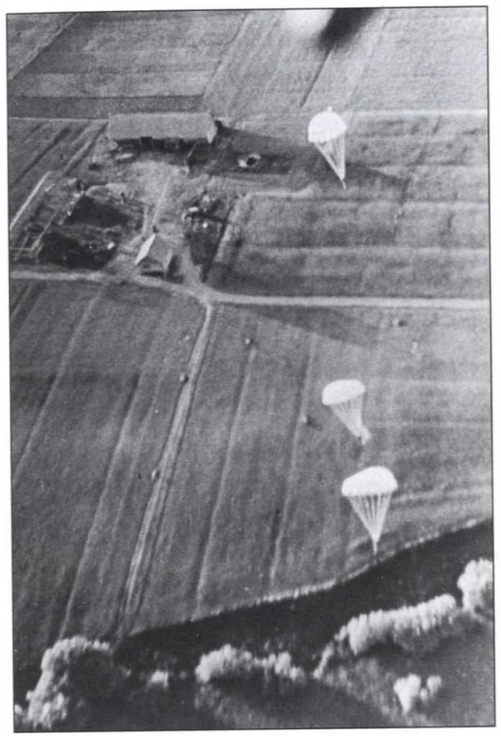
Bf 109 'Friedrich' of JG 53 at a forward airfield in the Leningrad sector on the Eastern Front during the winter of 1941–2.



A snow camouflaged He 111, carrying a 2,200 bomb, on its way to attack a target on the Eastern Front.

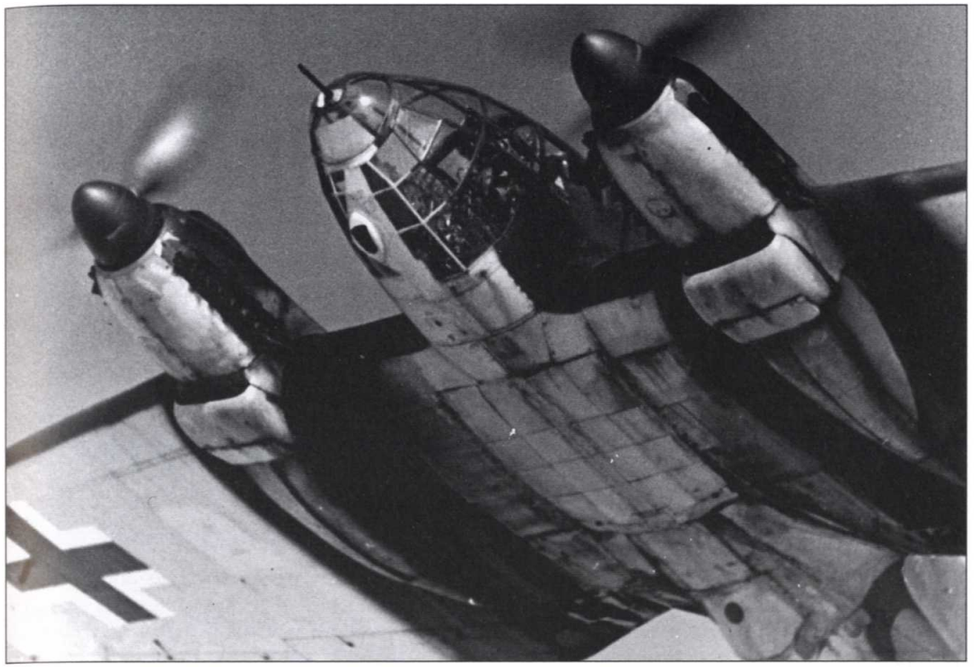


Heading east towards the rising sun soon after first light, a Ju 88 cruises over the still waters of the Black Sea.

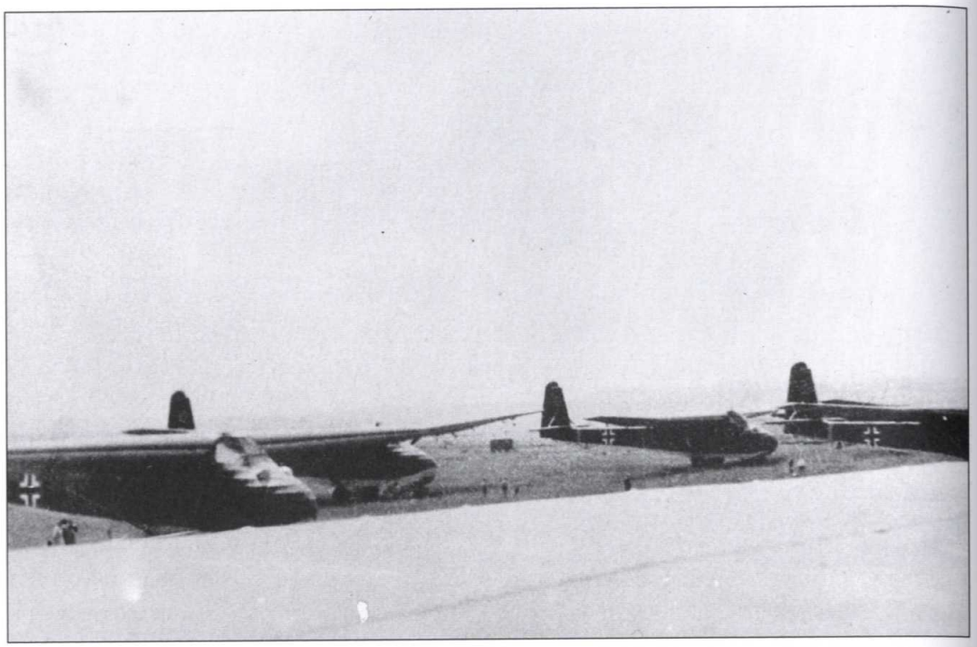


On the Eastern Front the Luftwaffe frequently mounted supply drops, to take fuel and ammunition to the fast-moving Panzer columns to enable them to maintain the momentum of their thrusts.

Supply containers mounted on the underfuselage racks of a He 111.

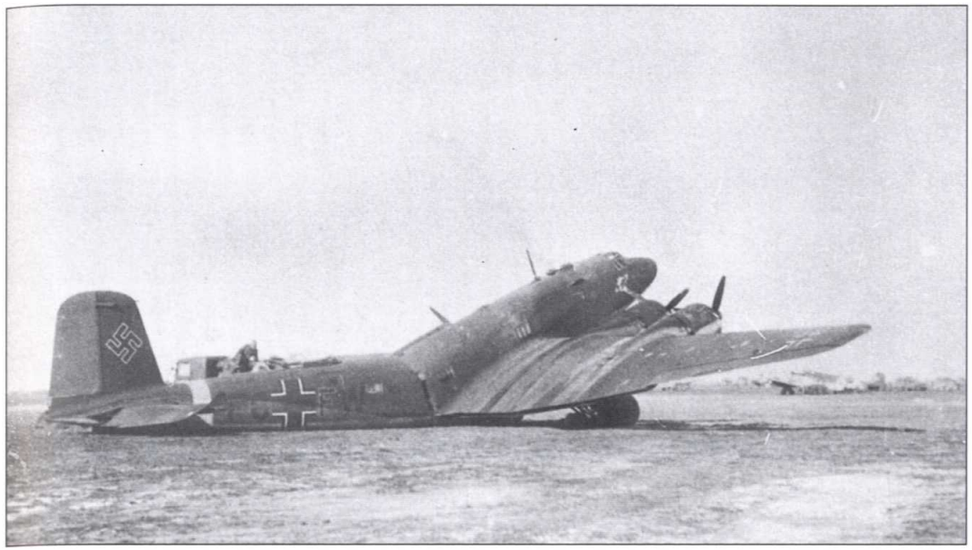


He 111s of KG 100 during operations on the Eastern Front.



The Messerschmitt Me 321 heavy lift glider was originally designed for use during the planned invasion of Great Britain. With 200 examples built, their main use in service was to deliver priority cargoes to forward airfields on the Eastern Front. Initially the glider was towed by three Bf 110s flying in formation, but later the specially-developed Heinkel He 111Z was used for this purpose. via Schliephake

The remarkable Heinkel He 111Z (Zwilling = twin) comprised two He 111 bombers joined by a stub wing on which a fifth engine was mounted. Eight of these unusual 'Siamese twins' were built, and used as tugs for Me 321 heavy lift gliders.



On occasions the Focke Wulf Fw 200 maritime reconnaissance aircraft was pressed into use as a transport. However, the fragile, converted airliner was unable to cope with the uneven surfaces it encountered at some of the forward landing grounds.

Leutnant Leykauf of III./JG 54 with his Bf 109F at Siverskaya, June 1942.

Bf 109G-2 of II./JG 54 operating on the northern sector of the Eastern Front in the late spring of 1942. The thaw that followed each Russian winter produced flooding at many of the forward airfields. This caused severe problems for the flying units. Often aircraft were bogged down in the mud, sometimes suffering damage if they ran into a patch during take-off or landing.

The action around the important naval base at Sevastopol in the Crimea was the focal point of the fighting on the Eastern Front during the spring of 1942.

Major Helmut Bode, commander of III./StG 77, on his way to deliver an attack on a Soviet troop position near the port. Some German dive-bomber units were based at forward landing grounds within 40 km (25 miles) of Sevastopol, and at the height of the action individual crews often flew as many as twelve sorties per day.

Smoke rises from fires started at the port of Sevastopol as a Ju 87 moves into position to commence yet another attack.

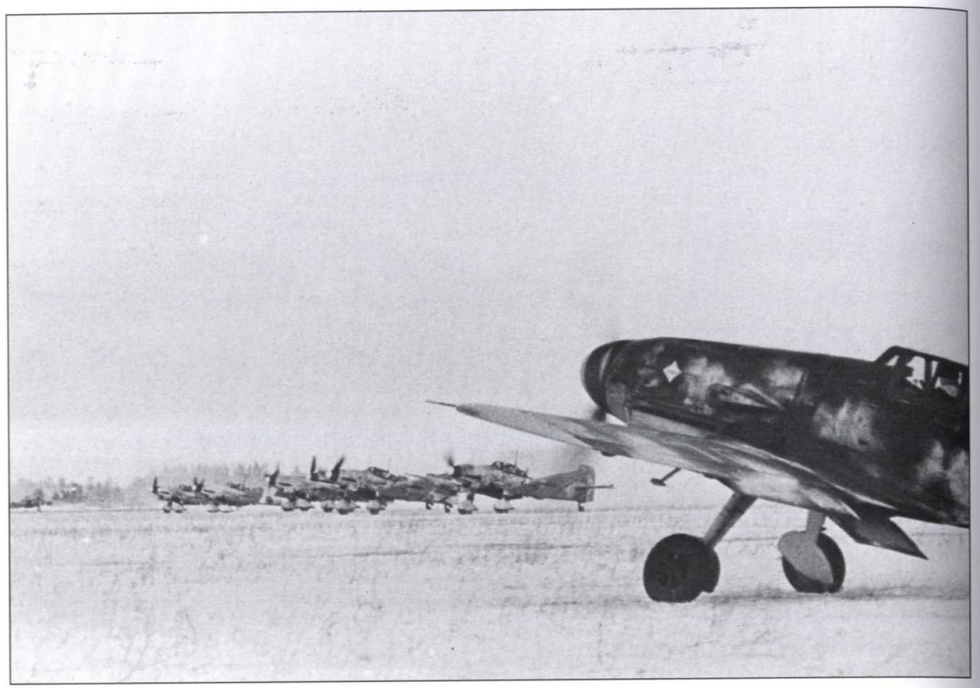
The view over the nose of a Ju 87 during its near vertical attack dive on one of the forts at Sevastopol. Bombs dropped from the aircraft in front are seen exploding on the target.

Bf 109G-2 of JG 77 flown by Oberfeldwebel Hans Pichler (right) during operations on the Leningrad Front in Russia, late summer 1942.

Bf 109E fighter-bomber of II./LG 2 taking off from a field landing ground on the Eastern Front.

THE EASTERN FRONT

OCTOBER 1942 TO MAY 1944



Messerschmitt Bf 109G of Jagdgeschwader 53 (JG 53) warming its engine with Junkers Ju 87D dive-bombers of 1st Staffel of Sturzkampfgeschwader 5 (1./StG 5) before taking off to attack a target in the Leningrad area. Schmidt

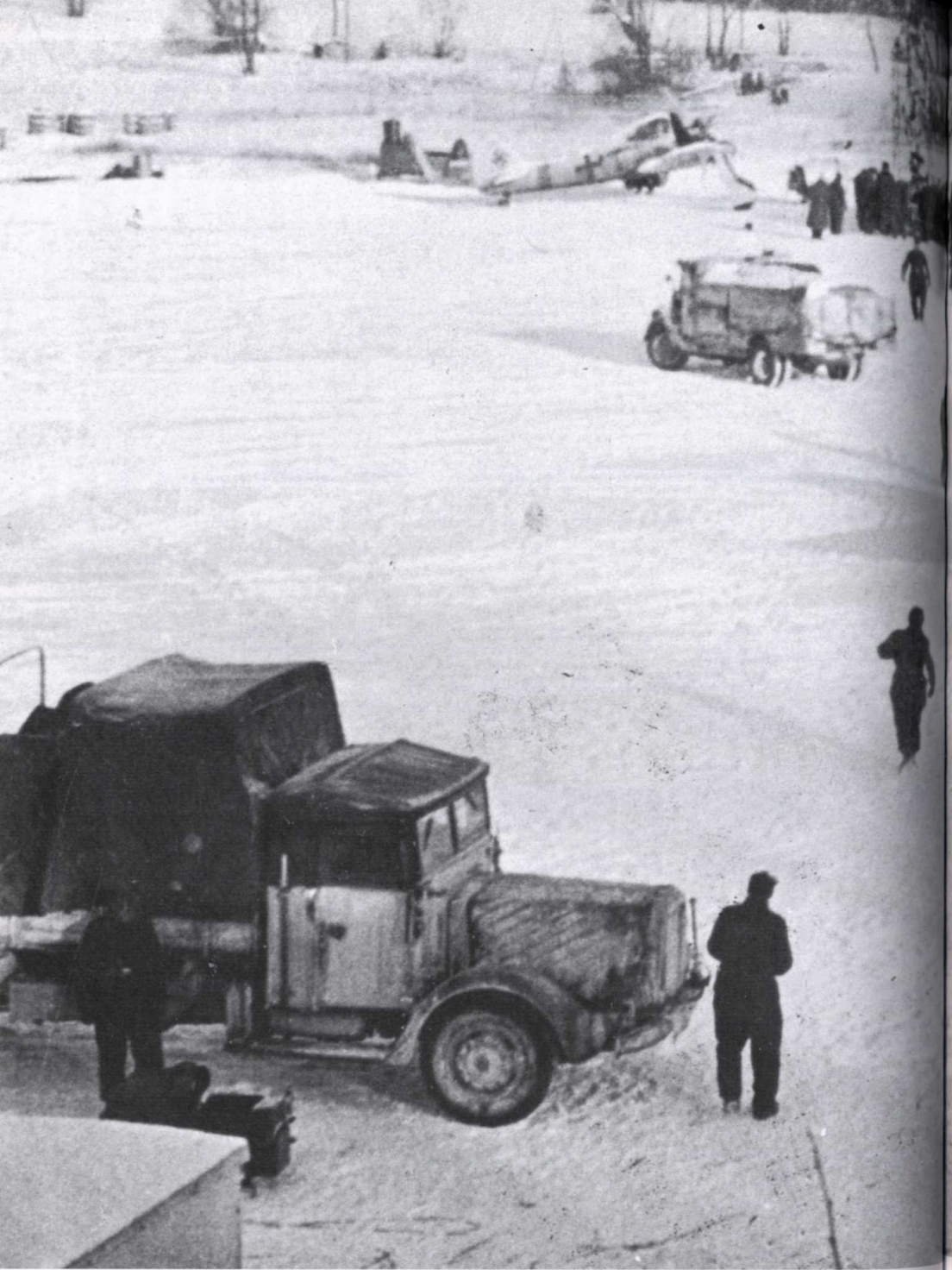
Junkers Ju 87s of 1./StG 5 on their way to a target. Each aircraft carries an AB 250 container for cluster bombs under each wing and under the fuselage. Schmidt

Focke Wulf Fw 190 of Ist Gruppe of JG 51 (I./JG 51), one of the first units on the Eastern Front to operate this fighter.

The Zwerg (dwarf) combustion heater to warm engines prior to start was an important item of ground equipment for operations during the harsh Russian winter.

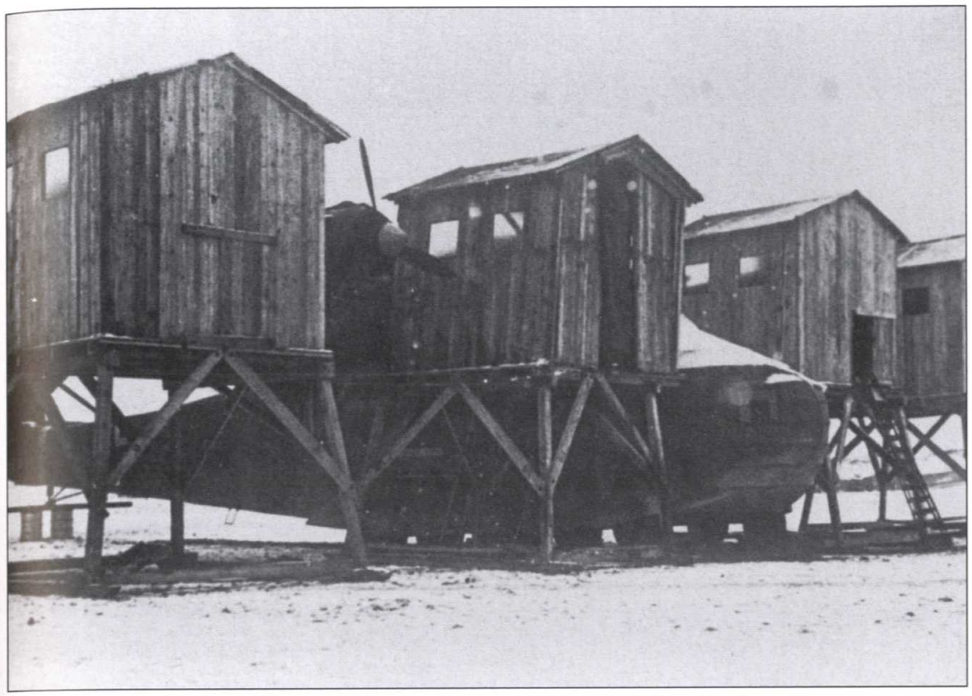
Ground crewmen digging a Junkers Ju 88D reconnaissance aircraft out of a snowdrift, before a sortie. via Schliephake

Snow camouflaged Henschel Hs 129 ground attack aircraft. via Ethell



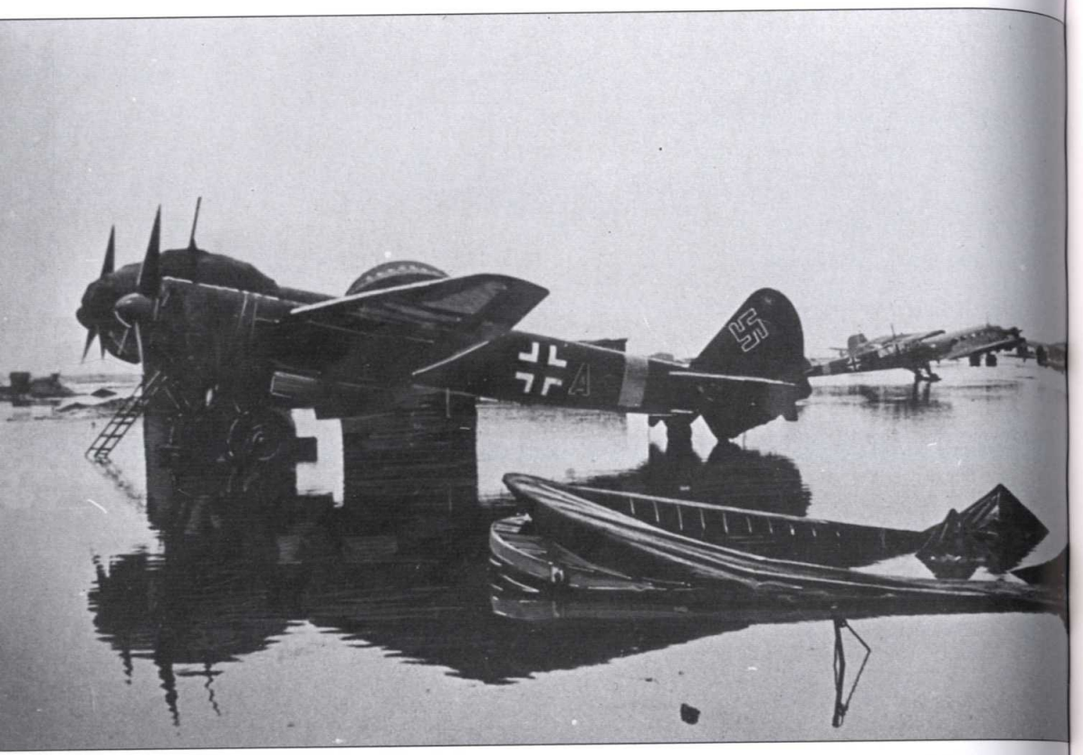
Focke Wulf Fw 190 fighters of III./JG 51 pictured at a forward airfield near Velikiye Luki in Russia early in 1943. The aircraft in the background is in the process of having an engine change, in the open. Rehm

Unloading an 88-mm anti-aircraft/anti-tank gun from an Me 323 on the eastern front. via Michulec

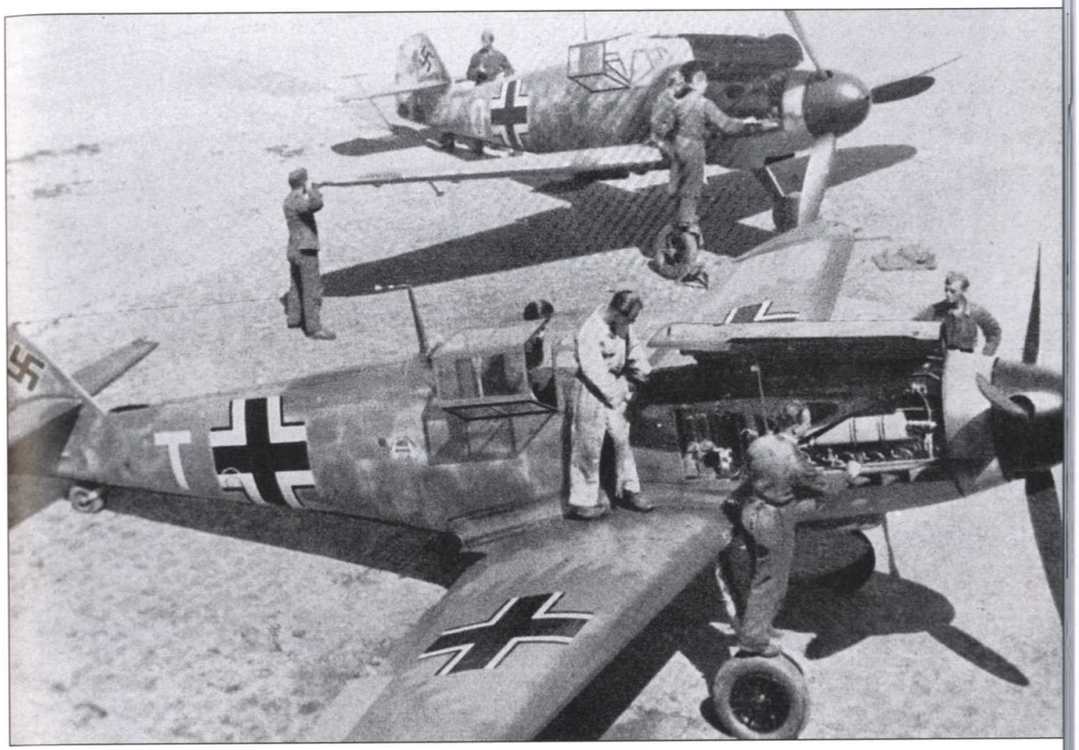


Engine servicing huts mounted on stilts, used to provide protection for ground crewmen working on the engines of the Me 323 during the harsh Russian winter. via Michulec

Focke Wulf Fw 200 maritime patrol aircraft of KG 40 pressed into use as a transporter during the airlift to Stalingrad in the winter of 1942. via Michulec



After each Russian winter came the spring thaw, a period which imposed a new set of difficulties for those attempting to conduct air operations.

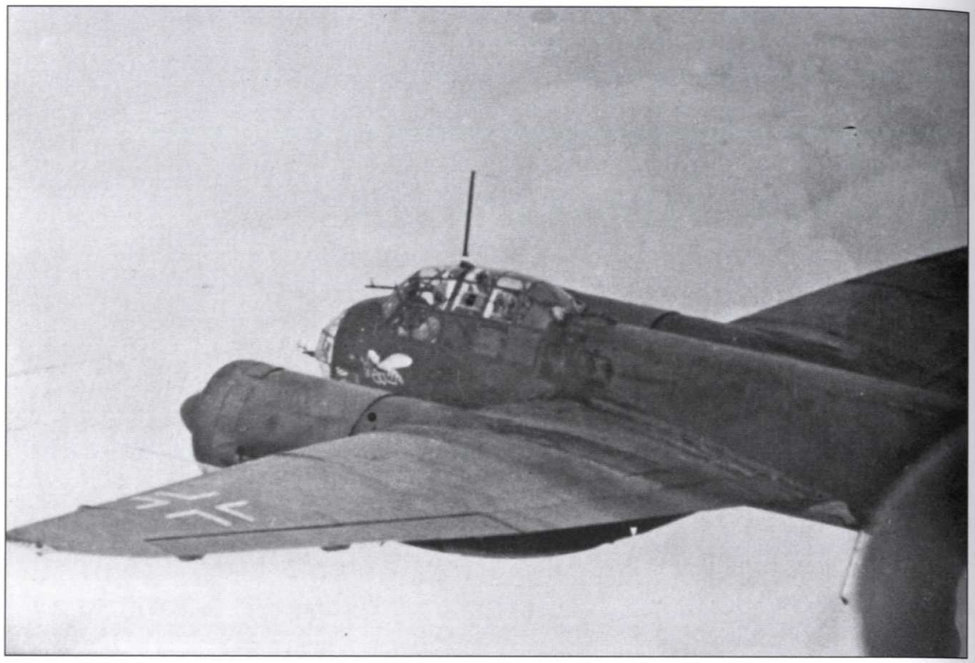


Pair of Bf 109G-2s belonging to a tactical reconnaissance Gruppe. This variant had the nose-mounted cannon removed and carried a vertical camera fitted in the fuselage immediately behind the cockpit. As the Luftwaffe lost air superiority on one front after another, its low-performance army co-operation aircraft were no longer able to operate effectively.

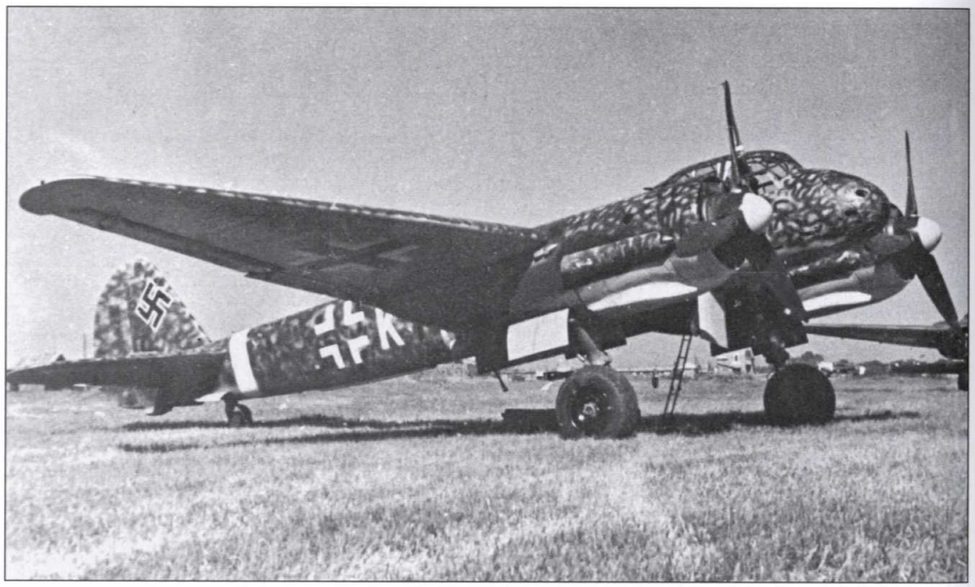
Ju 88s of KG 3 at a forward airfield in Russia. Schultz

Photos taken on the Eastern Front by men of KG 76, a unit flying Ju 88 bombers. (*Above*) Aircraft on the landing approach.

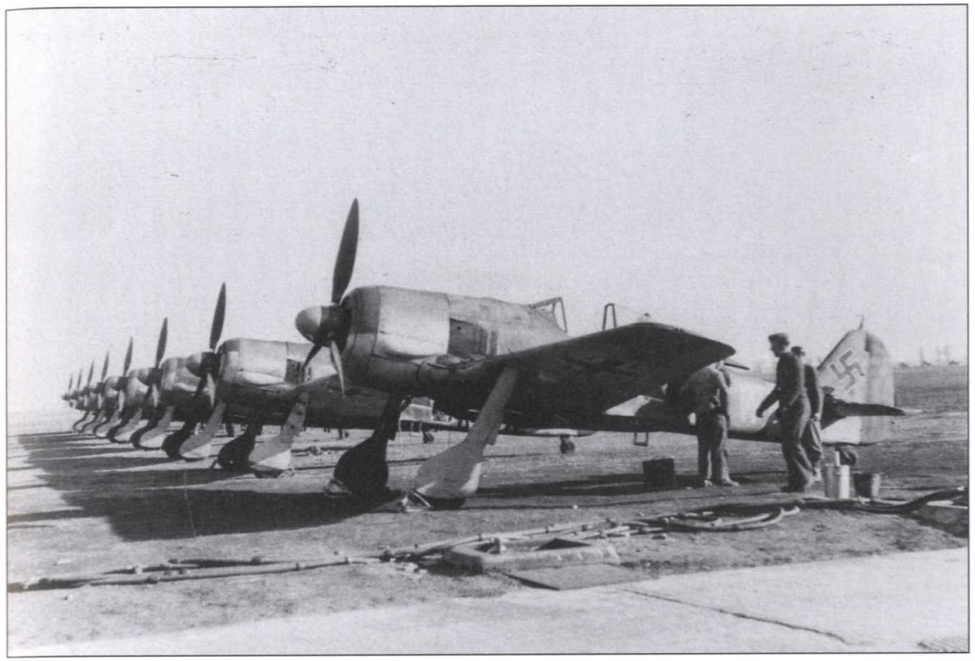
Aircraft of IIIrd Gruppe wearing the unit's emblem, the rampant lion on the coat of arms of the city of Heidelberg.



Aircraft of the Staff Flight of IIIrd Gruppe on its way to attack a target. Note the unit's hornet marking on the nose.



A Ju 88C long-range fighter operated by the unit. These aircraft were often employed in strafing attacks on road and rail traffic. Lukesch aircraft flown by Germany's Allies on the Eastern Front relied on her for modern machines.



Fw 190F fighter-bombers, believed to belong to SKG 10, photographed at Deplin-Irena in Poland where these units underwent live weapons training before going into action. via Heise

Ju 88 of the Finnish Air Force.

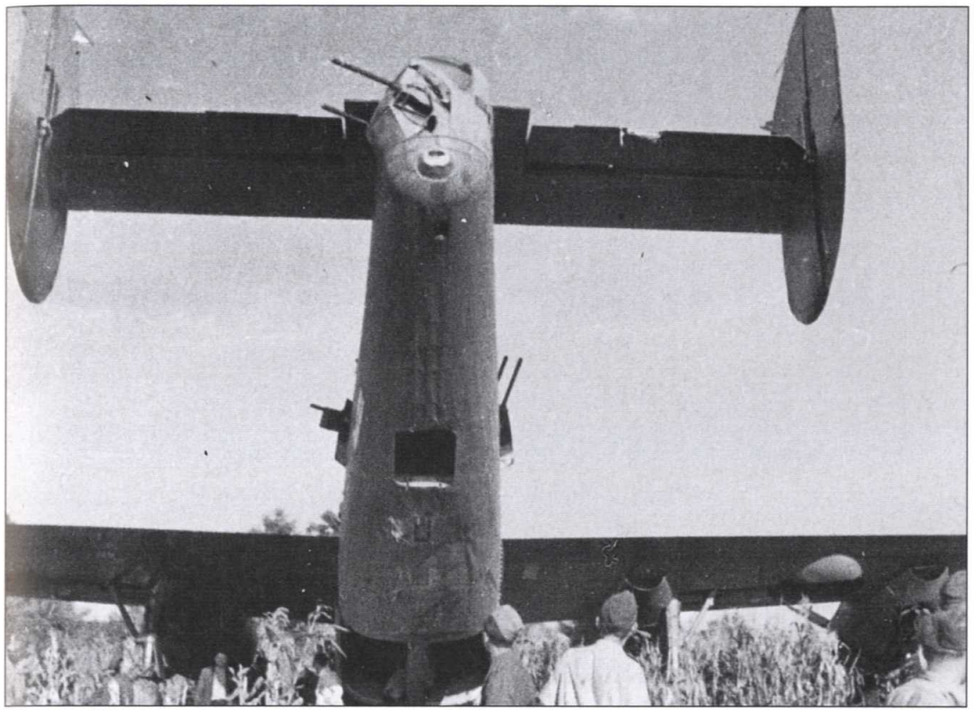
Bf 109G of the Finnish Air Force.

Bf 109Gs of the Rumanian Air Force.

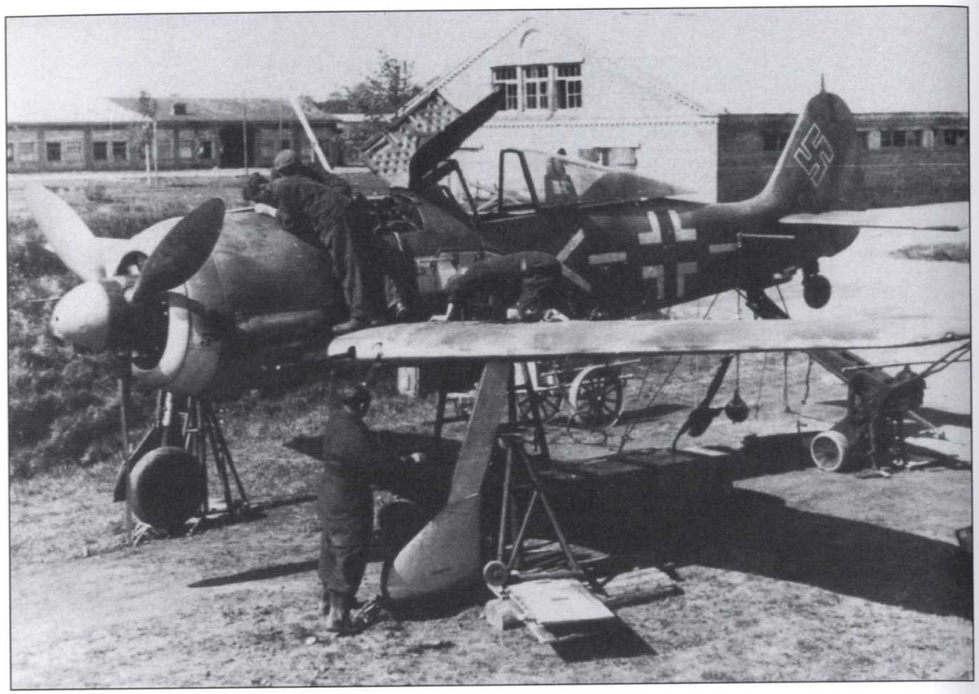
Messerschmitt Me 210 built under licence in Hungary, serving with that nation's air force. The Me 210 had been rejected by the Luftwaffe due to its poor handling characteristics, and production in Hungary ended after 267 planes had been built.

On 1 August 1943 the USAAF sent a force of 177 B-24 Liberators to deliver an epic low altitude attack on the important oil refineries at Ploesti in Rumania. The raiders inflicted heavy damage at some of the refineries, but fifty-six aircraft were lost. Fires blazing at one of the oil refineries, after the raid.

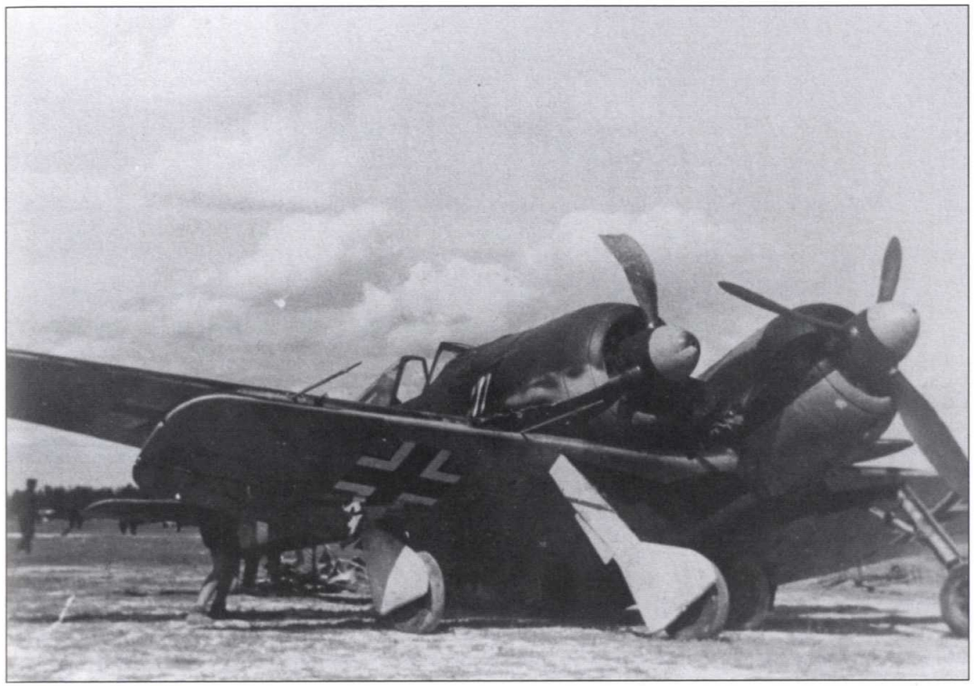
A Bf 109G of JG 4, one of the units responsible for the defence of the refineries.



Luftwaffe personnel examine one of the B-24 Liberators shot down near Ploesti.



Fw 190 fighters of JG 51 pictured on the central front during the decisive Battle of Kursk in July 1943. via Michulec



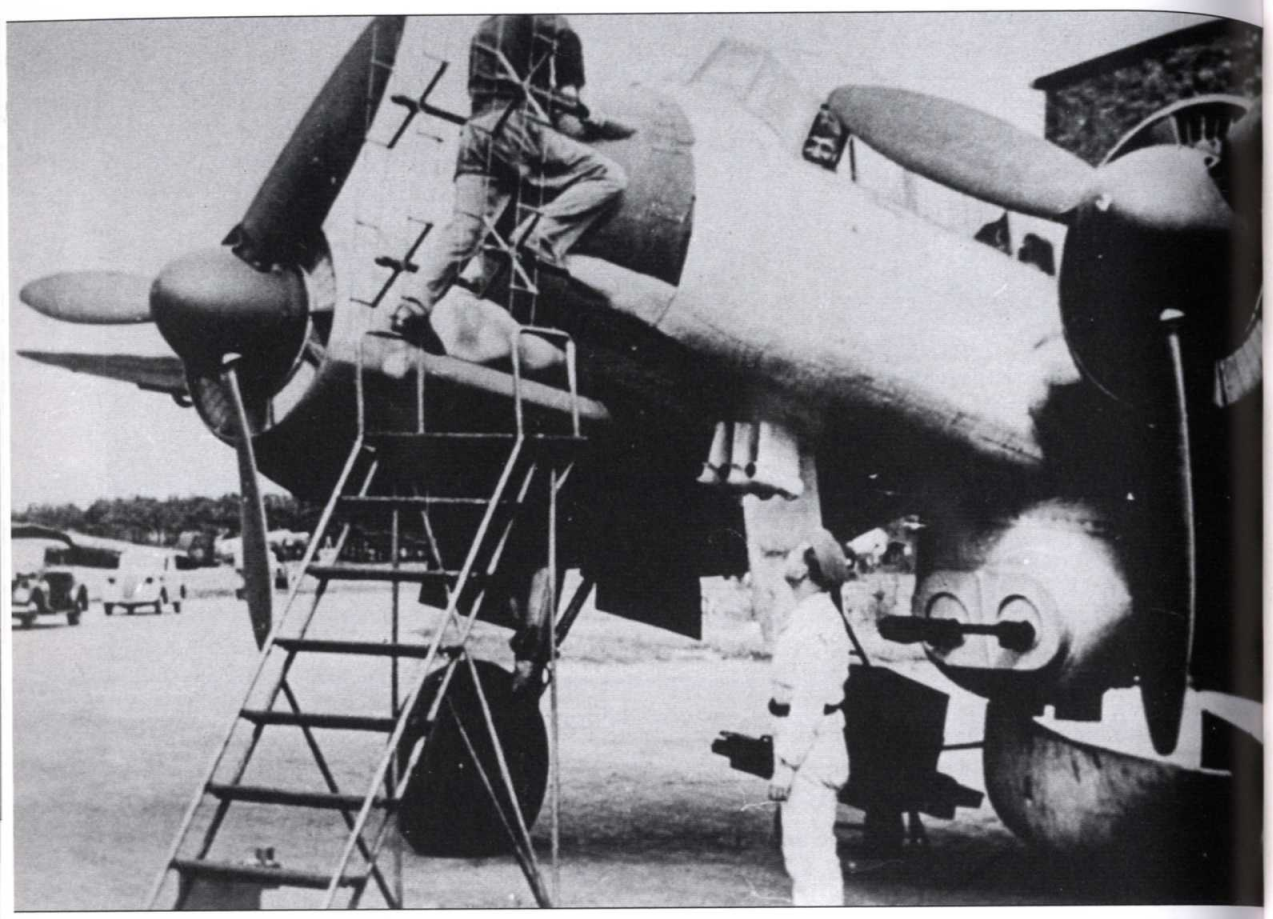
At the congested forward airfields in Russia collision was an ever-present risk, especially during periods of intensive operations. Here an Fw 190 of JG 51 had run into another aircraft of the same unit. via Michulec

This Hs 129 ground attack aircraft collided with a Bf 109 fighter, wrecking both aircraft.

Junkers Ju 87D dive-bombers of 1./StG 2 about to take off for a mission over Russia. At the controls of the leading aircraft was the dive-bomber ace Oberleutnant Hans-Ulrich Rudel. Note the fuse extensions fitted to the bombs on the underwing racks, to detonate the weapons just above ground level.

Engine change on a Ju 87D in the field.

During the latter part of the war the night attack units, Nachtschlachtgruppen, were an important part of the Luftwaffe ground attack forces on the eastern and southern fronts. Operating slow-flying biplanes with open cockpits, these units patrolled enemy rear areas at night and attacked any sign of movement using machine guns and small bombs. Some of the aircraft used were foreign types. These Fokker CV aircraft (*above*) operated by NSGr 11 were of Dutch pre-war design, built under licence in Denmark and seized when that country was overrun in 1940. The Italian-built Fiat Cr 42 biplane fighters (*below*) belonged to 1./NSGr 7. via Petrick

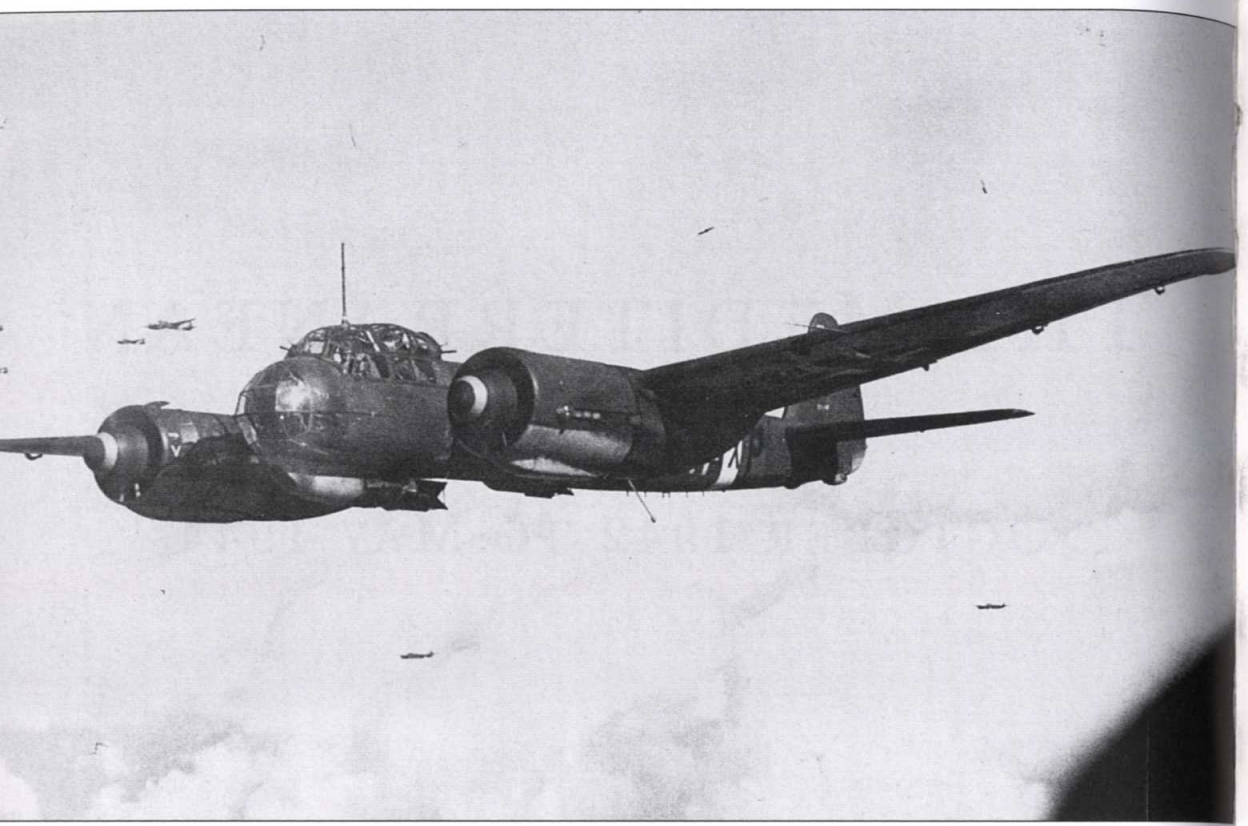


Ju 88 night-fighter serving with Nachtjagdgeschwader 100 (NJG 100) on the Eastern Front. Radar control facilities in the area were sparse so electronic identification was unreliable. This aircraft carried three organ pipes mounted below the forward fuselage, which produced a distinctive note in flight and served to identify it as a friendly aircraft to German AA gunners.

Heinkel He 177 experimentally fitted with a 7.5-cm gun, intended for operations against ground targets on the Eastern Front. The combination was not a success, however, and it was not used in action.

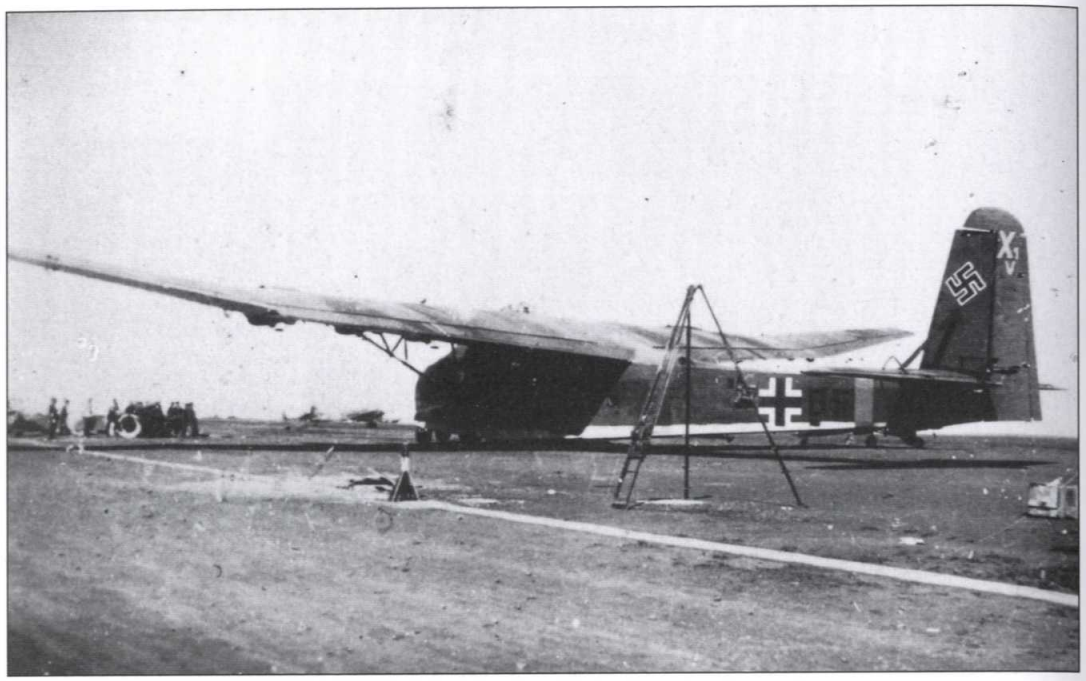
The Mediterranean Front

October 1942 to May 1944

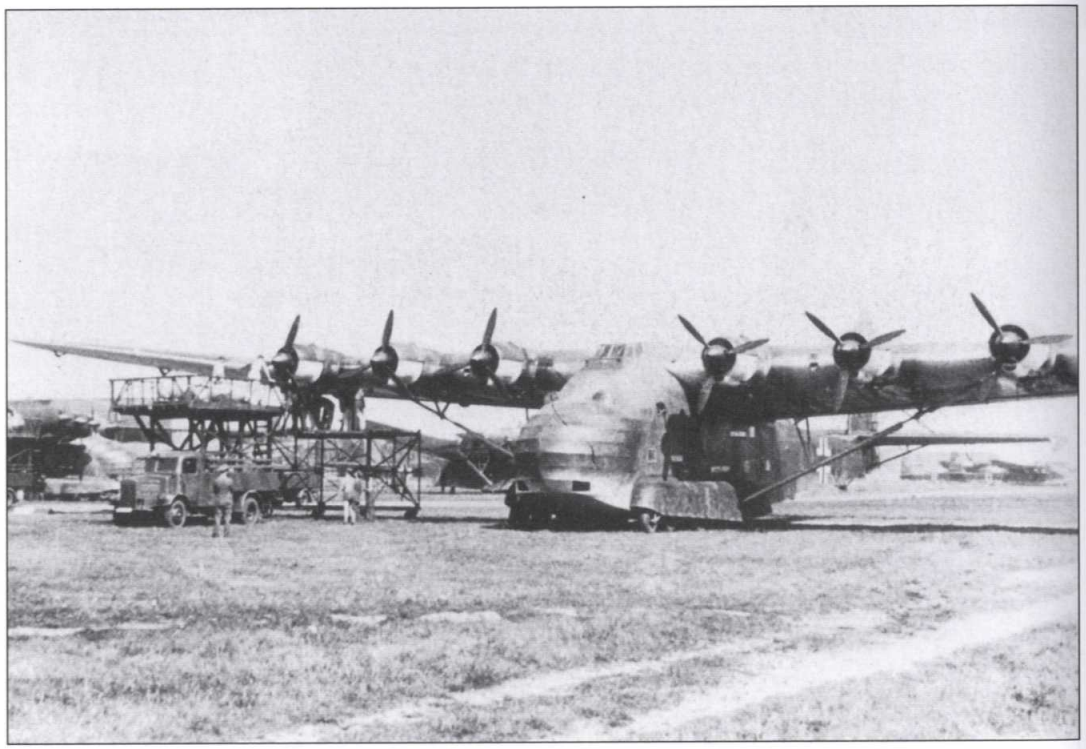


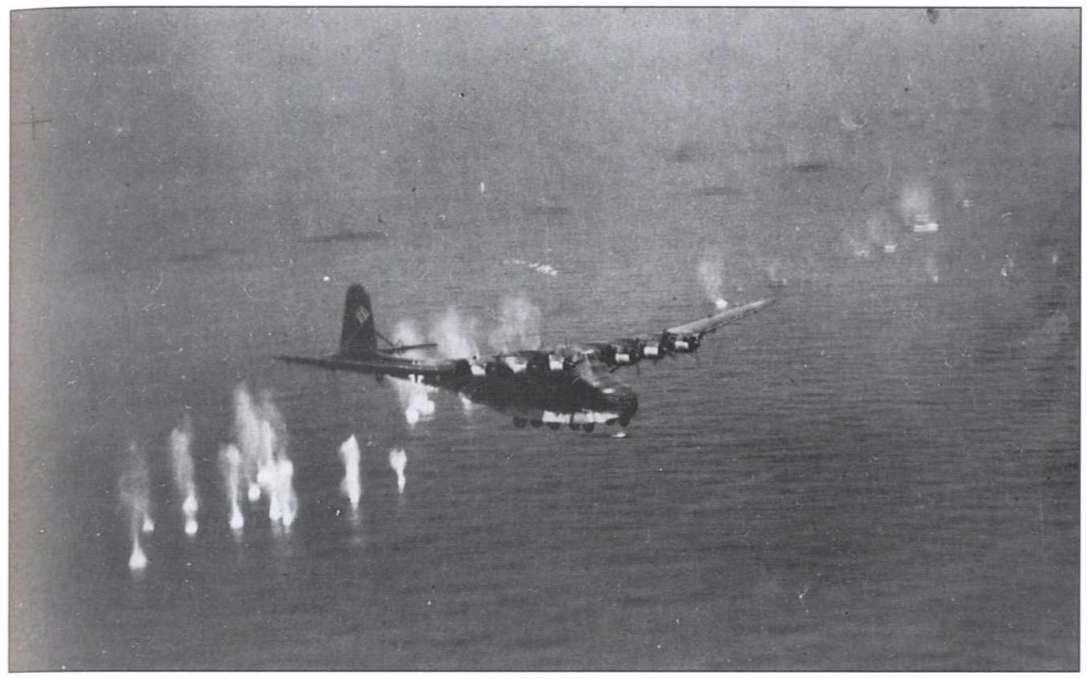
Ju 88s of KG 54 on route from Catania, Sicily, to attack Benghazi in Libya in the autumn of 1942 following its capture by British and Commonwealth forces. via Schliephake

Bf 109Gs of JG 27 operating in the Mediterranean theatre.

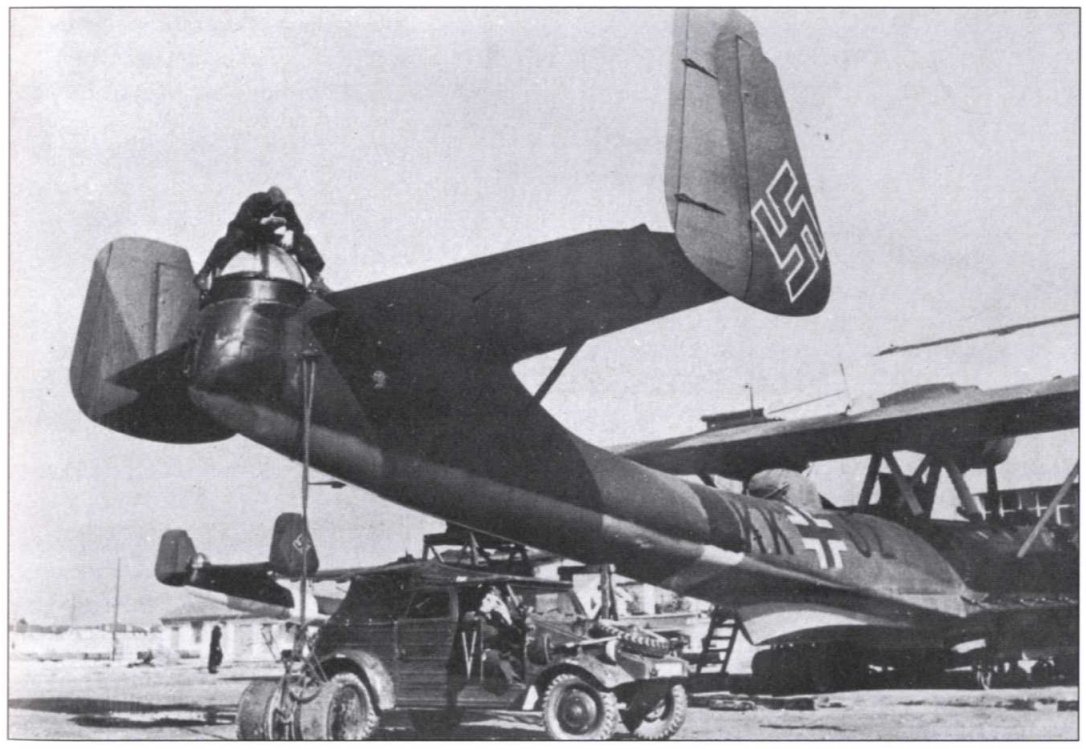


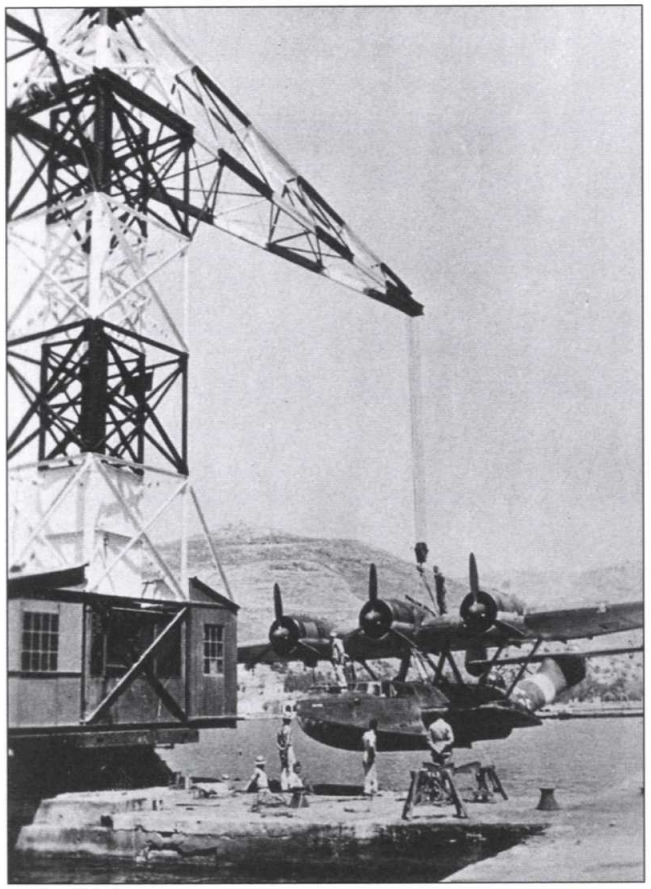
Messerschmitt Me 323 heavy transport of Transportgeschwader 5 (TG 5) played an important role in the airlift to move troops and equipment to Tunisia from the autumn of 1942 to the spring of 1943.



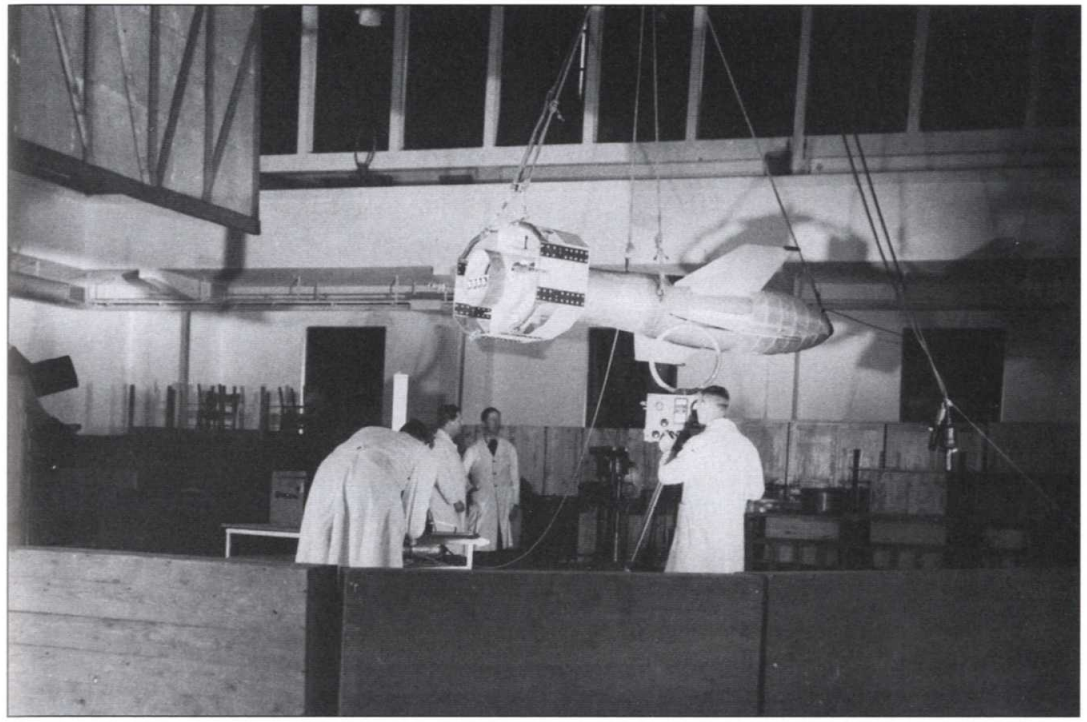


The Allied air and sea blockade of Tunisia took a steady toll of supplies and reinforcements coming in from Sicily and Italy. Here a low-flying Me 323 is pictured under attack from Allied fighters over the Mediterranean.



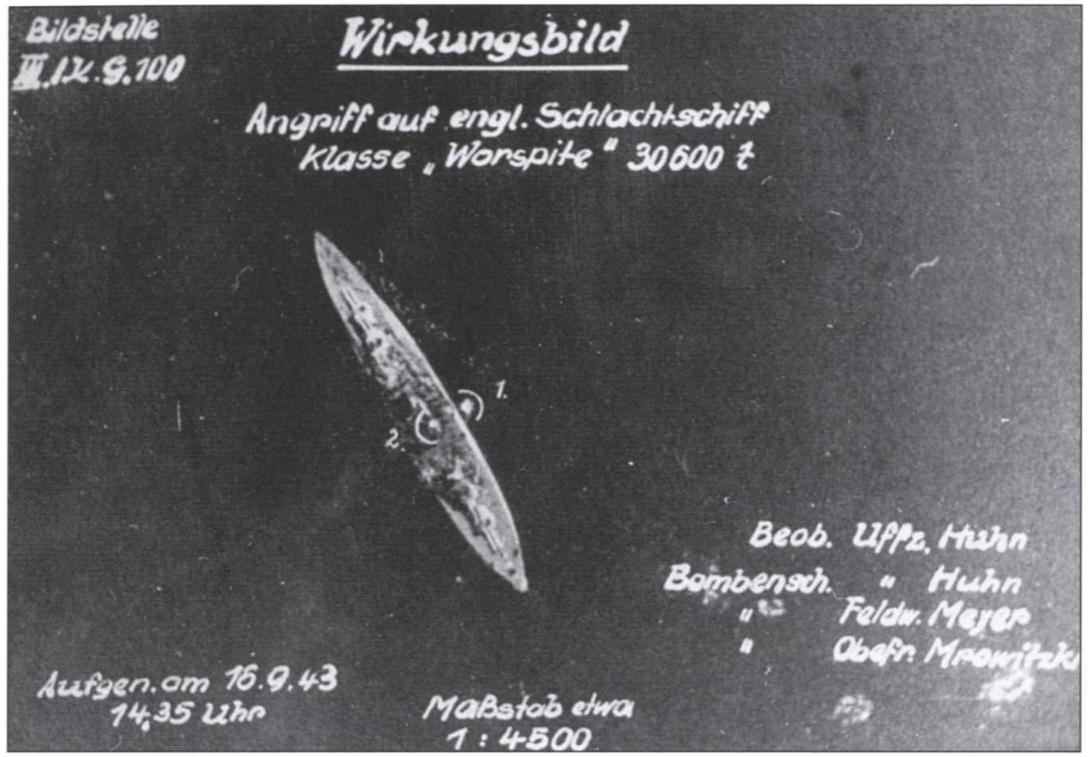


Dornier Do 24 flying boats (*left, above and below*) operating with air sea rescue units played an important role in the Mediterranean theatre, where they picked up survivors from both sides. via Michulec

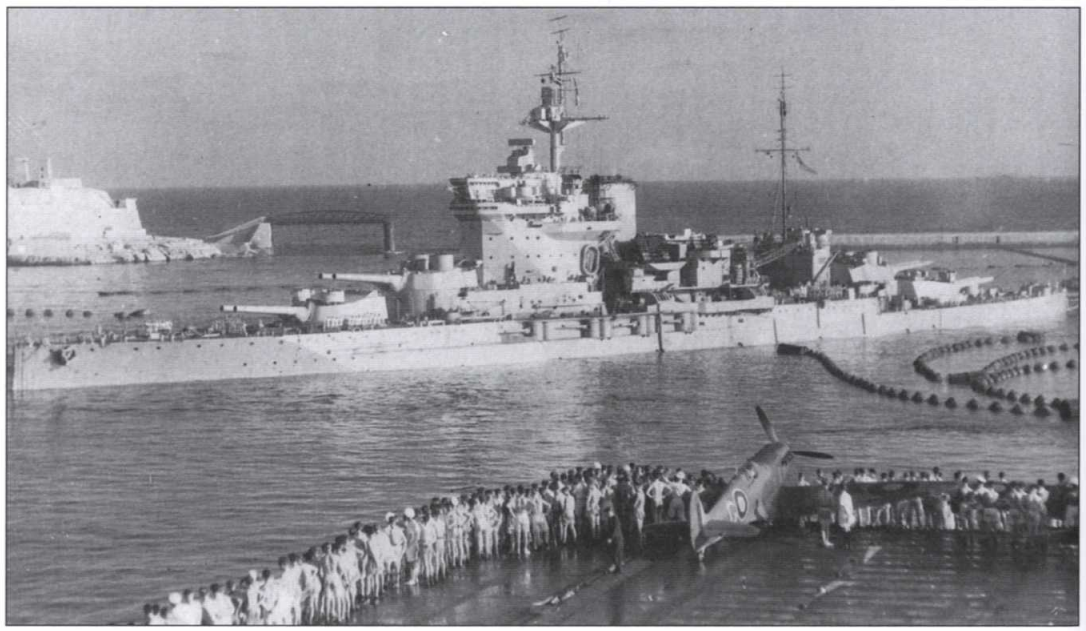


A Fritz X radio guided armour-piercing bomb, weighing 3,090 lb, undergoing testing in a laboratory. Released from altitudes around 20,000 feet, the unpowered weapon achieved impact velocities sufficient to penetrate the deck armour of heavy cruisers or battleships. via Trenkle

Dornier Do 217K-2s of III./KG 100. This variant, modified to carry the Fritz X, had the wing extended by just over 18 feet to provide the additional area to enable it to carry the weapon to the required release altitude. Jope

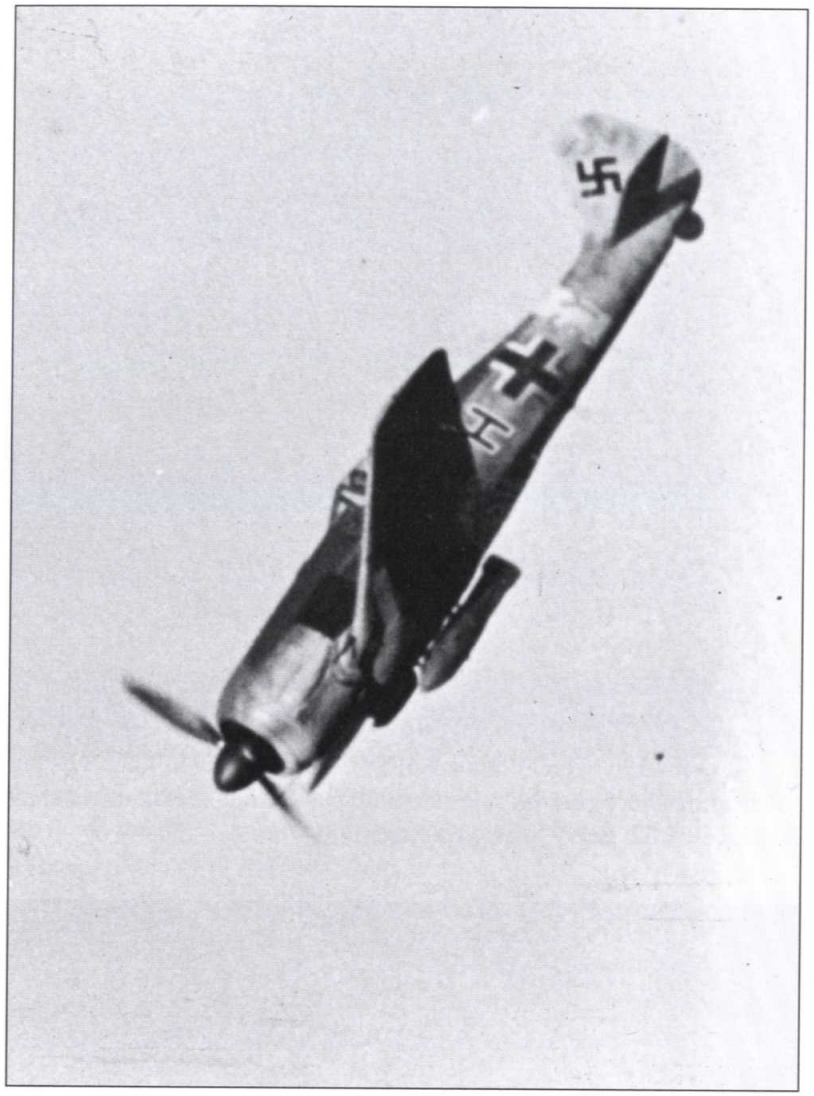


Bomb sight photograph showing HMS *Warspite* under attack from two Fritz X weapons on 16 September 1943. At the time the battleship was moving inshore, to provide gunfire support for Allied troops landing at Salerno in Italy. via Jope



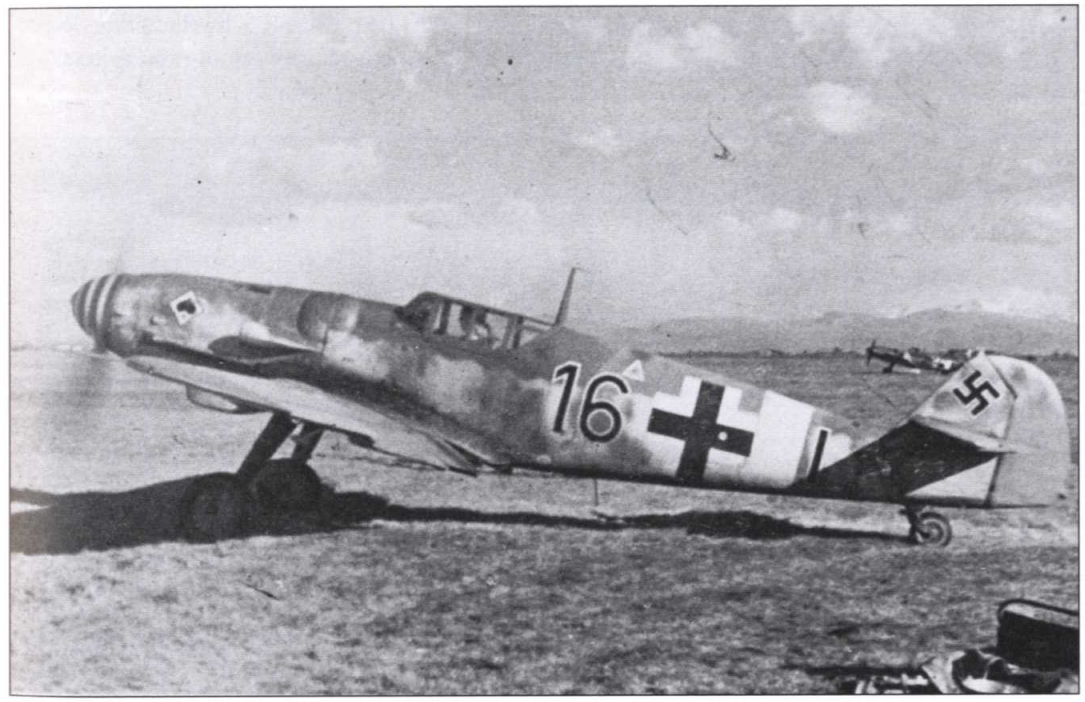
Hit by three Fritz X missiles, *Warspite* suffered severe damage. One of the weapons penetrated six decks to explode on, and blow a hole through, her double bottom. The battleship took on 5,000 tons of water and, with her freeboard lowered as seen here, she was towed to Malta for makeshift repairs.

Three photographs of Fw 190 fighter-bombers of SKG 10 operating in Italy. The unit was heavily committed in delivering attacks on the Allied amphibious landing areas, and operating in the face of strong defences it suffered heavy losses. via Rigelsford



Fw 190 in a steep dive attack, carrying a SC500 (1,100 lb) bomb.

Ju 88 of III./KG 76. This unit operated over Italy during the summer and autumn of 1943. The aircraft is pictured crossing the Alps in December, when the unit moved to Varelbusch in western Germany during the assembly of forces for the attack on England in January 1944. Lukesch

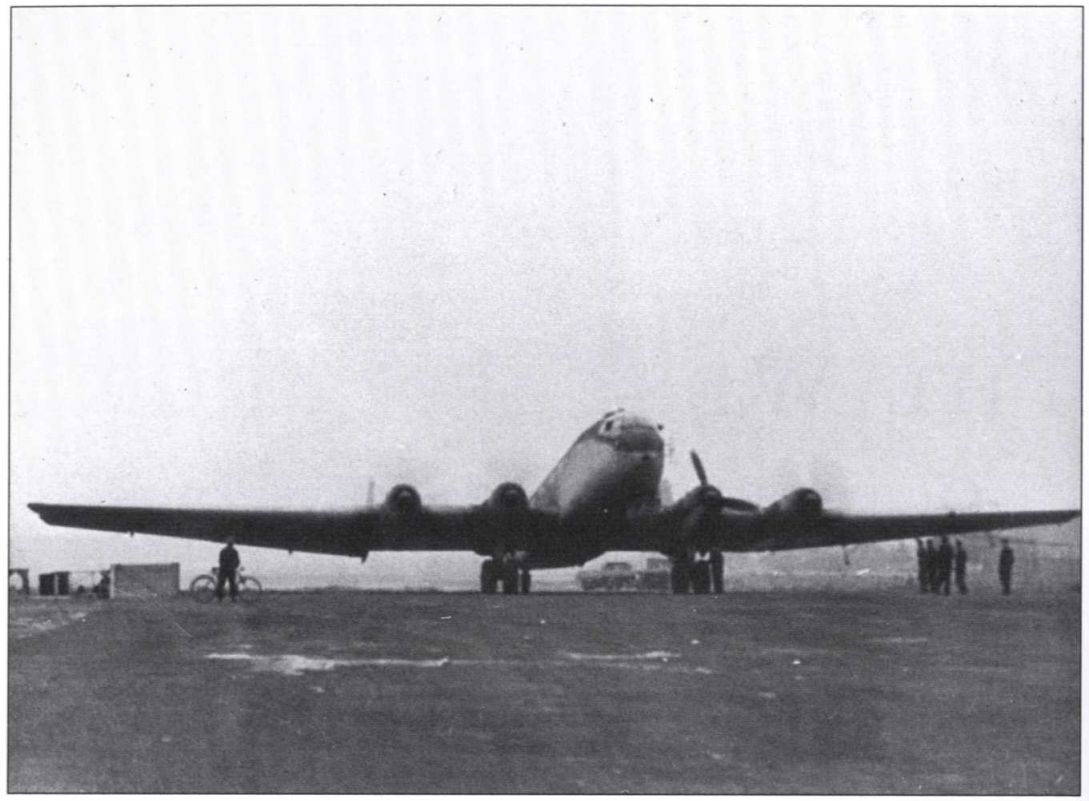


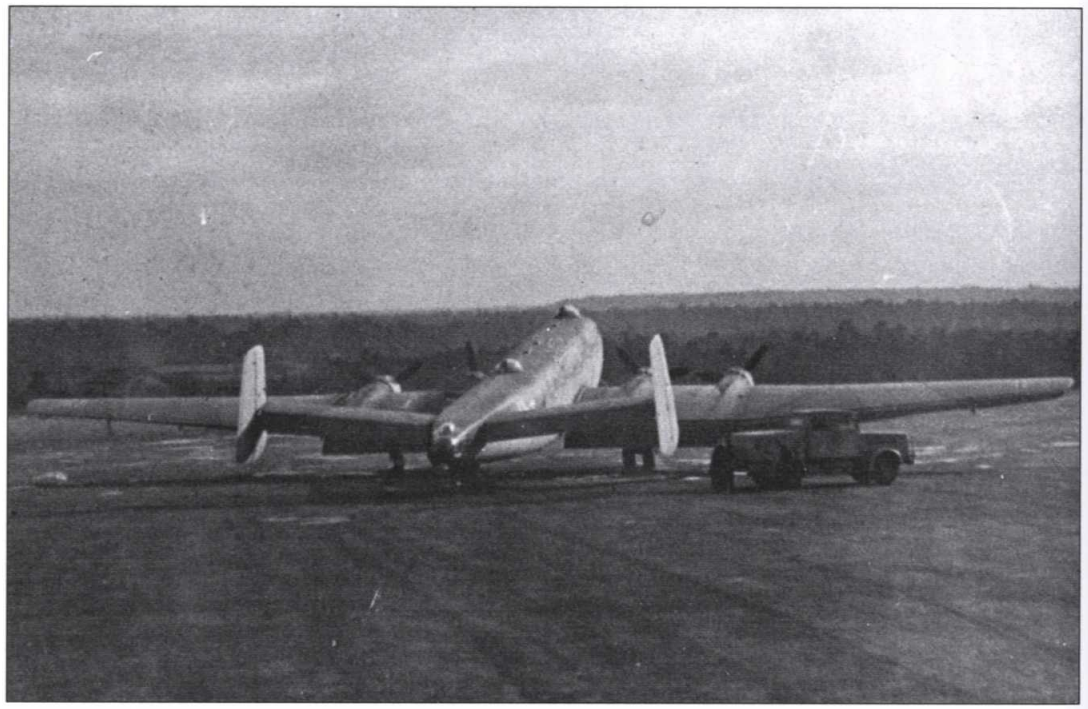
Bf 109G of III./JG 53, part of the outnumbered German fighter force that fought over Italy. via Rigelsford

As German forces made a fighting withdrawal up the length of Italy, they carried out a systematic destruction of the infrastructure to leave as little as possible that would be of military value to the enemy. The powerful Schwellenpflug device made short work of railway tracks. via Rigelsford

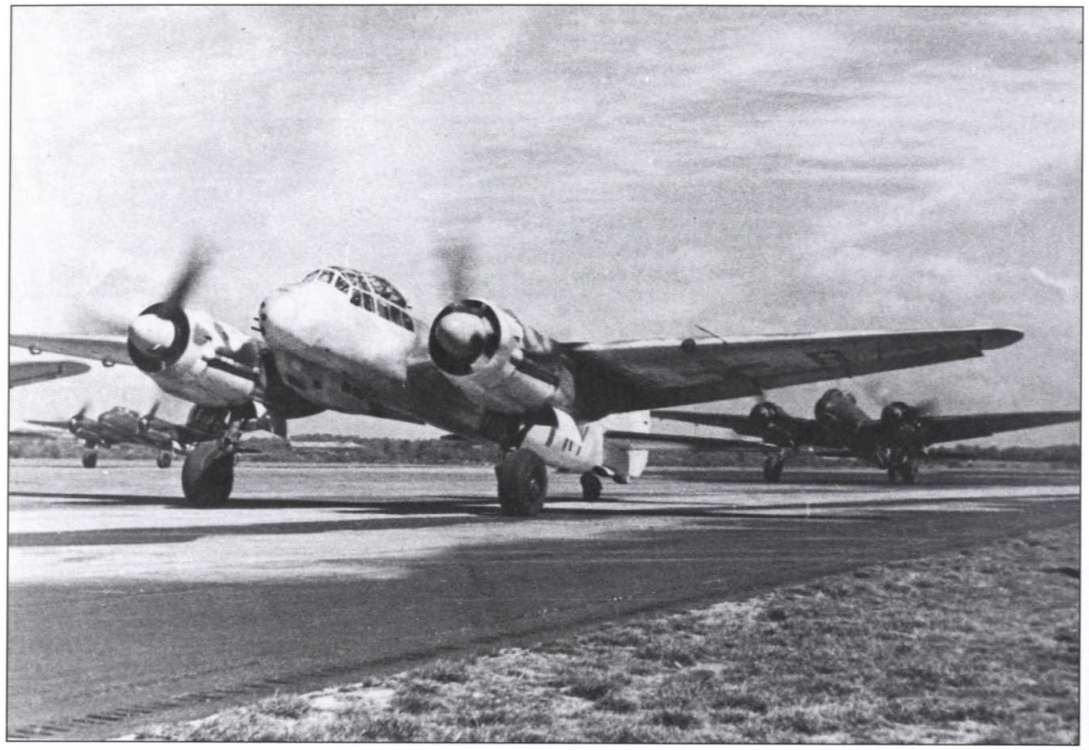
THE WESTERN FRONT

OCTOBER 1942 TO MAY 1944





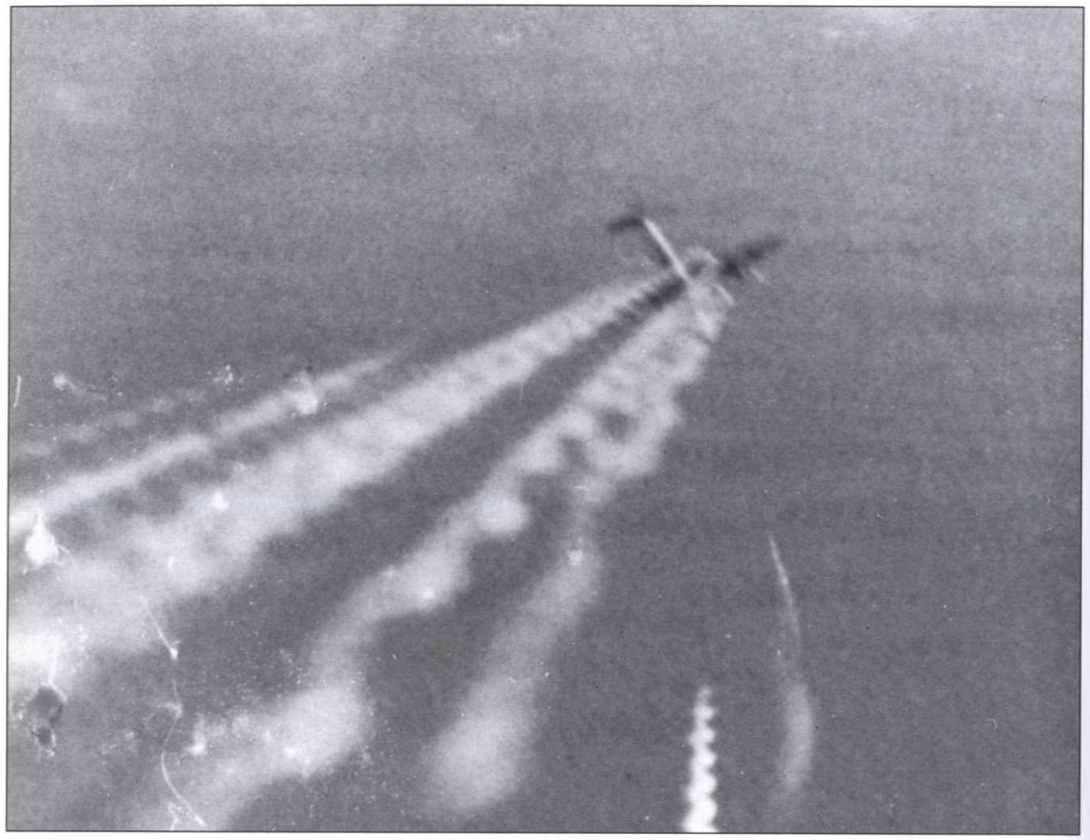
Radar-fitted Junkers Ju 290 long-range reconnaissance aircraft flown by Fernaufklärungsgruppe 5 (FAG 5) operating from Mont de Marsan in south-west France. This unit flew reconnaissance missions far into the Atlantic, searching for convoys for U-boats to attack. via Obert



Junkers Ju 88C long-range fighters of V./KG 40, a unit tasked with providing protection for U-boats passing through the Bay of Biscay to reach their hunting ground in the Atlantic. A four-aircraft Schwarm of Ju 88s lined up before take-off from their base at Bordeaux/Merignac.

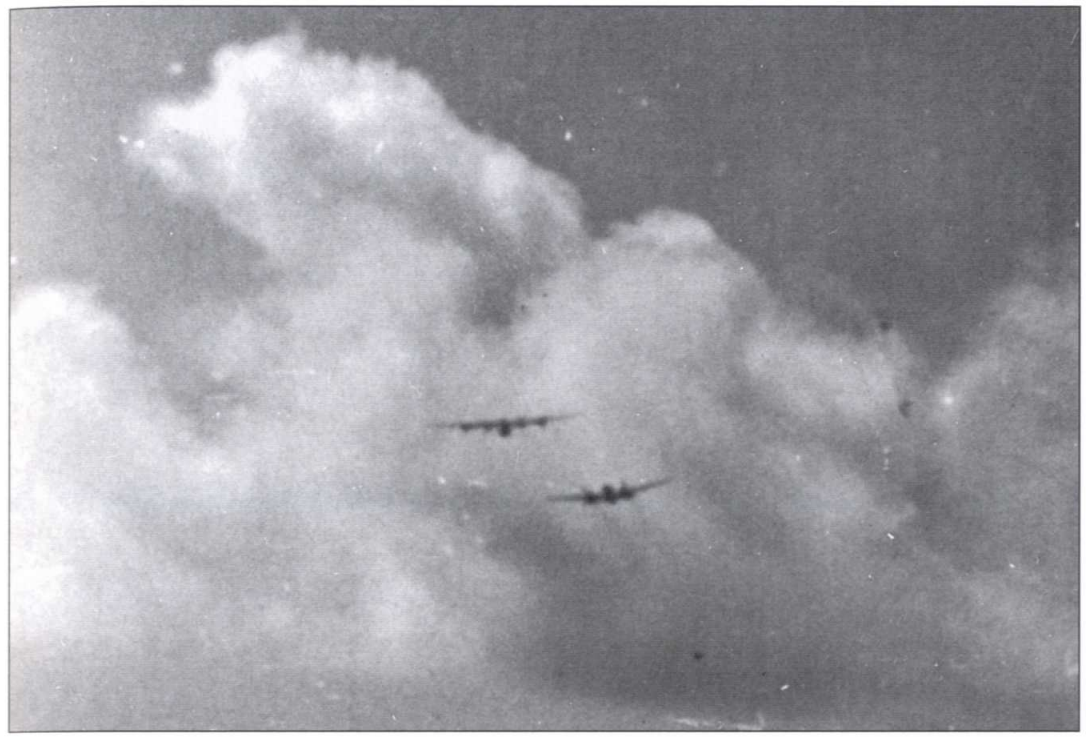
Ju 88Cs head out to sea.

U-boats in the Bay of Biscay area were often the subject of attacks by Allied aircraft, making the presence of the German heavy fighters in their area extremely welcome.

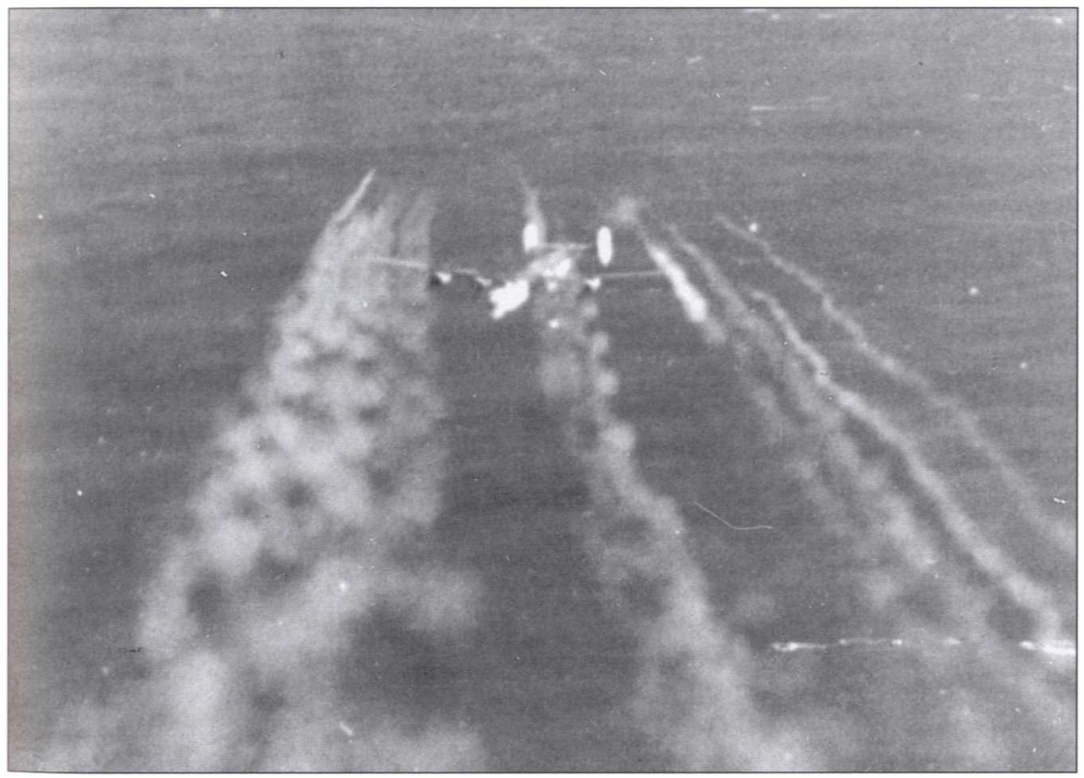


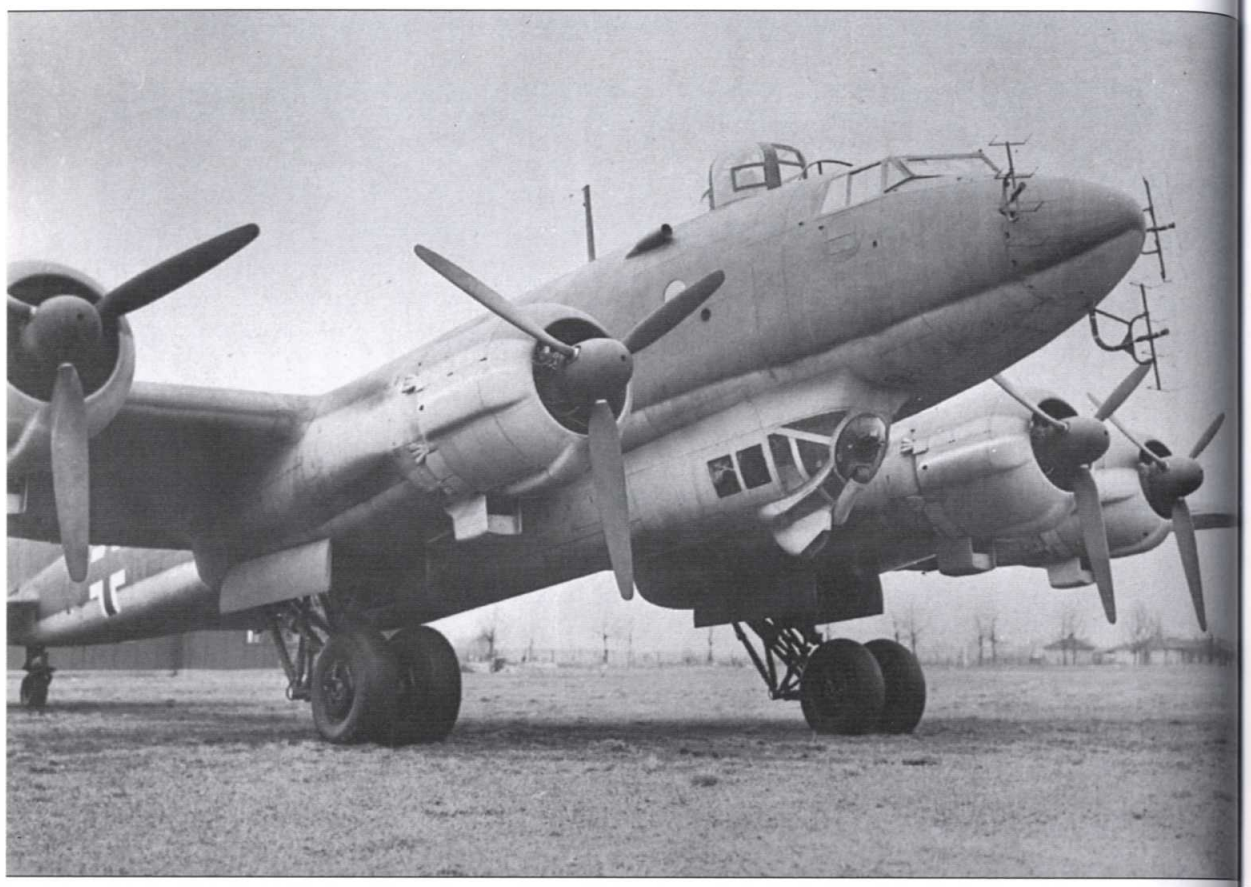
Dramatic shots taken from Ju 88Cs during actions against RAF aircraft over the Bay of Biscay: tracer rounds streaking towards an RAF Sunderland flying boat under attack.

The Sunderland was forced down on the water. Sinking and with one wing awash, the crew inflate dinghies and prepare to abandon the aircraft.

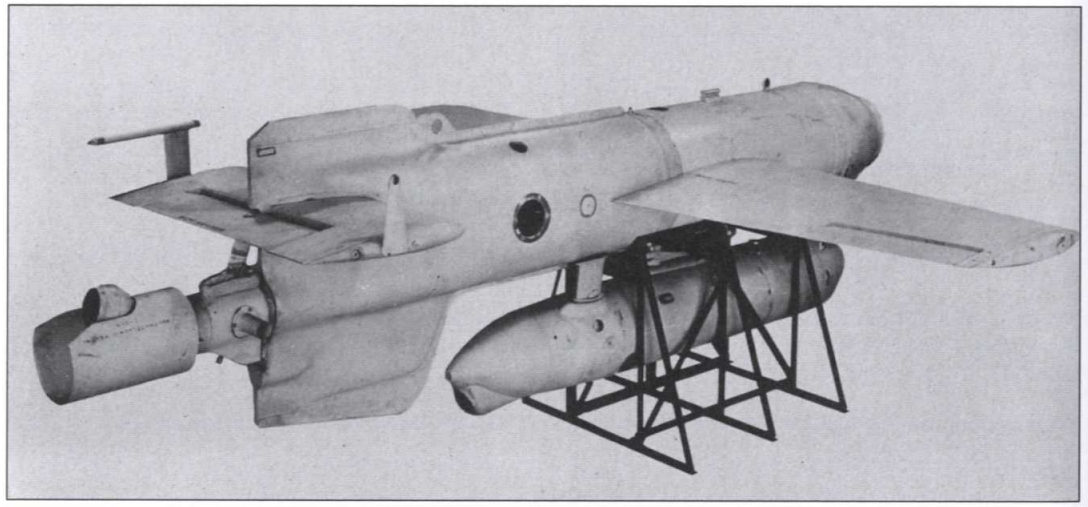


Coastal Command Liberator under attack from Ju 88s. The well-armed four-engined aircraft often proved a doughty opponent during these encounters.

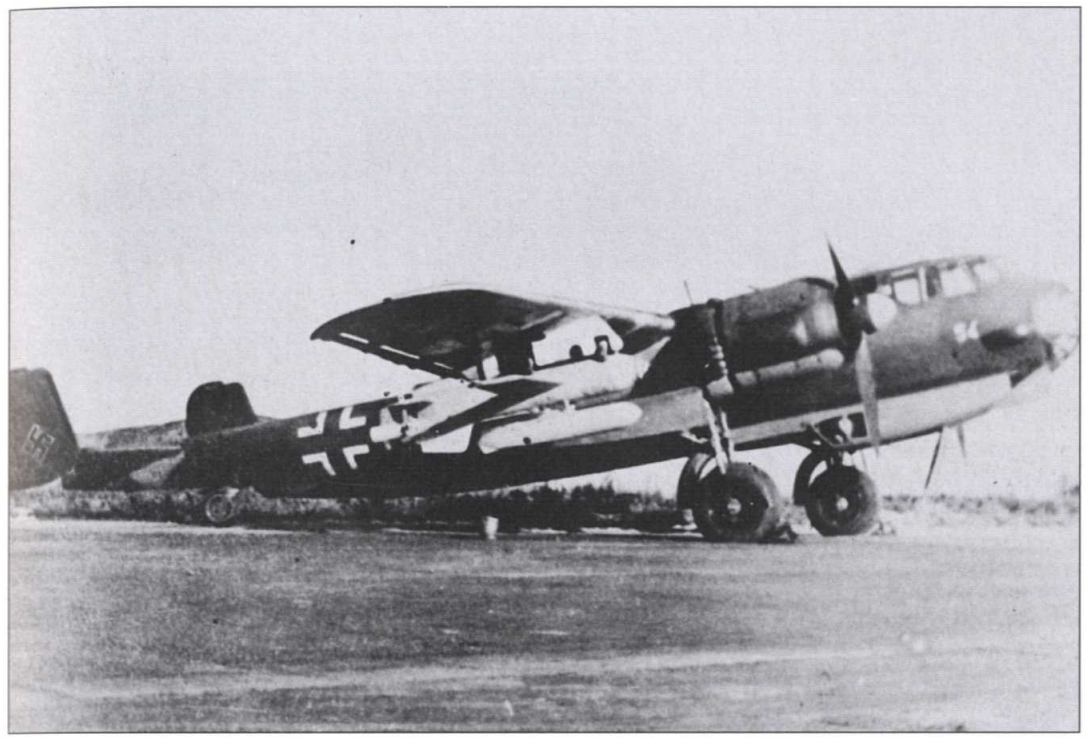




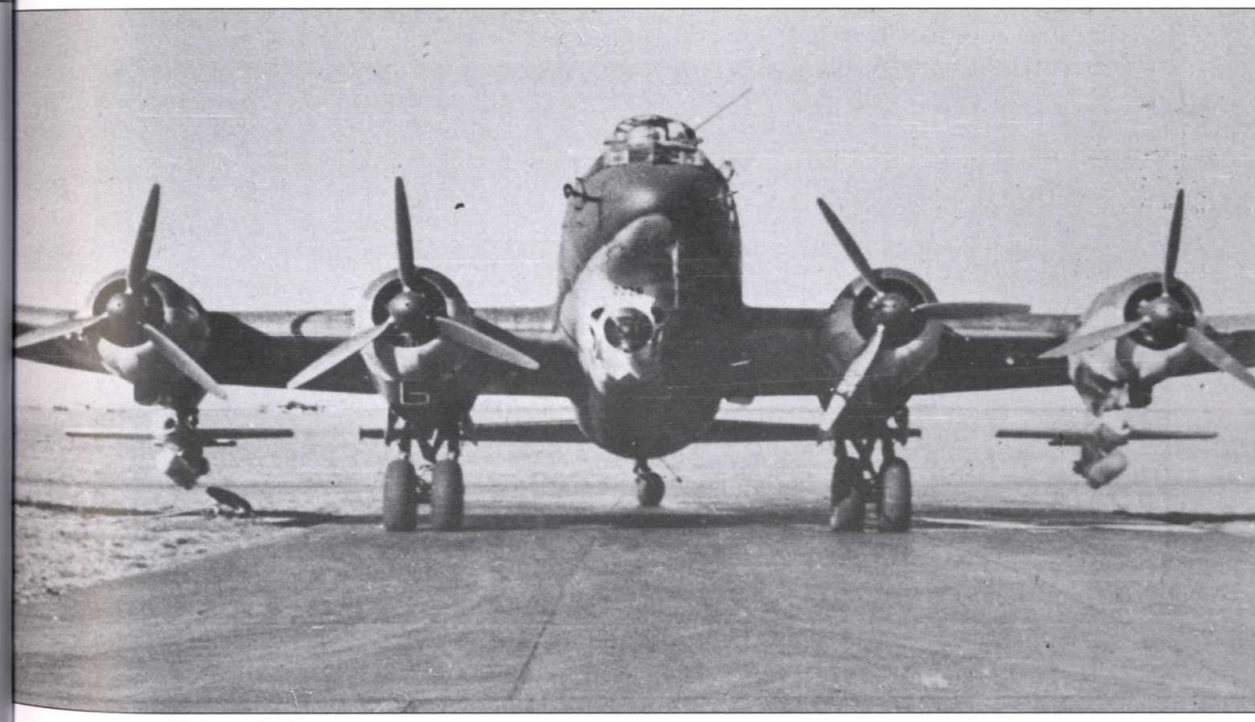
Due to delays in bringing the He 177 and the Ju 290 into operational service, the Fw 200 Condor was not replaced in the maritime reconnaissance role until well into 1944. via Schliephake



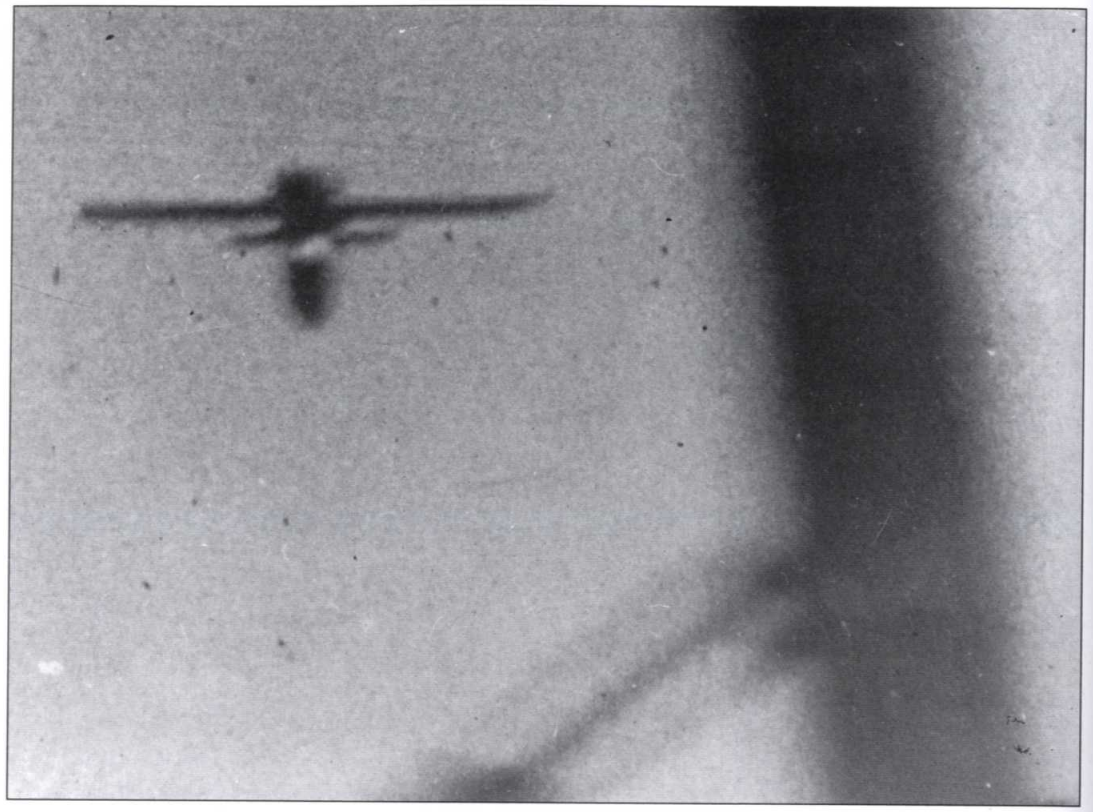
Henschel Hs 293 radio-controlled glider bomb. After launch, the rocket motor under the fuselage boosted the missile to speeds around 370 m.p.h. Then, its fuel exhausted, the missile coasted the rest of the way to the target.



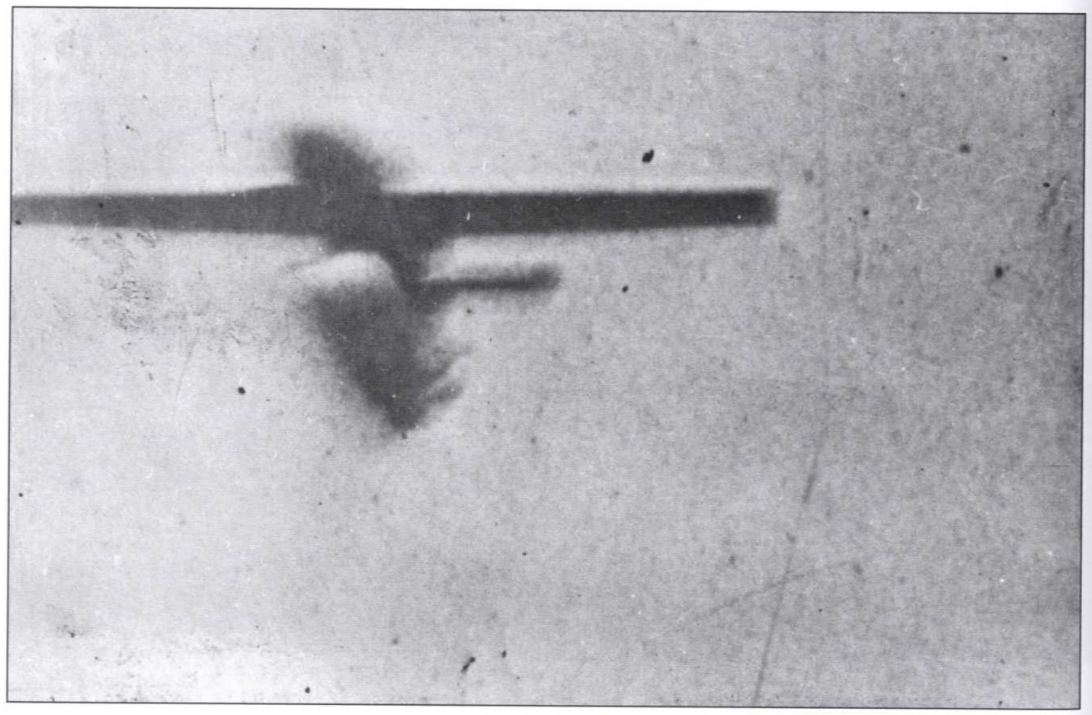
Hs 293 under the starboard wing of a Do 217 of II./KG 100. During long-range missions, the aircraft carried a drop tank under the port wing to serve as a counterbalance.

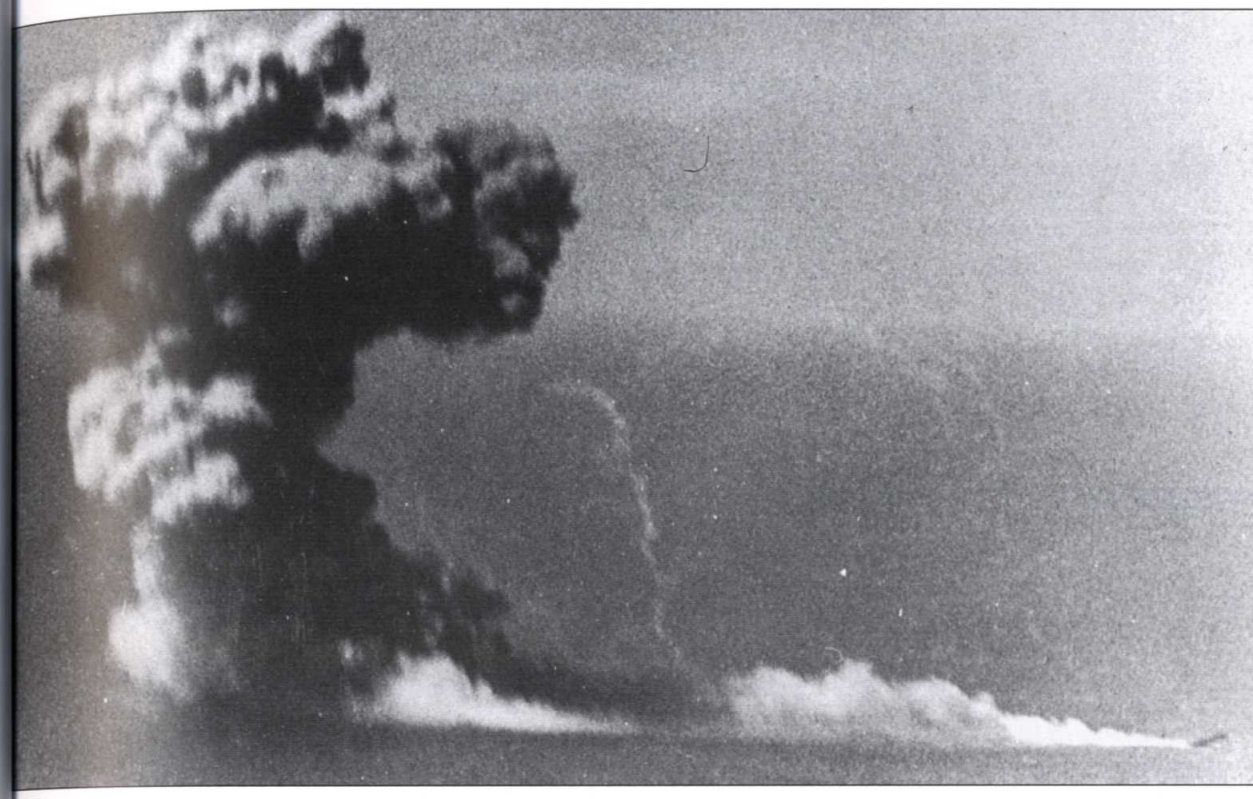


Fw 200 with an Hs 293 under each outer engine.



Stills from a remarkable cine film taken by a Royal Navy officer, showing an Hs 293 heading towards his warship. The glider bomb missed, though not by much!





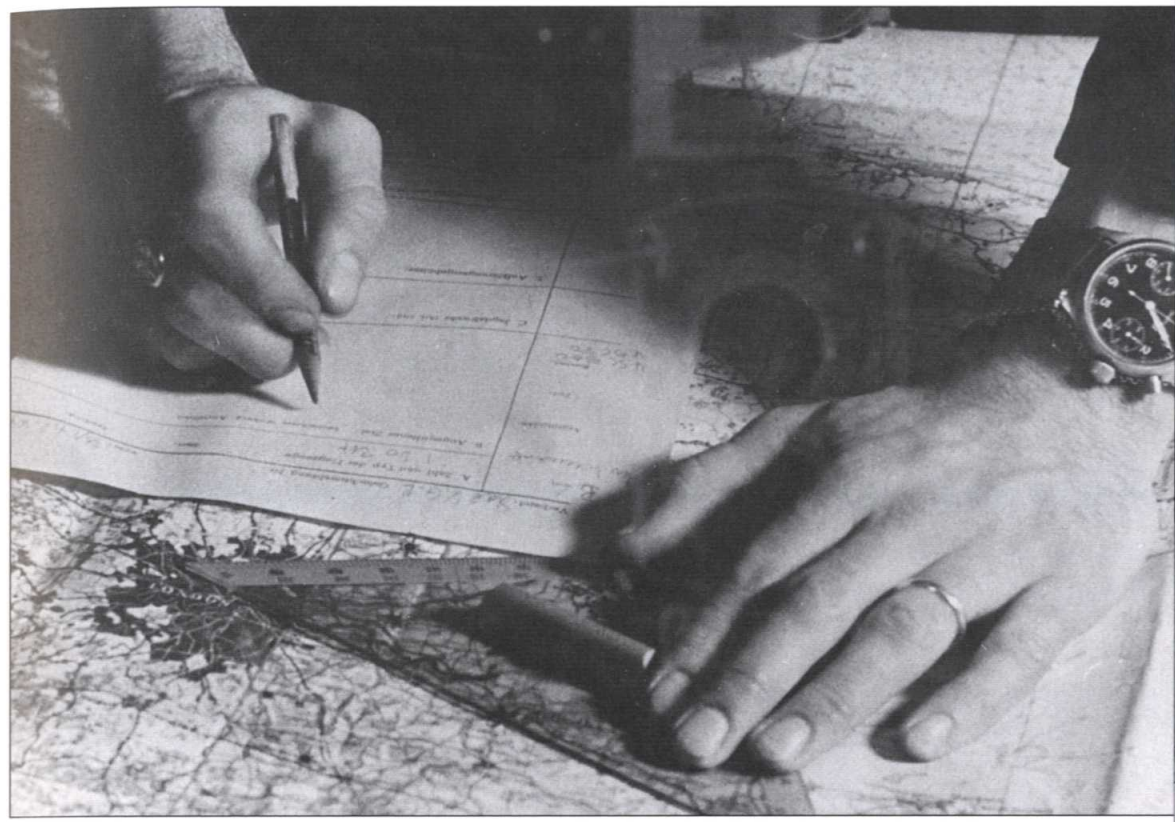
The frigate HMS *Egret* was the first warship sunk by an air-launched guided missile. On 27 August 1943 she was struck amidships by an Hs 293; the detonation set off depth charges in her magazine and she sank with heavy loss of life.

In the months leading up to the Allied invasion of France, the main Luftwaffe airfields in western Europe came under heavy and sustained bombardment. These three photos show Ju 88C fighters and Fw 200s wrecked at Bordeaux/Merignac airfield during a damaging attack on 27 March 1944 by 123 B-17 Flying Fortresses. Trenkle

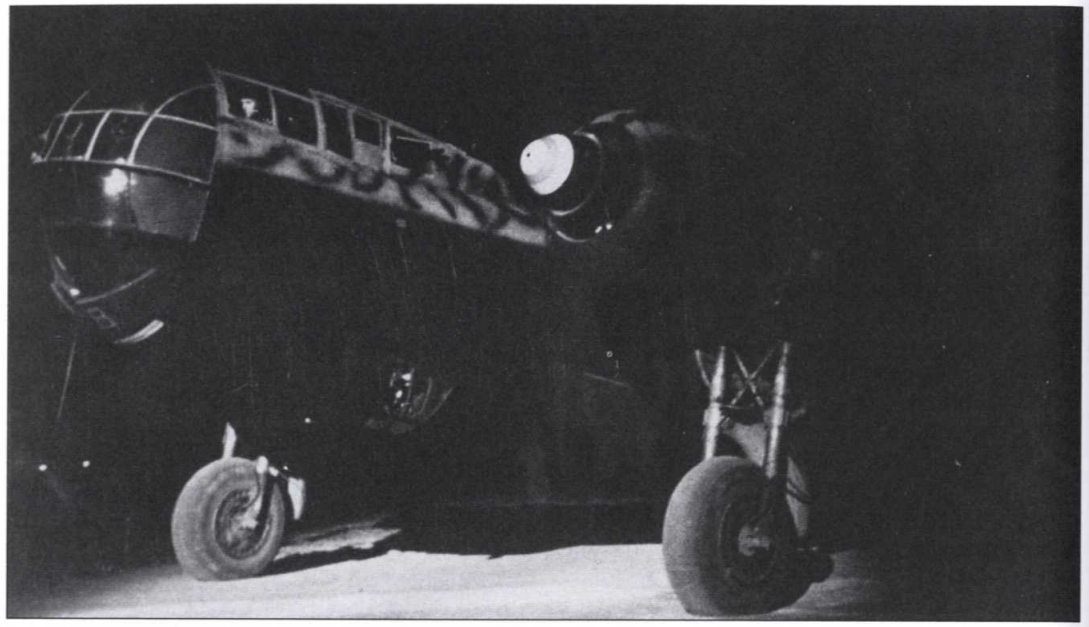
Three photographs taken during the briefing of crews of I./KG 2 for the attack on London on the night of 23/24 February 1944. The briefing took place at the unit's forward base at Melun/Vilaroche south of Paris. The Gruppe despatched thirteen Do 217s on this mission. Here Major Schönberger, the Gruppe commander, is seen giving the main briefing.

Crews taking notes during the Gruppe commander's briefing.

Hauptmann Kurt Seyfarth briefing crews of I./KG 2.

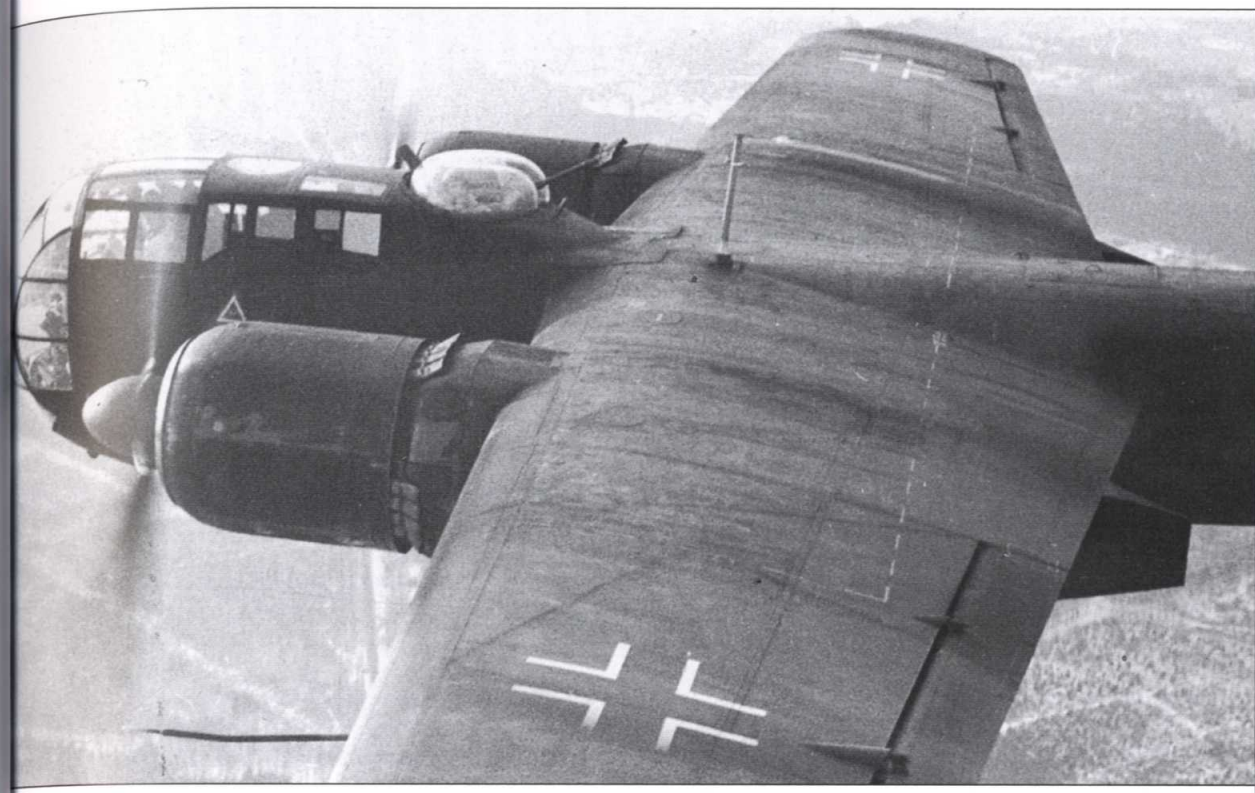


The unit's target that night was Millwall docks and the adjacent warehouse area.

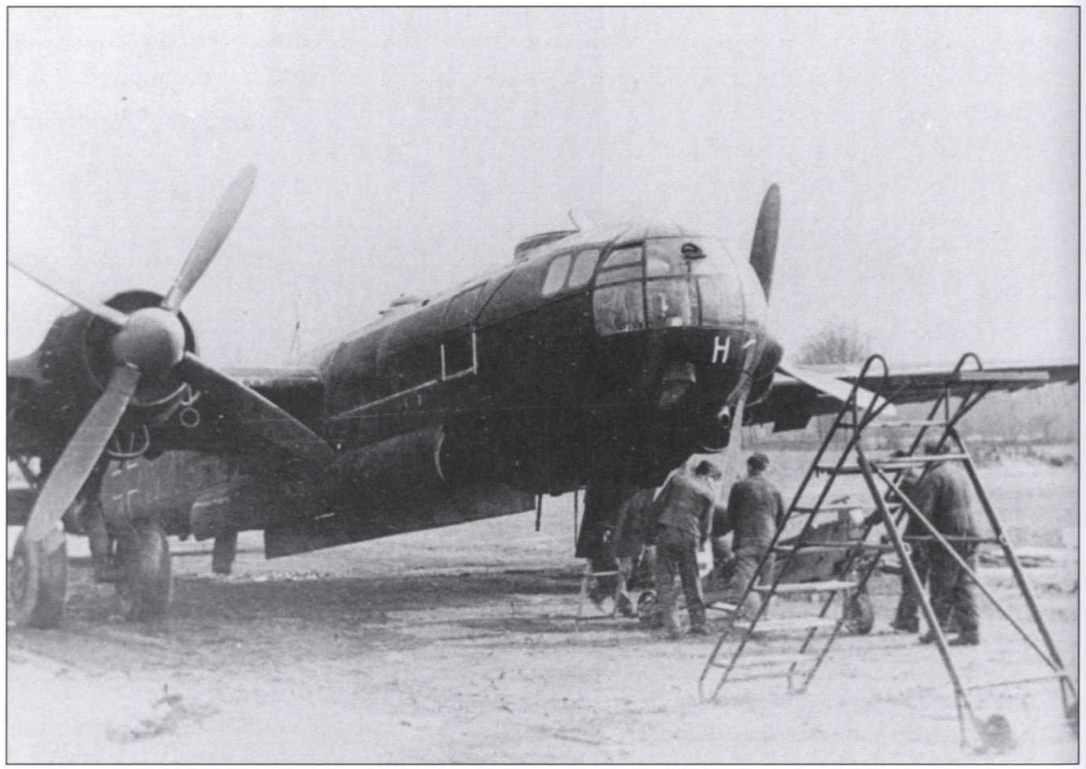


Do 217M belonging to KG 2 taxies out for a night raid.

Close-up of the nose of a Do 217M. Note the balloon cable cutting blade running horizontally round the leading edge of the cockpit glazing.



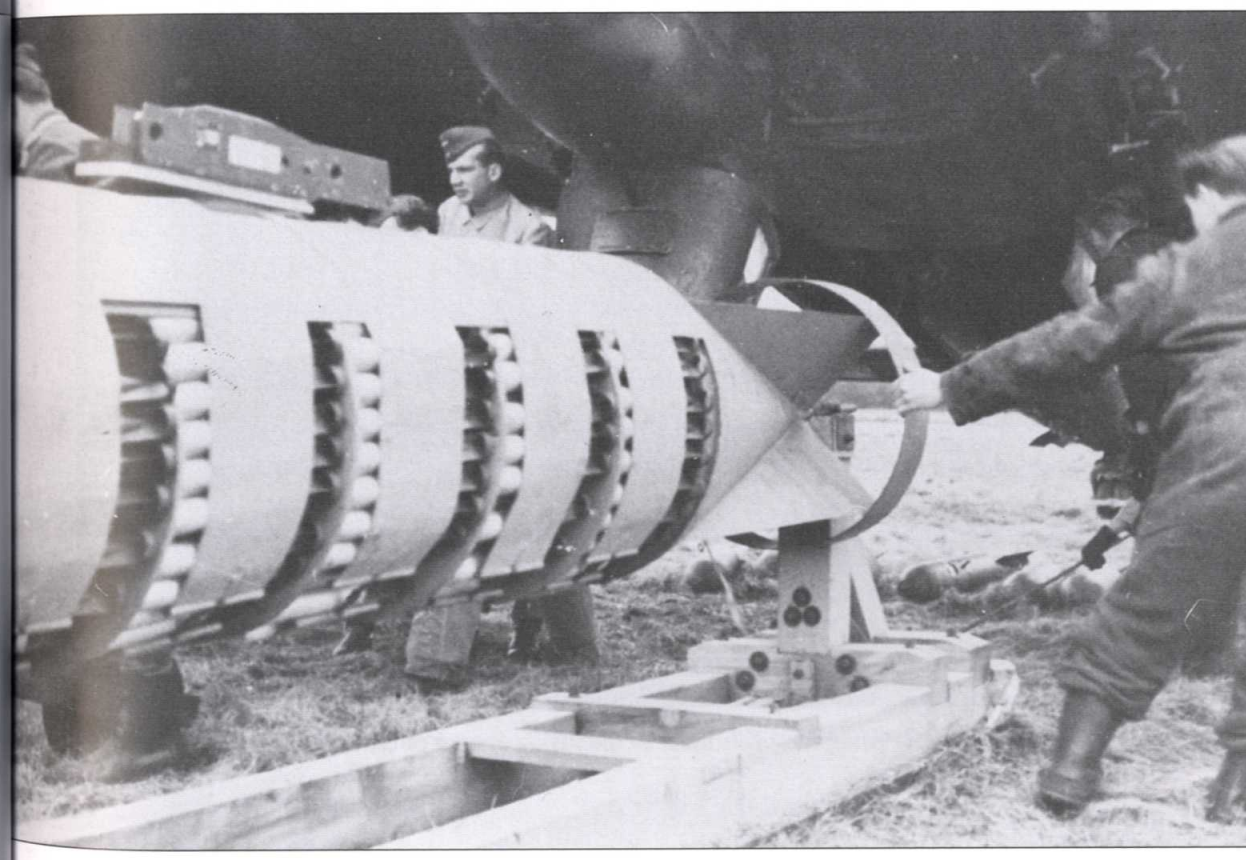
Do 217M of KG 2.

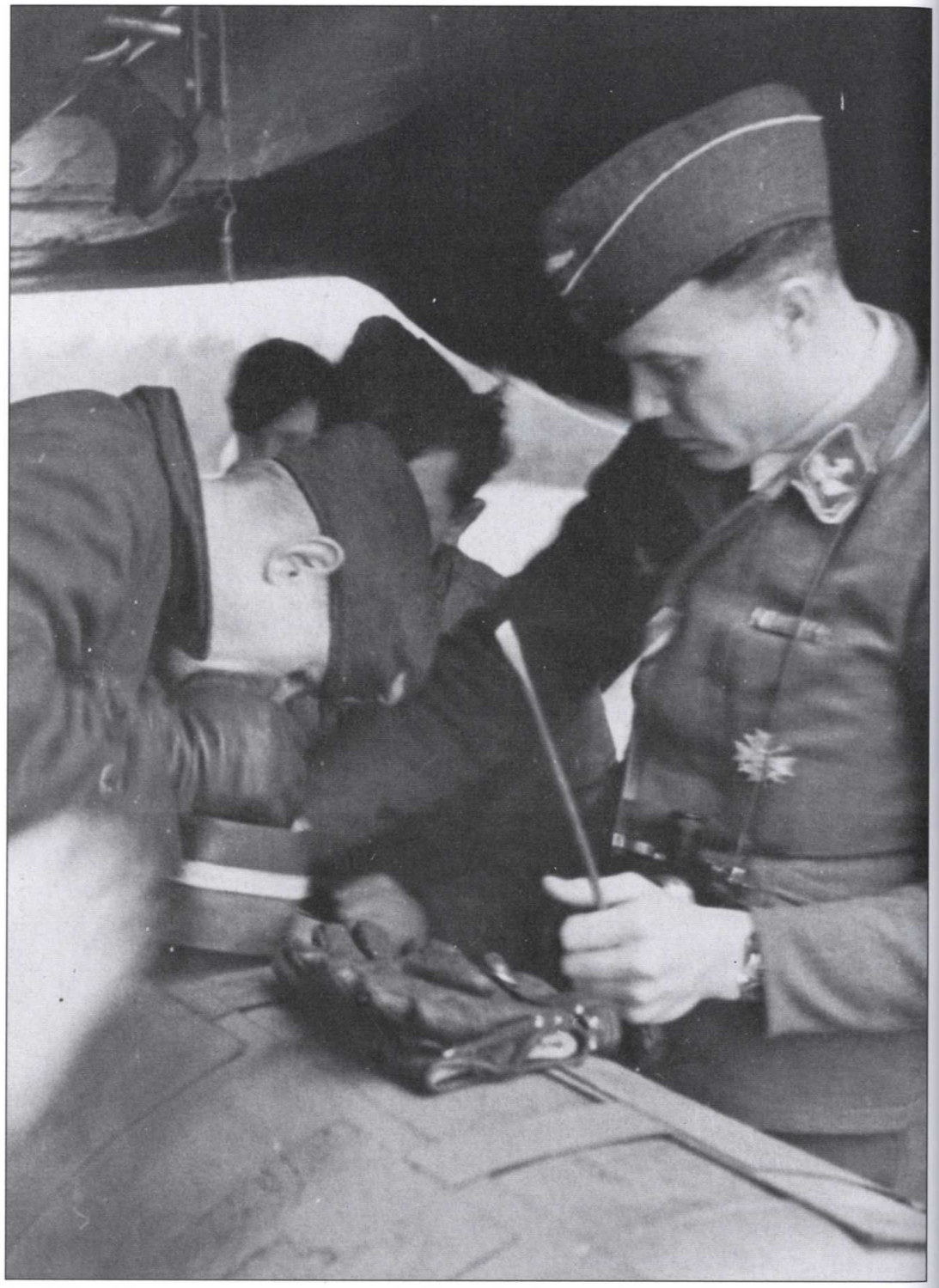


(*Above and left*) Heinkel He 177 heavy bombers of I./KG 100, pictured at the time of the attacks on London and other British cities during the early months of 1944. The aircraft was fitted with an unusual coupled engine arrangement with two motors in each nacelle driving a single propeller via a gear box. Initially the system had given considerable trouble, but by the beginning of 1944 its problems had largely been solved. As a result the heavy bomber was at last able to perform effectively, after reaching full scale service nearly two years late.

He 177s of I./KG 40 also took part in these raids on England at that time.

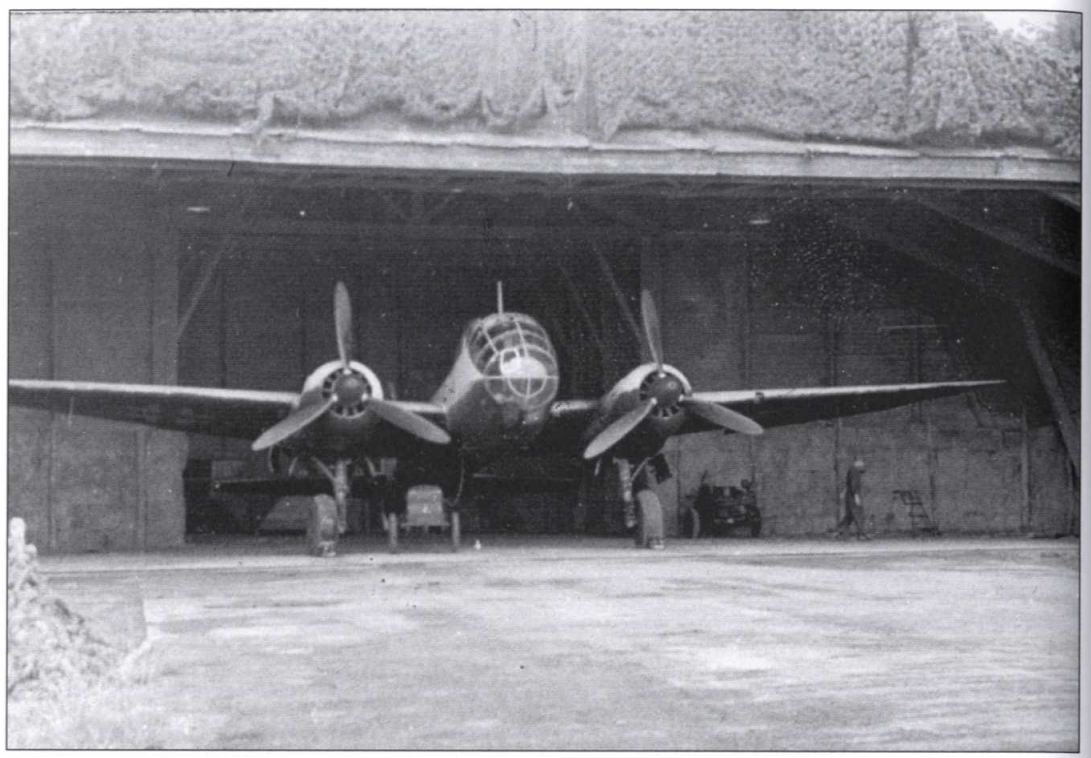
Groundcrewmen of I./KG 76 arming a Ju 88 in readiness for an attack on England. The weapon is an AB 1000 container, fitted with 620 incendiary bombs. After the container was released from the aircraft over the target, the layers of incendiaries were released at pre-set intervals to scatter them over a wide area.



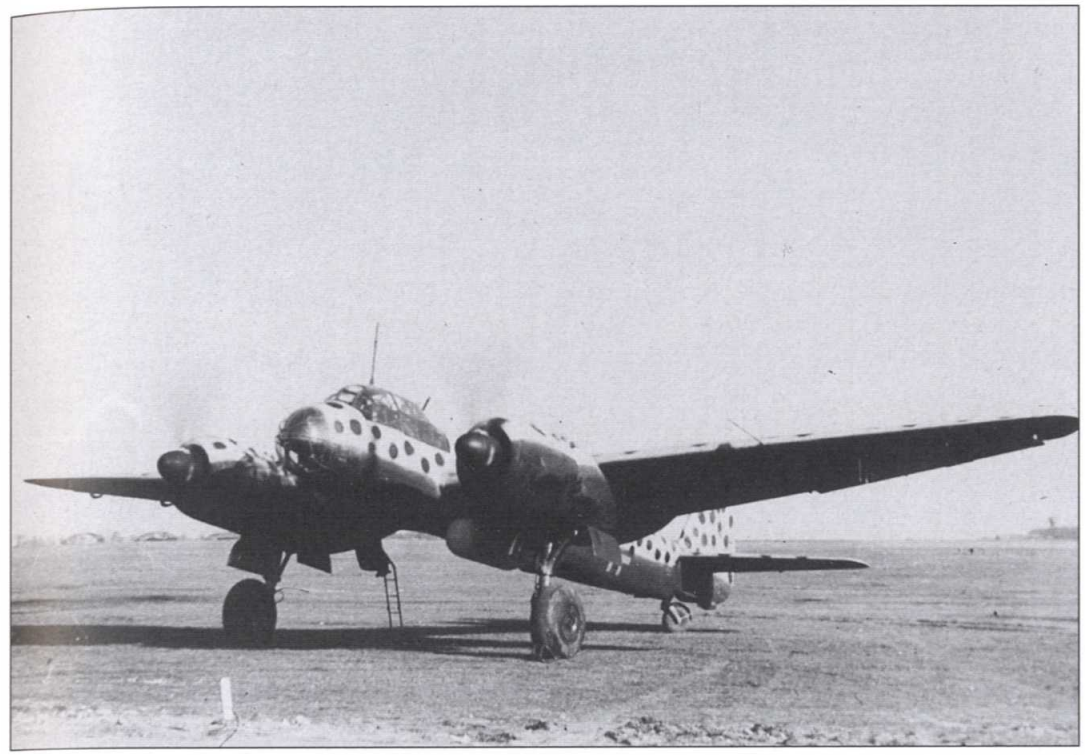


Armament NCO supervising the adjustment of the fusing system of the AB1000 incendiary bomb container.

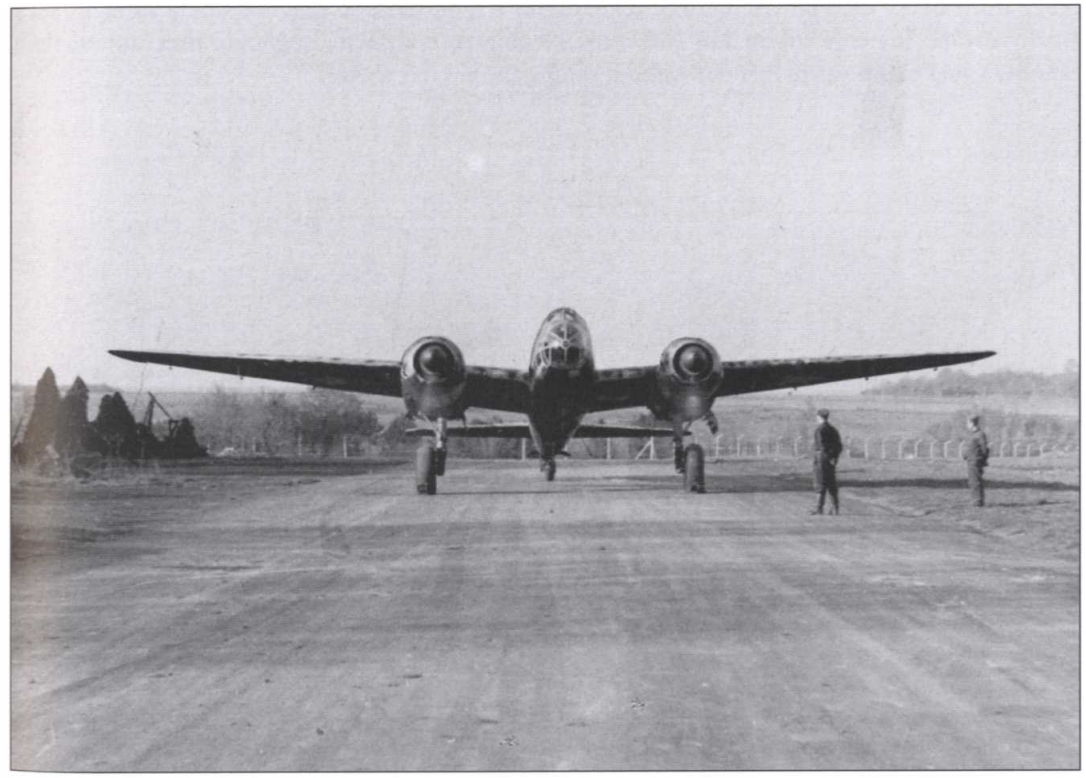
With the bomb container in place under the wing of the Ju 88, the aircraft is refuelled for the next mission.



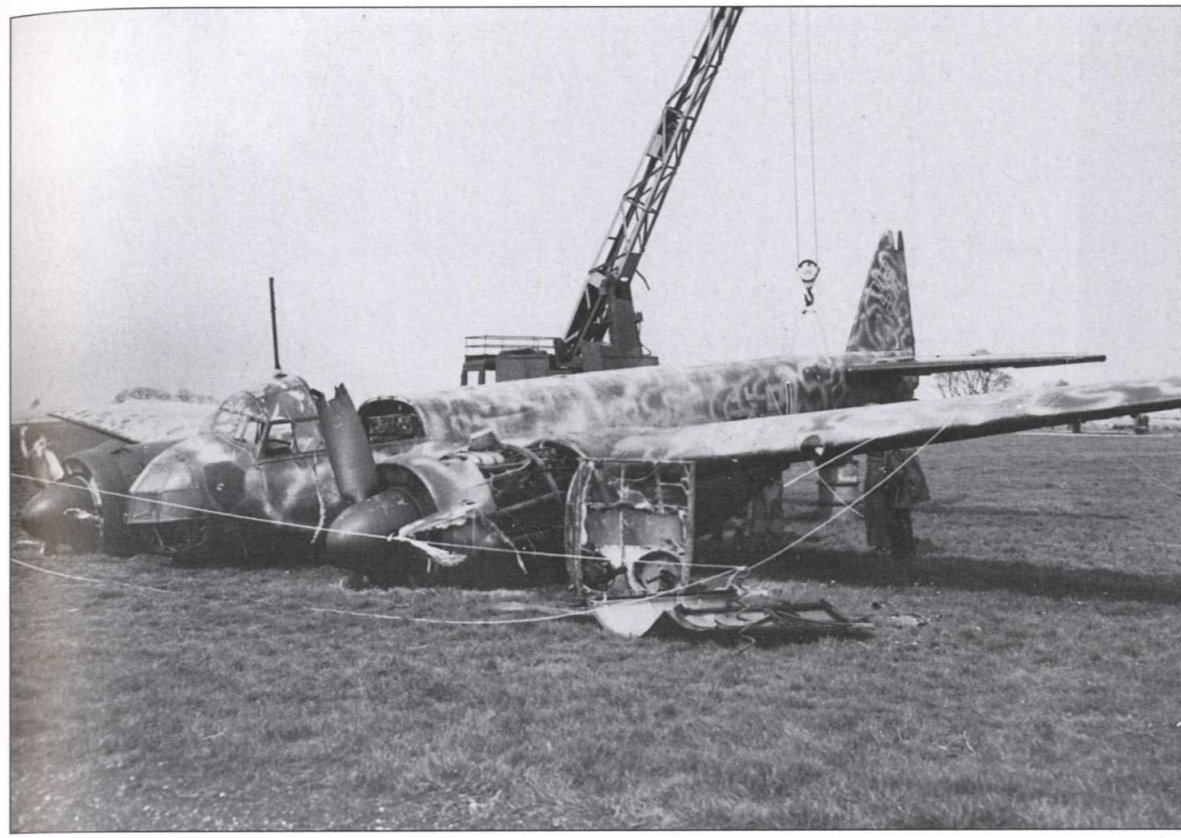
Junkers Ju 188 bombers of the pathfinder unit I./KG 66, which marked targets for the raiders during the 1944 attacks on England. Altrogge



Ju 88S of I./KG 66. This variant was fitted with nitrous oxide injection, which boosted engine power and enabled it to attain altitudes around 33,000 feet over the target. Trenkle



Lucky escape for crew of an He 177 crew which returned from England, after one of their bomber's fuel tanks was blown out without setting the aircraft ablaze.



This Ju 88 of I./KG 54 was damaged by AA fire over London on the night of 18/19 April 1944. The aircraft crash-landed at the RAF night-fighter base at Bradwell Bay in Essex.

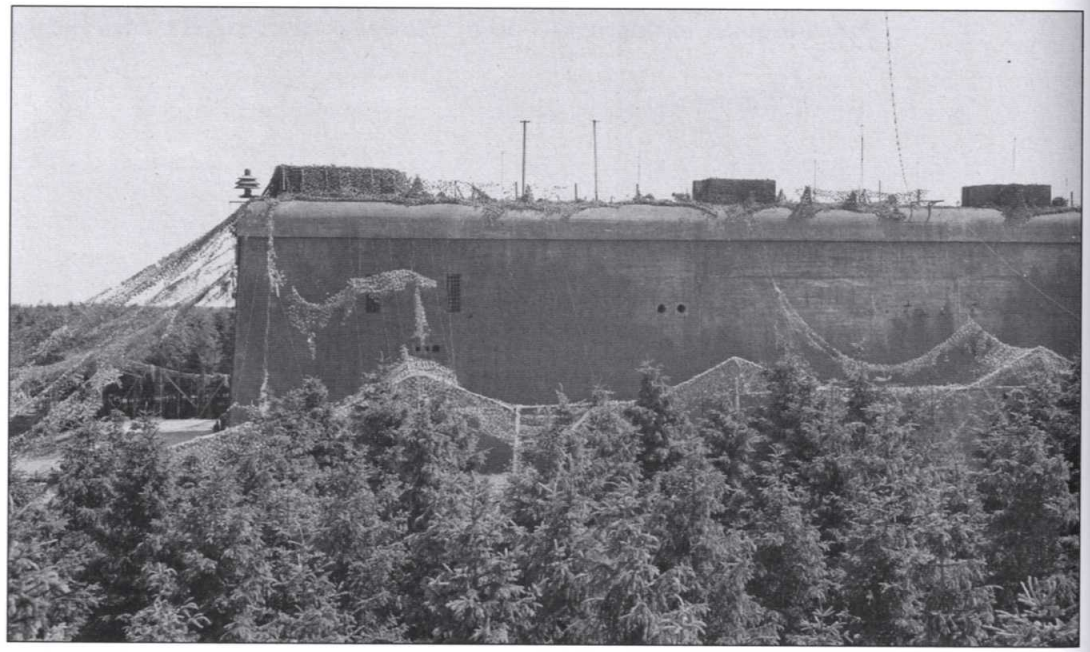
Fw 190 fighter-bomber of the ubiquitous SKG 10, which served on each of the major battle fronts and from time to time flew missions against England. Wenk

Field Marshal Erwin Rommel (centre of group of inspecting officers, holding baton) reviewing pilots and ground crews of III./JG 26 in France shortly before the invasion. To the right of the army commander is Oberst Josef 'Pips' Priller, the Geschwader commander. To the right and slightly behind Priller is the commander of III. Gruppe, Major Klaus Mietusch.

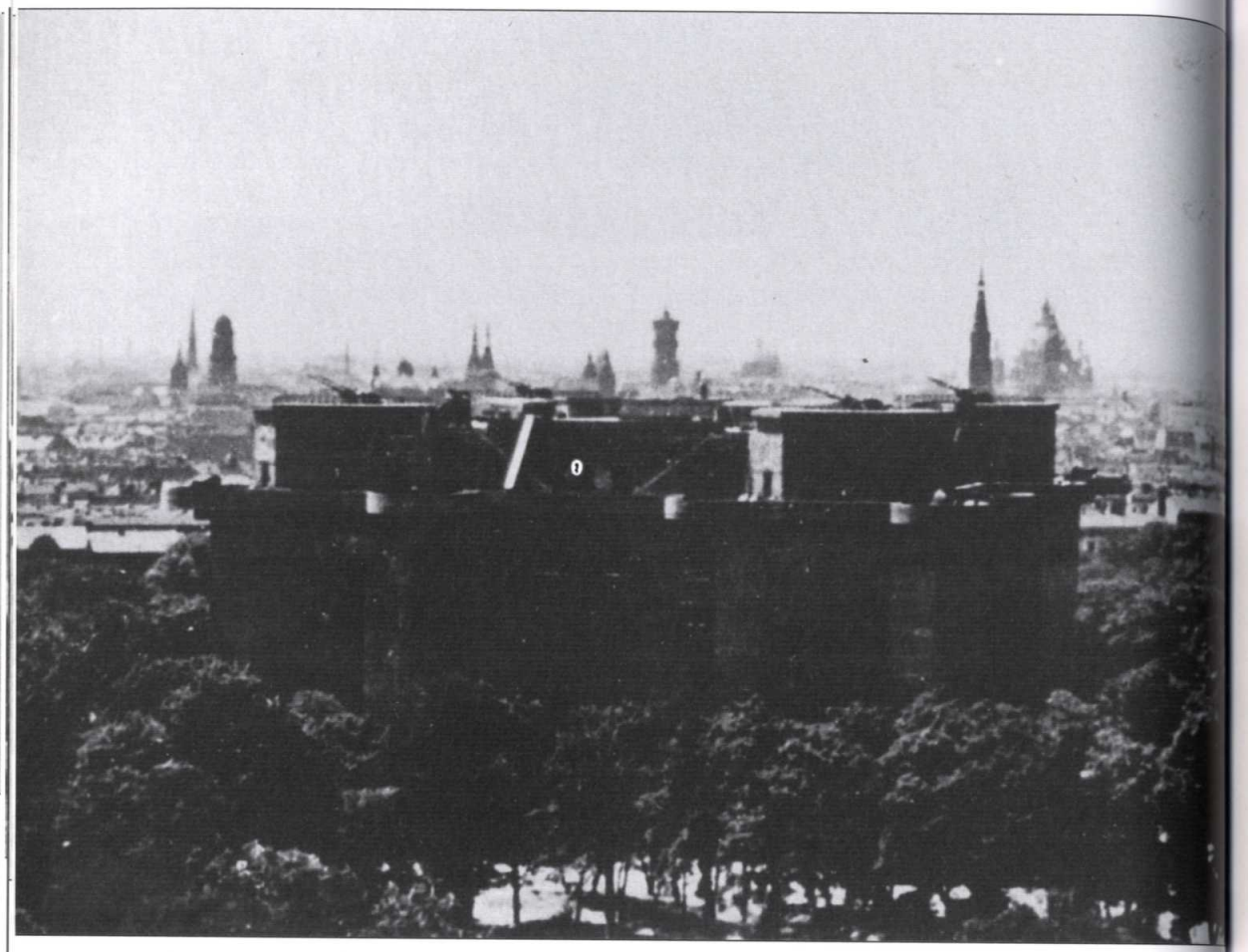
IN DEFENCE OF THE FATHERLAND

OCTOBER 1942 – MAY 1944

From massive concrete operations bunkers, such as this carefully camouflaged example near Grove in central Denmark, the Luftwaffe directed its fighters during the great day and night battles over Germany. The top of the bunker was over 60 feet high, with a bombproof roof 15 foot thick.

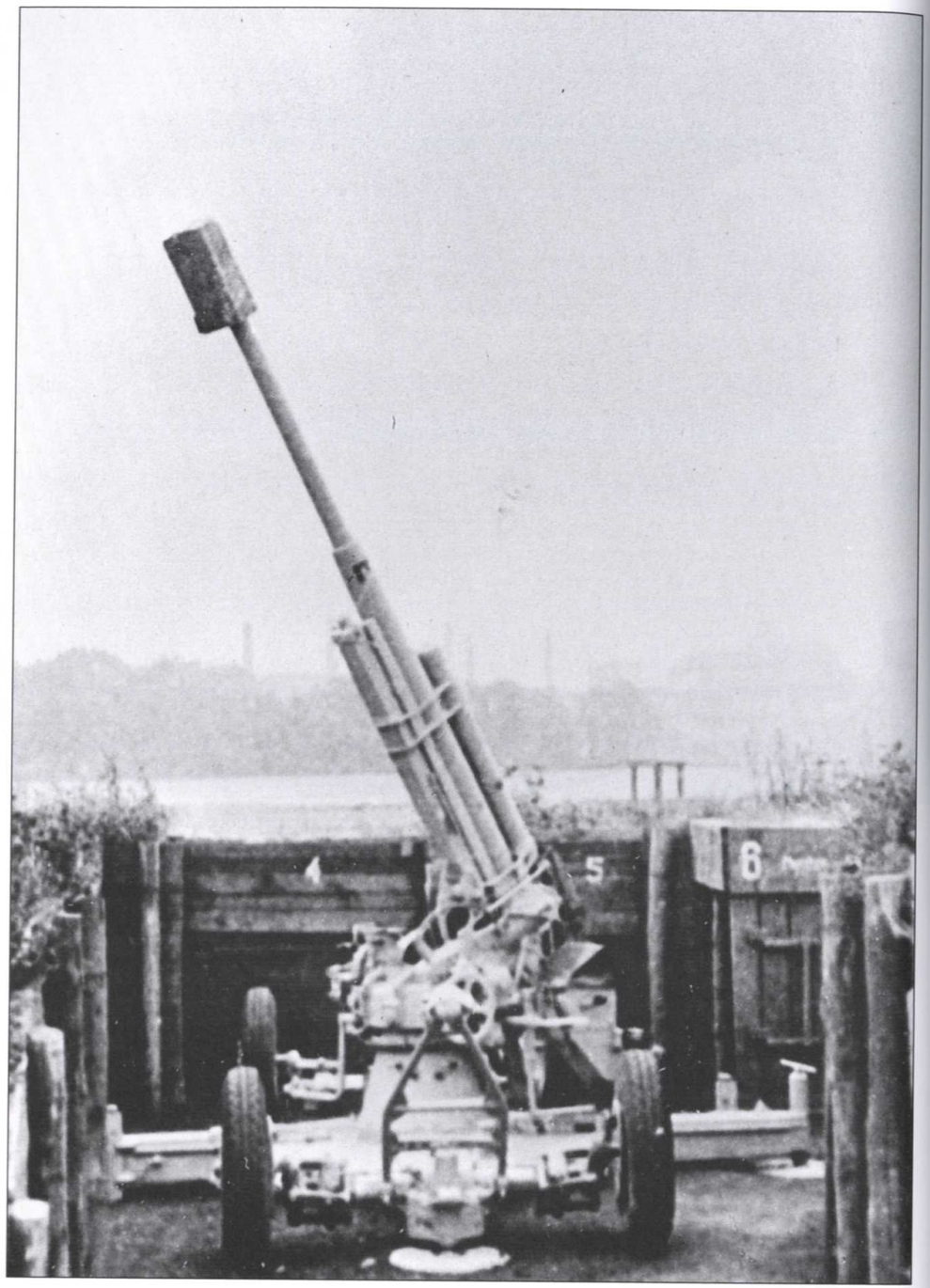


No photograph can adequately convey the sense of high drama, bustle and urgency of a fighter operations room while an action was in progress. This artist's impression comes close, however. The Chief Operations Officer (1) sat near the rear of the 'stalls' with his broadcast officer on his right. In front of him sat the fighter liaison officers, in telephone contact with the fighter bases. The air situation picture was flashed on to the rear of the translucent map (5, 6) by female auxiliaries using light projectors.



Huge flak towers were erected to stiffen the defences at major cities, like this one in the Friedrichshain district of Berlin. The lower level of the building served as a civil defence headquarters, and below that was a large public air raid shelter.

'Flak you could walk on' was a term often used loosely, but this picture taken from a B-24 during the attack on Berlin on 6 March 1944 shows how fierce the flak could get. Although the gunners shot down few aircraft, they inflicted damage on many of them.

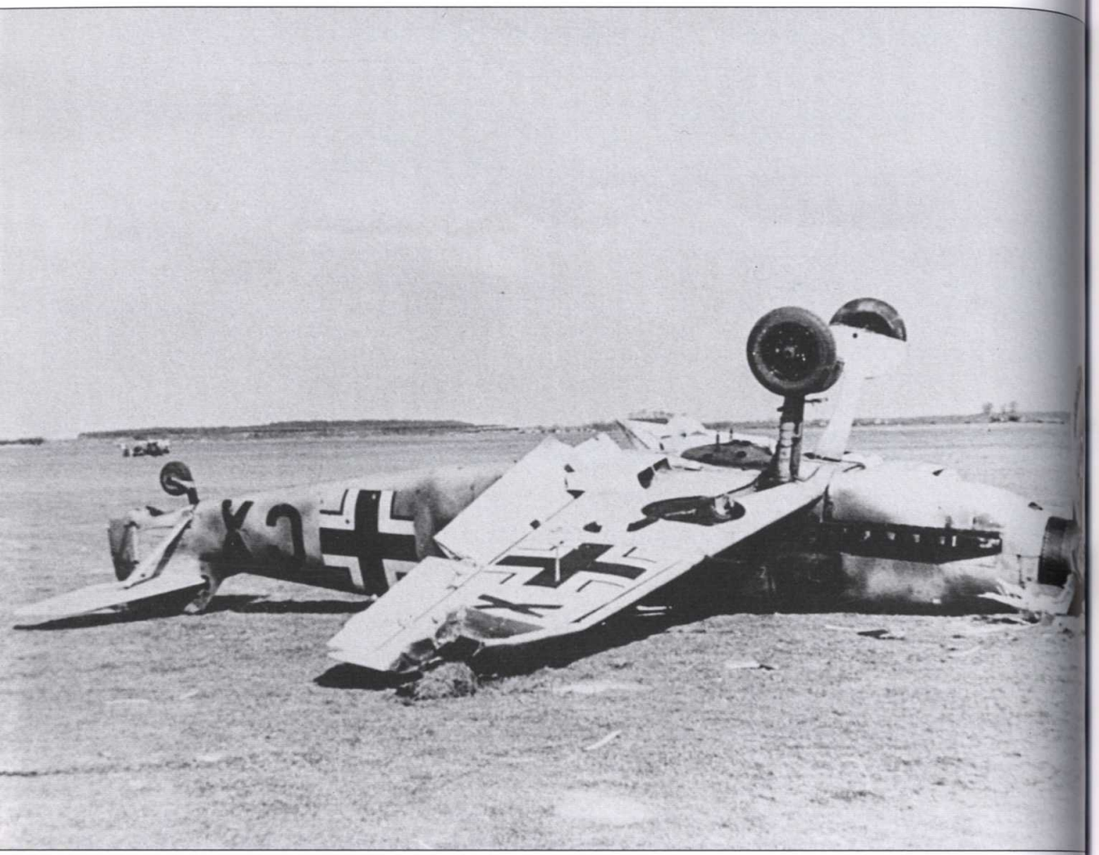


During the latter part of the war the Luftwaffe made use of captured AA weapons to stiffen the defences of the homeland. This Russian 8.5-cm gun had been rebored to take the standard German 8.8-cm round. The object on the end of the barrel was a cover.

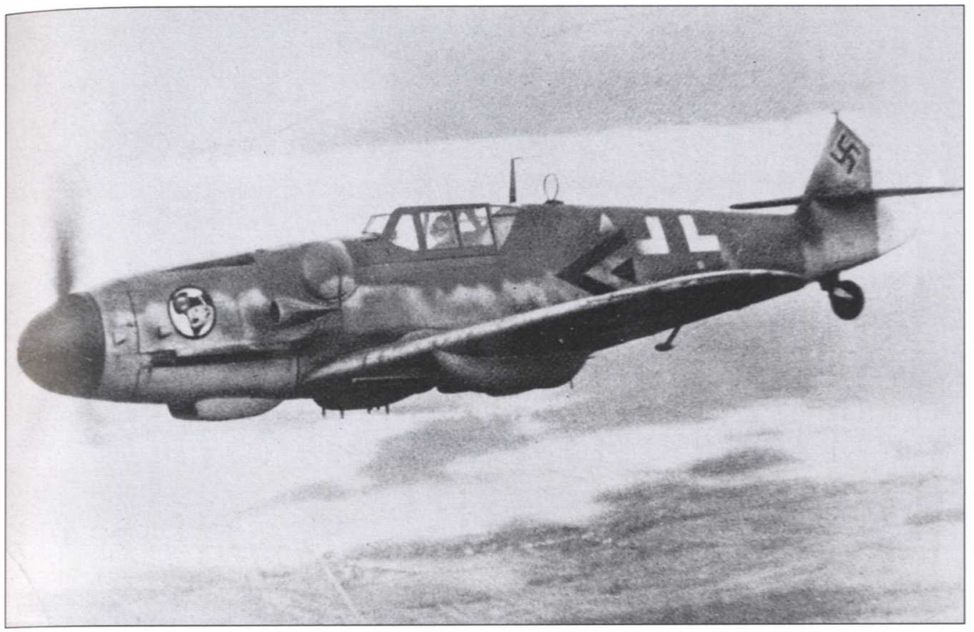
10.5-cm guns mounted on railway flats firing a salvo.

Bf 109G-2 of JG 11 based at Jever late in 1943, fitted with underwing launchers for two 21-cm air-to-air rockets for use against US heavy bomber formations.

Fighter Ace Oberleutnant Heinz Knocke of II./JG 11 pictured with his Bf 109G-6 in the spring of 1944, when the unit was based at Wunstorf. Knocke

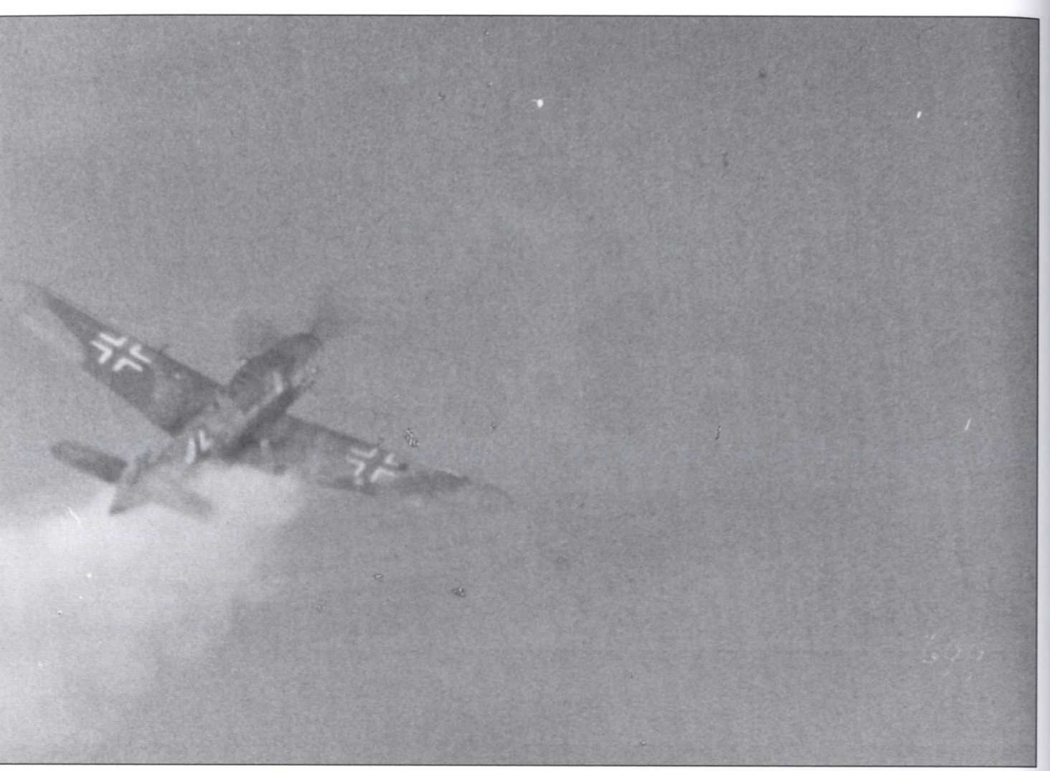


With its high-powered engine and small wing, the Bf 109 'Gustav' did not suffer foolish or inexperienced pilots gladly. If he opened the throttle too quickly during take-off, the powerful engine torque could lift the starboard wing before the fighter attained flying speed. In that case the aircraft was liable to roll upside down and smash into the ground under full power, giving the pilot little chance of escape. via Schliephake



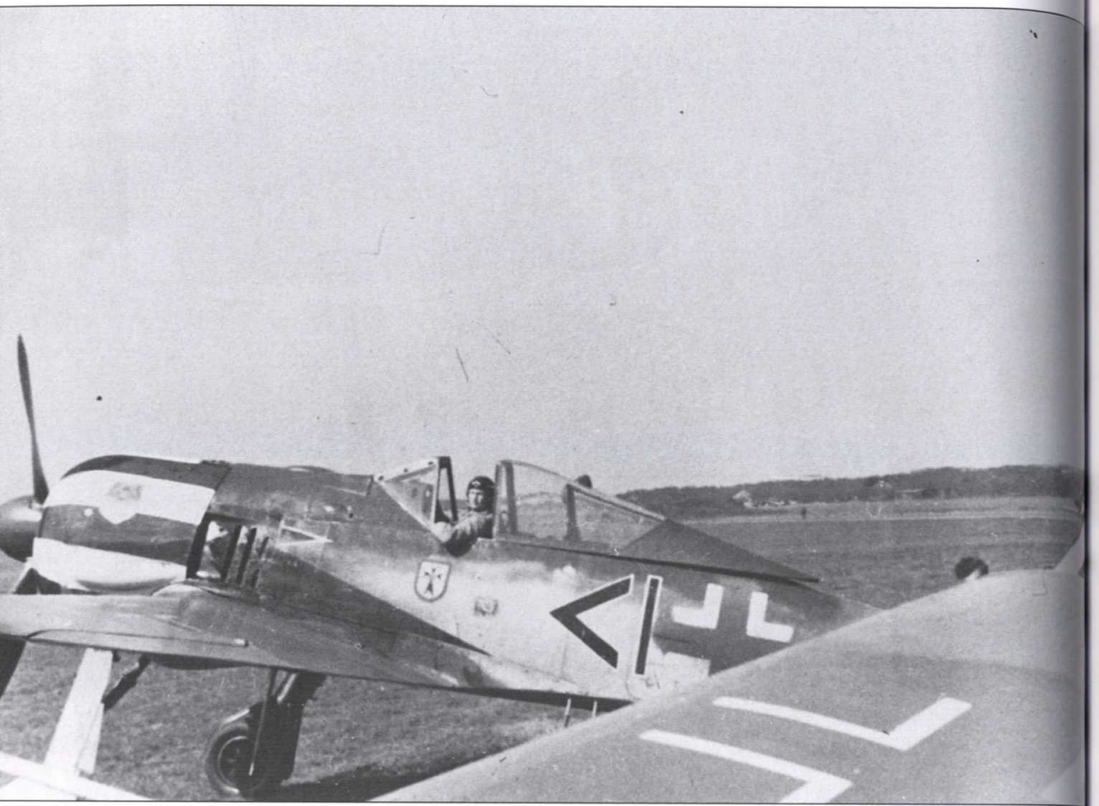
Bf 109G flown by Hauptmann Ludwig Franzisket, commander of I./JG 27 during the early months of 1944.

Bf 109G-6s of IIIrd Gruppe Jagdgeschwader 27 waiting at readiness at Wiesbaden-Erbenheim in 1944. Schroer



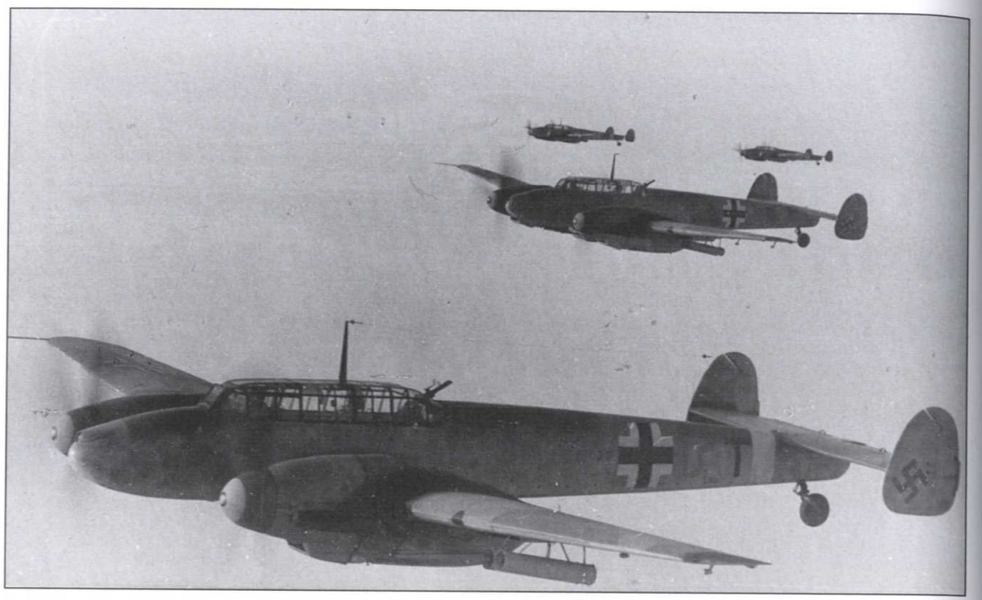
Damaged Bf 109G trailing glycol smoke, after being hit in the cooling system during an attack by a US escort fighter. Soon after this picture was taken the fighter finished off the 'Gustav'. USAF

An Fw 190 delivers the *coup de grâce* to a damaged B-17 forced out of formation, after the attack on the aircraft plant at Oschersleben on 11 January 1944. USAF

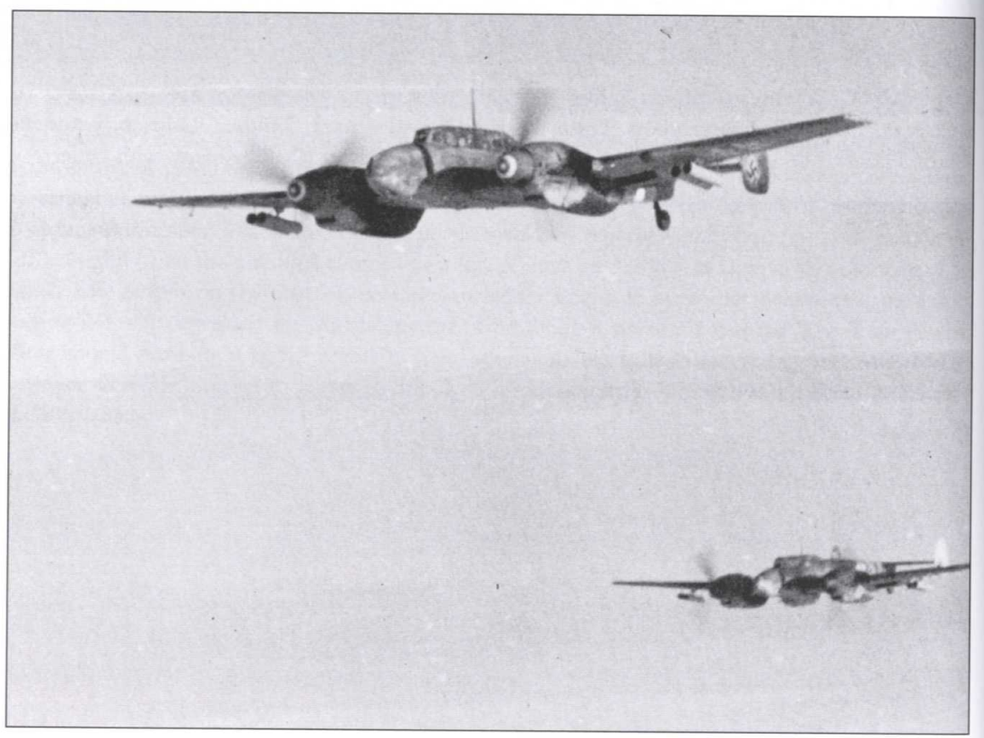


Fw 190 fighter of JG 1, bearing the distinctive black and white stripes carried by the unit's aircraft in the spring of 1944. From time to time Luftwaffe day-fighter units painted their engine cowlings in distinctive colours (yellow, white or red) or with distinctive patterns (stripes or checkerboard) to assist identification in combat. Despite persistent Allied reports to the contrary, such markings did *not* signify that the aircraft belonged to a 'crack' unit or that it was the personal mount of a fighter ace. Stripes on the nose of the German fighter might or might not denote that the pilot was an ace – it depended on who happened to be flying it on that particular day. That Allied pilots should attribute a higher status to their opponents than they deserved is understandable, however. Nobody wanted to admit having been frightened by anything but the best the enemy had available.

Ceremony at Berchtesgaden on 5 May 1944, to present the Ritterkreuz with Oakleaves to successful Luftwaffe fighter pilots. From the left Oberstleutnant Günther Radusch, Leutnant Anton Hafner, Major Rudolf Schönert and Major Wilhelm Herget (shaking hands with Hitler).



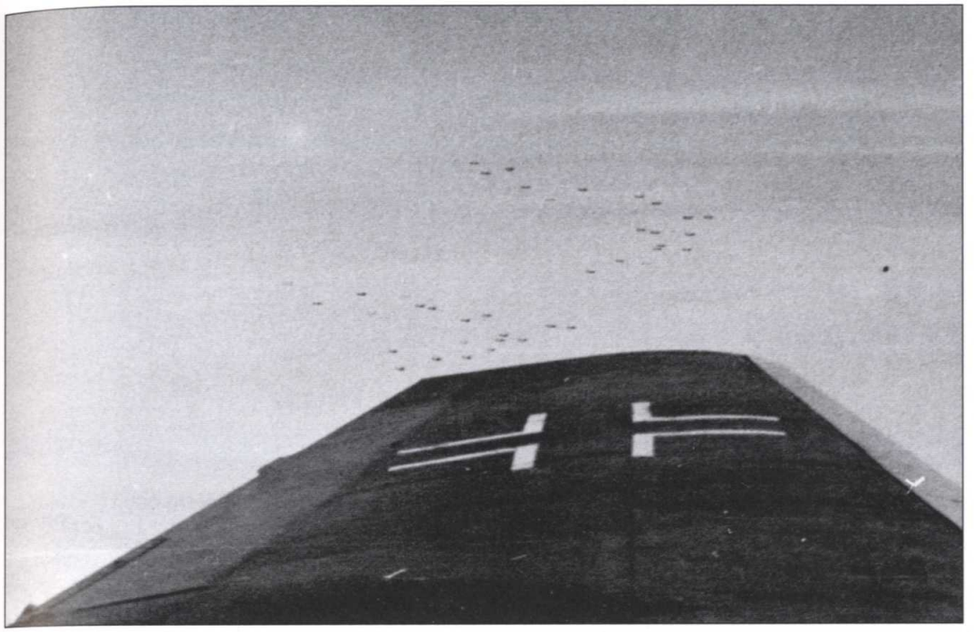
Messerschmitt Bf 110G bomber-destroyers of ZG 26. Each aircraft carries launchers for four 21-cm rockets under the outer wings.



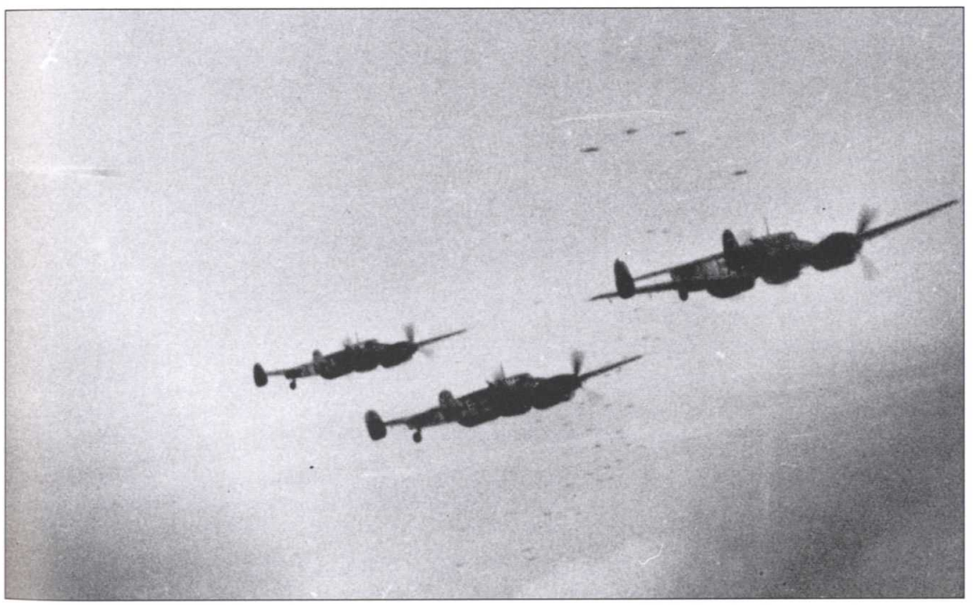
Bf 110Gs of ZG 76.

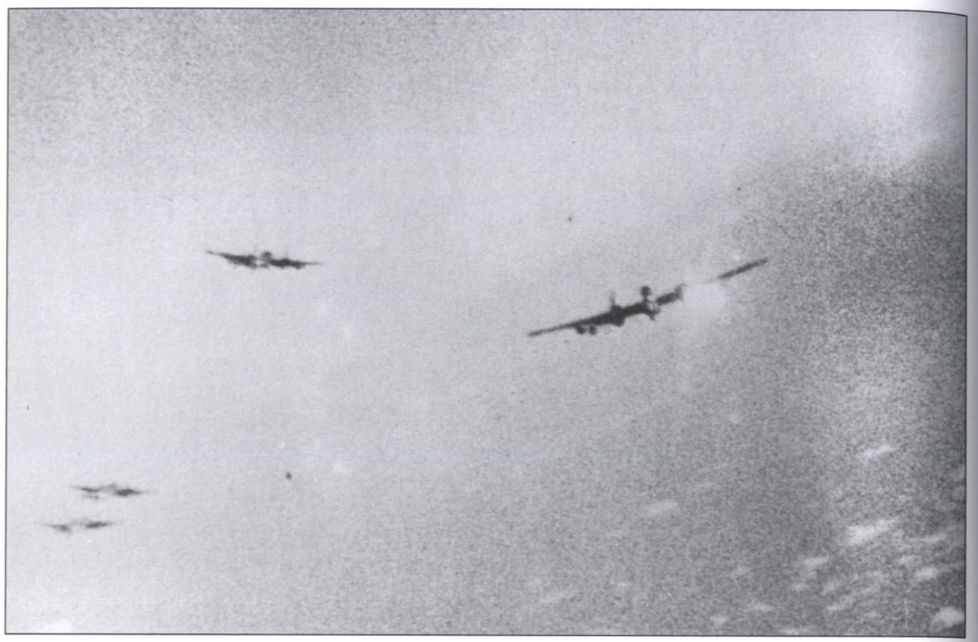
Fitting a 21-cm rocket into the underwing launcher tube of a Bf 110.

Rare photograph of a Bf 110 of ZG 76 carrying a modified 37-mm anti-aircraft gun mounted under the fuselage. The cumbersome installation seriously affected performance, and it saw little use in action. Haugk

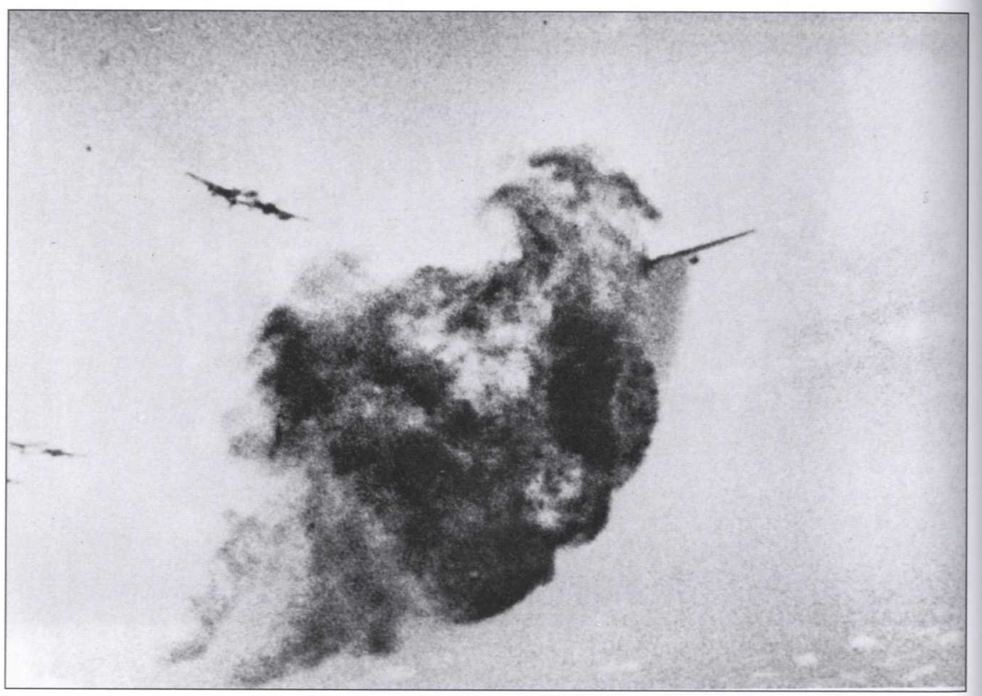


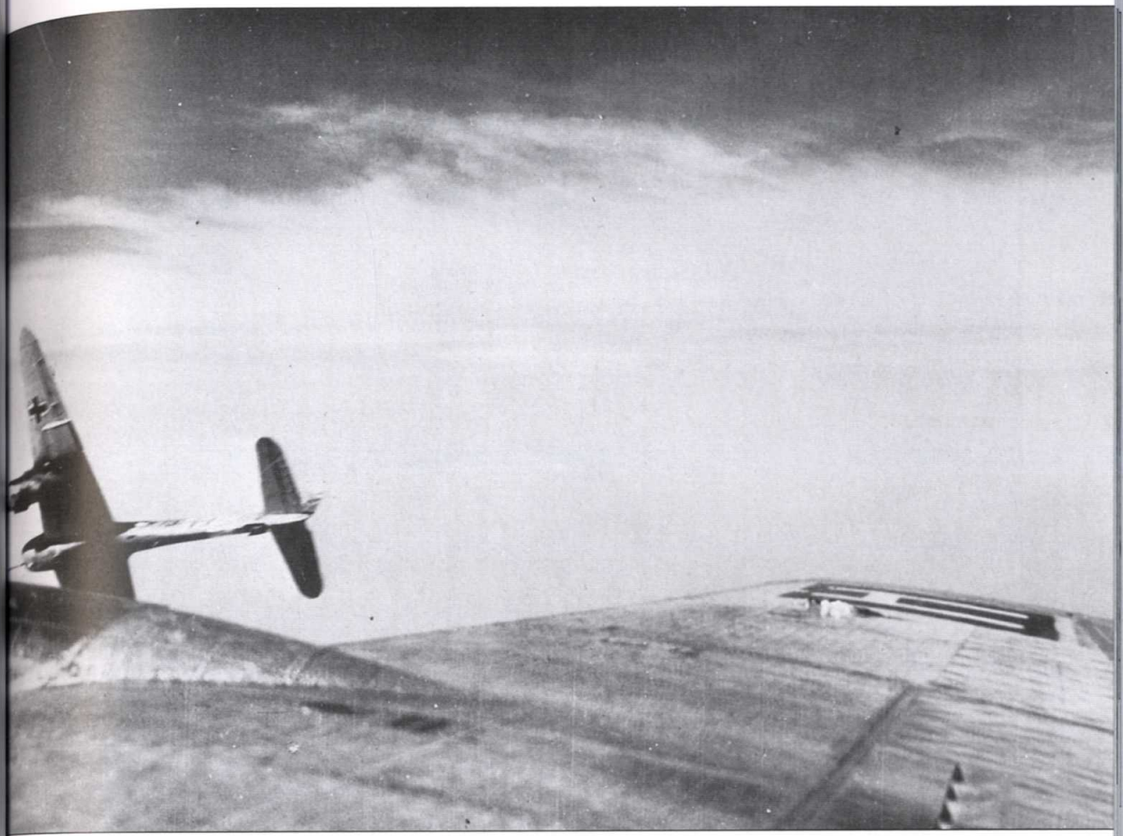
Bf 110s of III./ZG 26 moving into position to attack a formation of US heavy bombers (in the background) heading to attack targets at Cottbus, Rostock and Sorau on 11 April 1944. The unit concentrated its attacks on the 13th and 45th Bomb Wings, and accounted for most of the twenty-five bombers lost by these Wings during the attack. Kogler



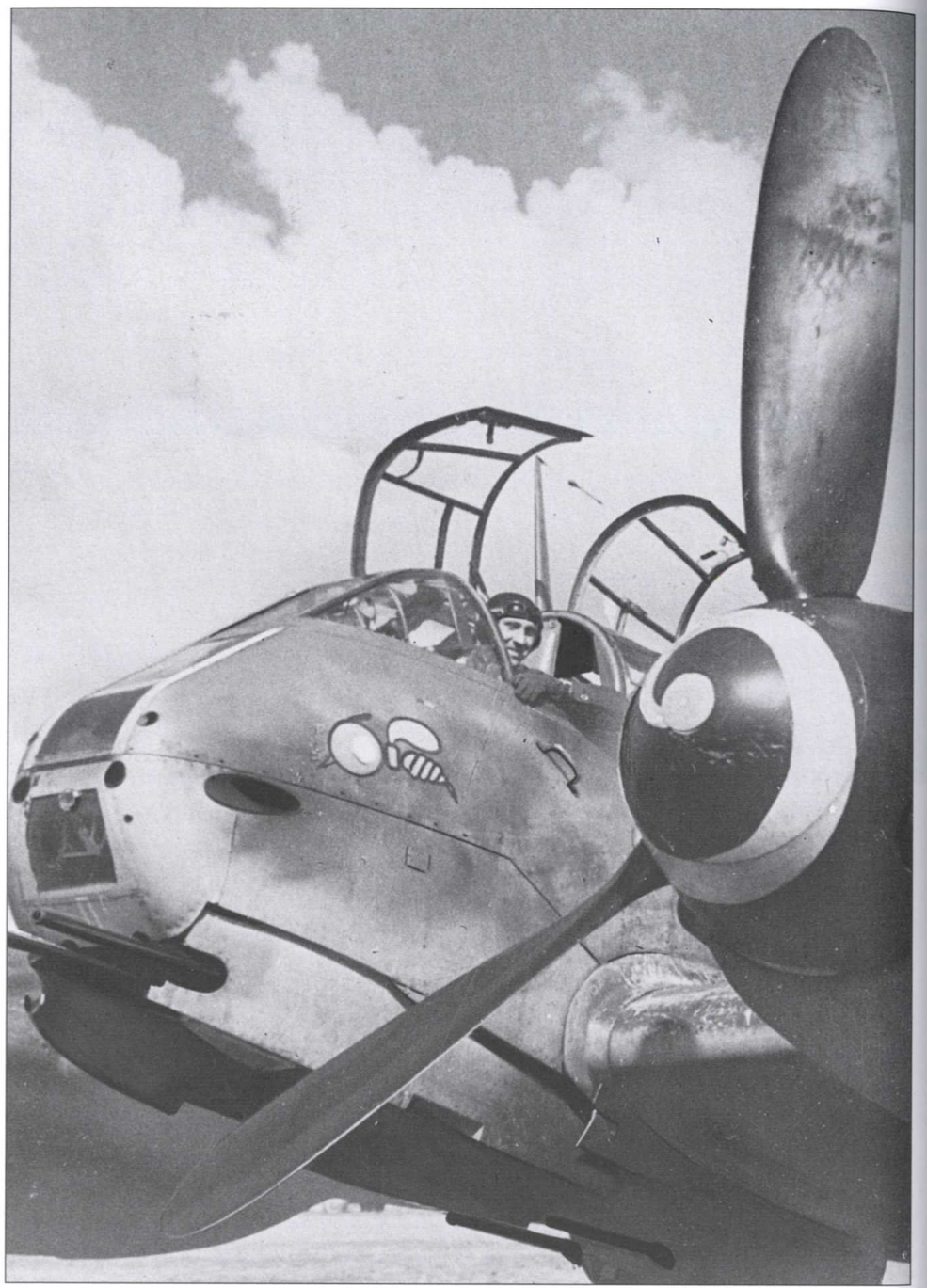


Illustrating the fate that awaited German bomber-destroyer units if they were caught by US escort fighters. A remarkable series of photographs taken by P-47 pilot Lieutenant Paul Conger of the 56th Fighter Group, during the action over the Frisian Islands on 11 December 1943. USAF

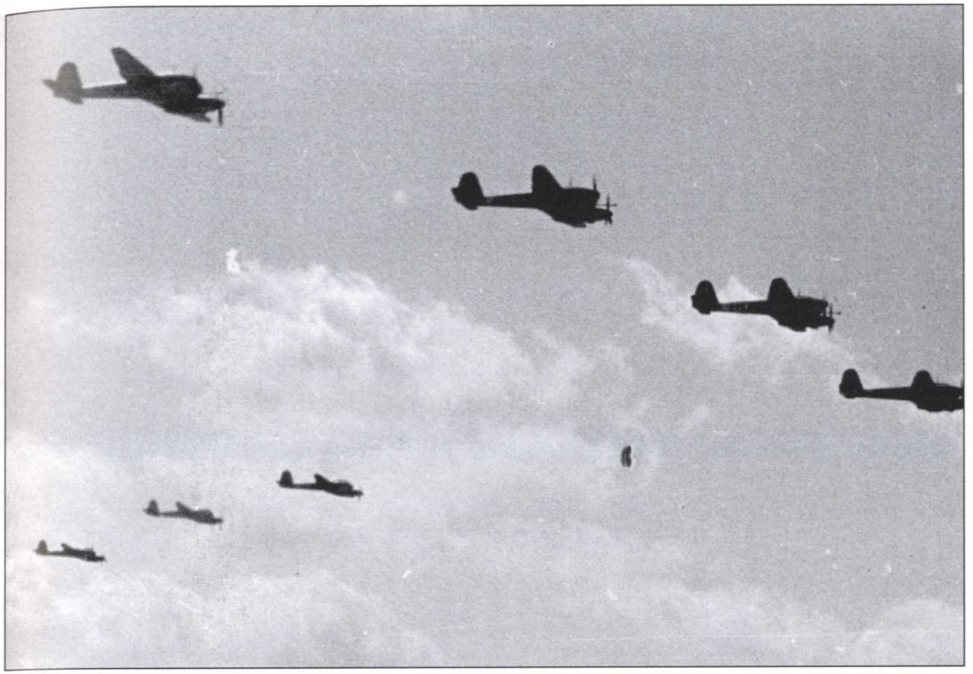




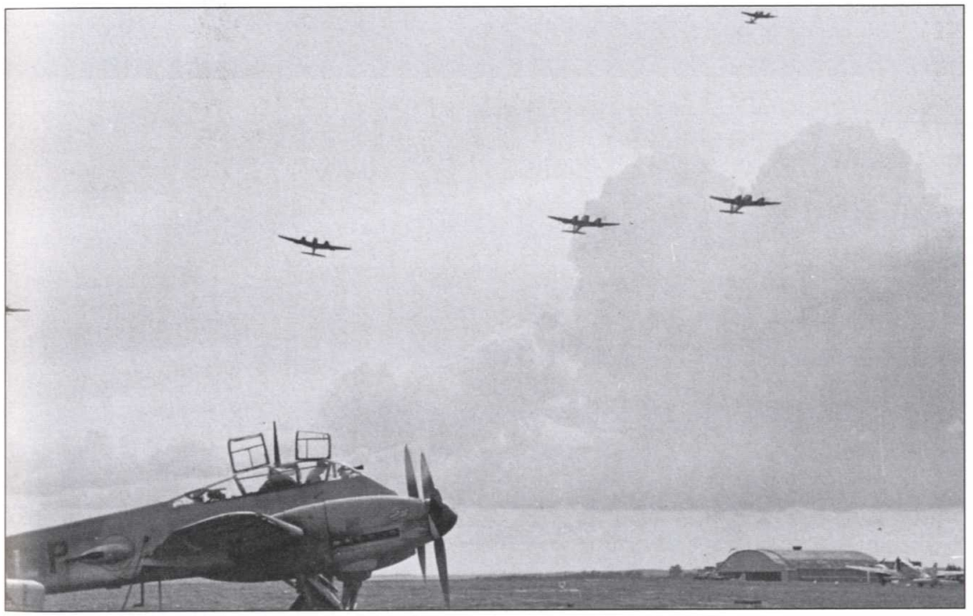
Me 410 fitted with a 50-mm converted tank gun in the nose, pulled away after delivering an attack on a US bomber formation.

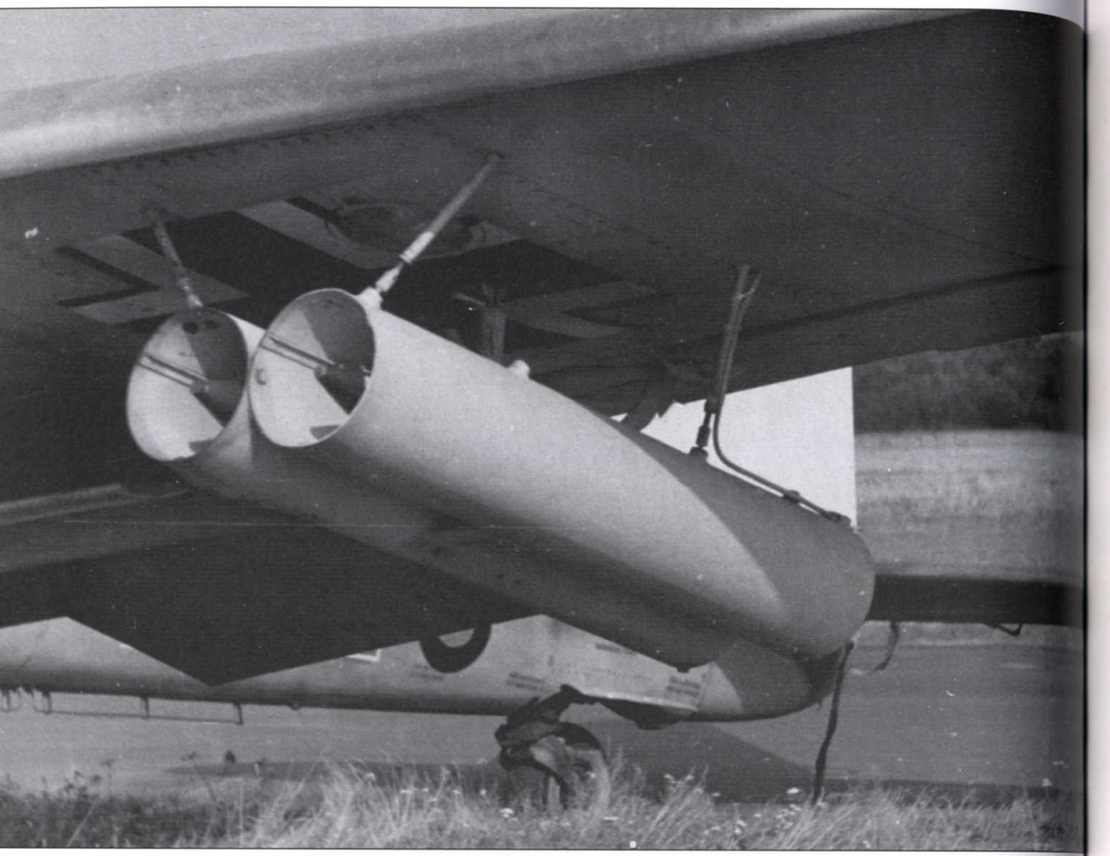


Stylised wasp insignia on the nose of a Messerschmitt Me 410 bomber destroyer, indicting that the aircraft belonged to Zerstörergeschwader 1 (ZG 1).



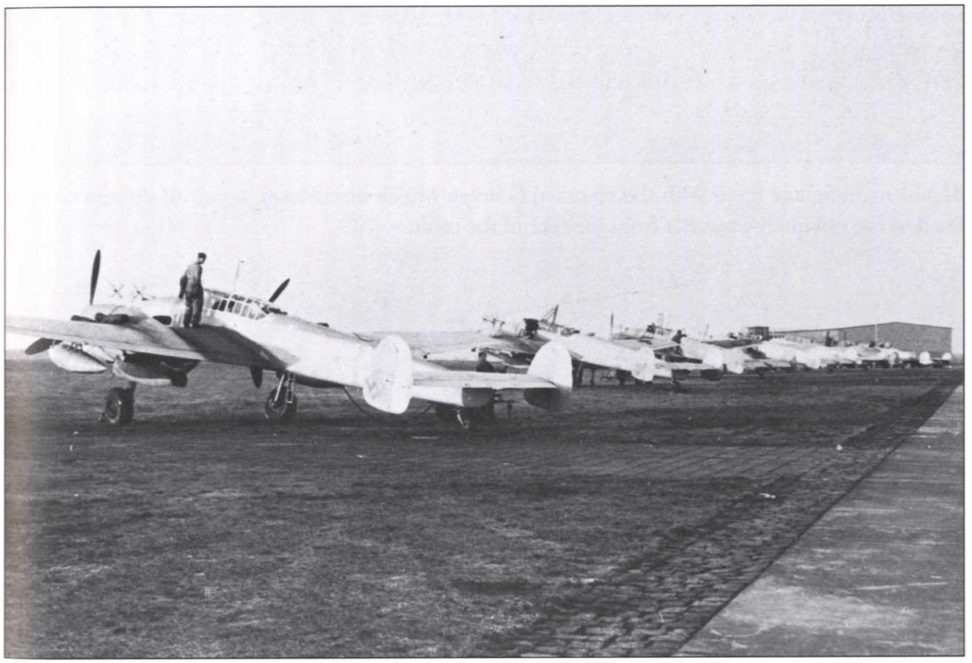
Me 410 bomber-destroyers of II./ZG 26.

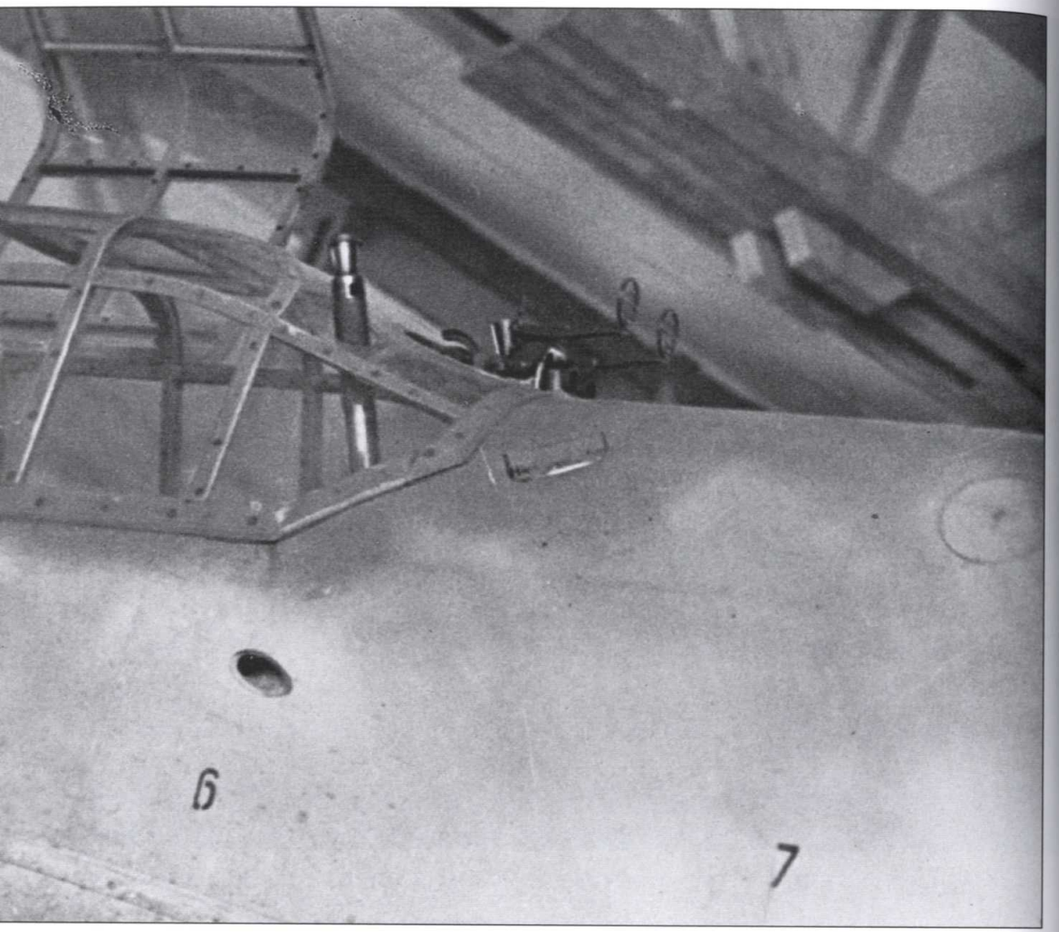




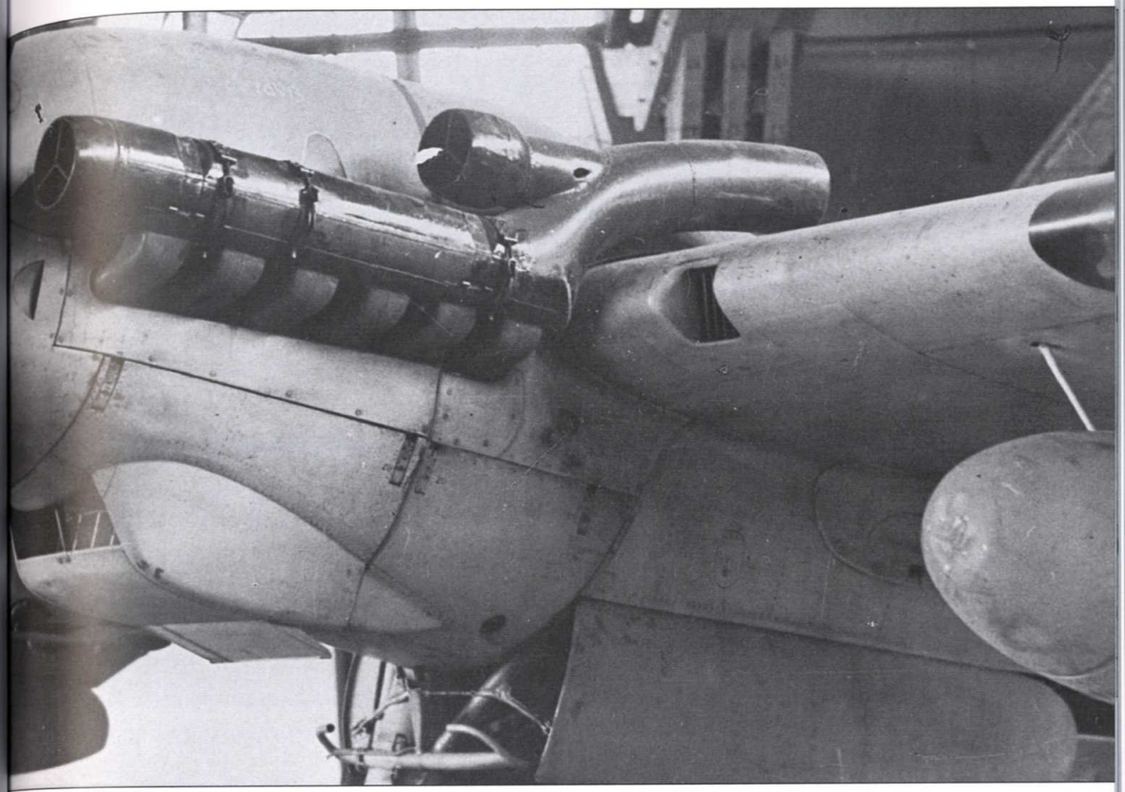
Close-up of 21-cm rocket launchers, fitted to an Me 410.

Bf 110 night-fighters of IIIrd Gruppe of Nachtjagdgeschwader 5 (III.NJG 5) operating from Königsberg/Neumark in the summer of 1943. Wolf





Bf 110 night-fighter fitted with the so-called Schräge Musik installation, a pair of 20-mm cannon fixed to fire obliquely upwards from the rear of the cabin.

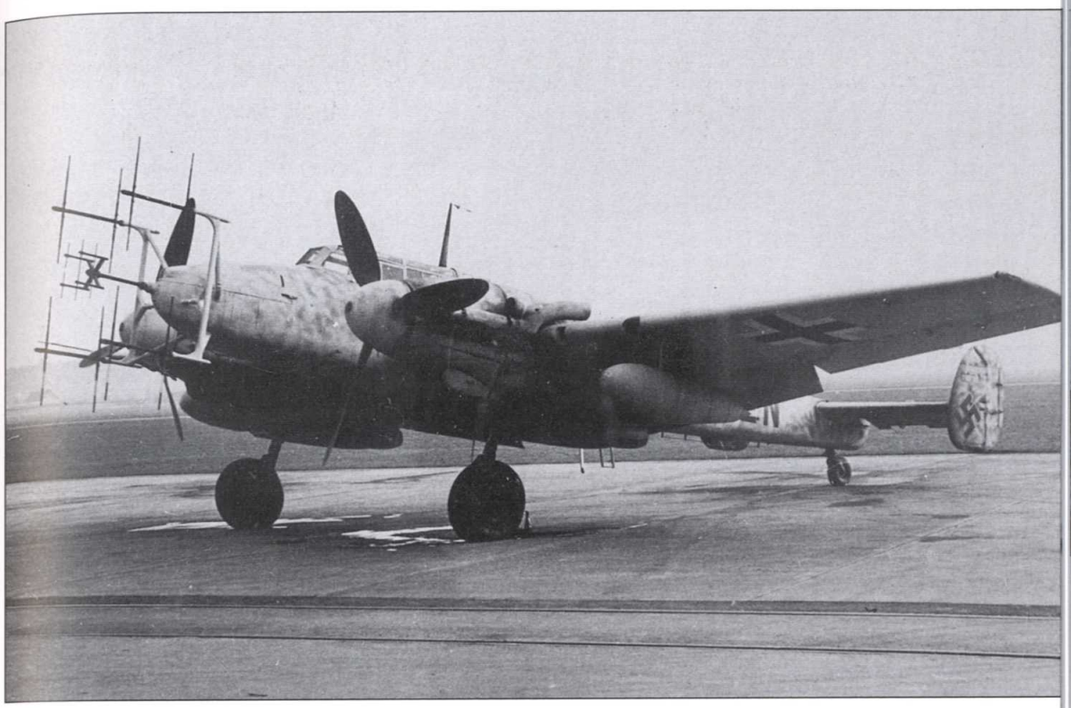


To reduce the glare from the engine exhausts, the Bf 110 night-fighter was fitted with hefty flame dampers. Although they were effective for their intended purpose, the installation reduced the aircraft's performance.

Fw 190 employed on *Wilde Sau* single-engined night-fighter operations, to attack RAF bombers illuminated over the target by searchlights or fires on the ground.

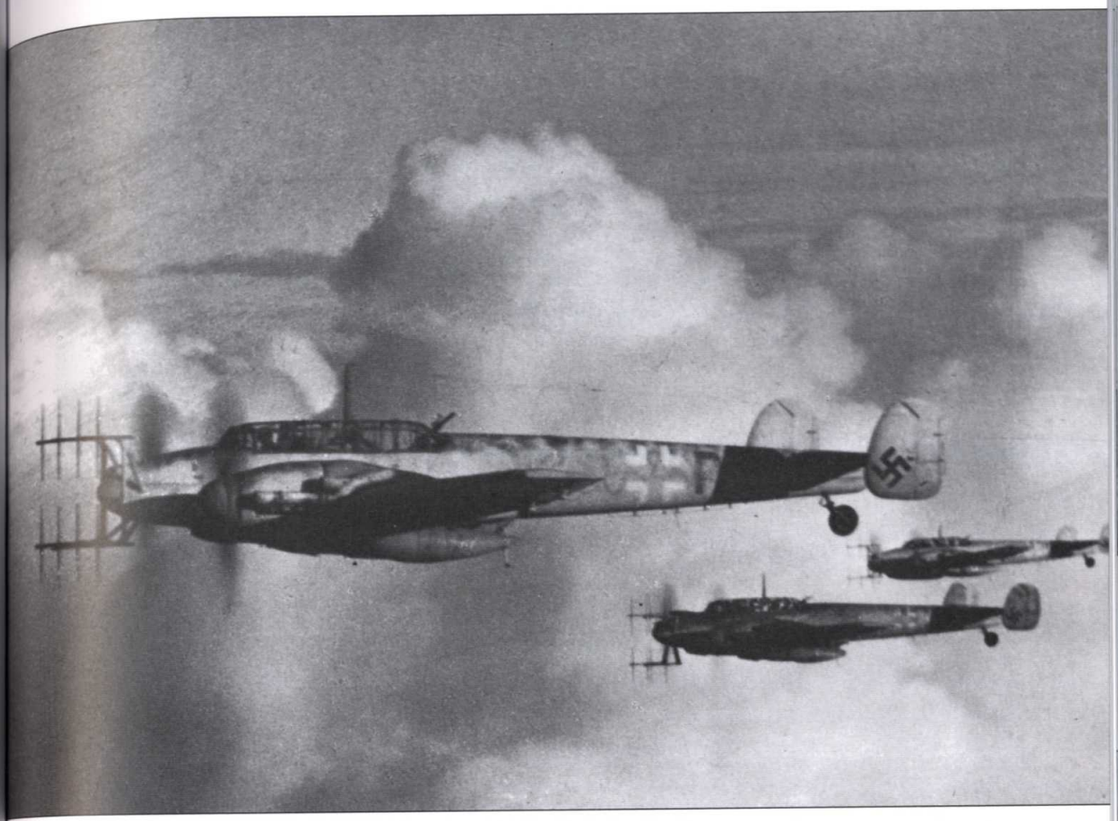
Oberst Hajo Hermann, originator of the *Wilde Sau* concept of operations.

Lancaster bomber seen from above, silhouetted against cloud illuminated by searchlights, photographed during a night attack on Berlin. The *Wilde Sau* night-fighters' task was to engage bombers illuminated in this way.

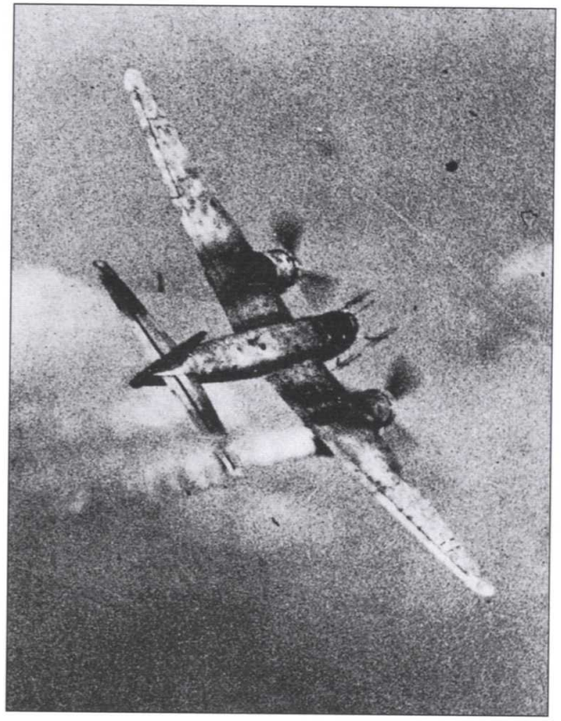


Bf 110G pictured early in 1944, with the large aerial array for the new SN-2 radar and a smaller array for the separate FuG 212 radar in the centre.

Bf 110Gs fitted with a later version of the SN-2 radar, with which the FuG 212 was no longer required. The aerial on the wing tip of one of the aircraft fed the 'Flensburg' homing system, enabling the night-fighter to home in on the emissions from the 'Monica' tail warning radar carried by RAF bombers.

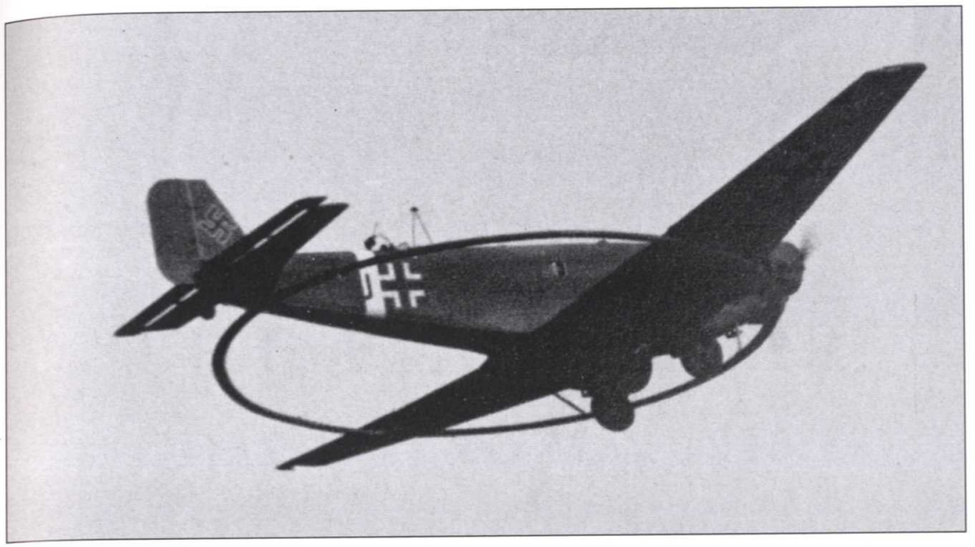


Bf 110G night fighters of NJG 5.

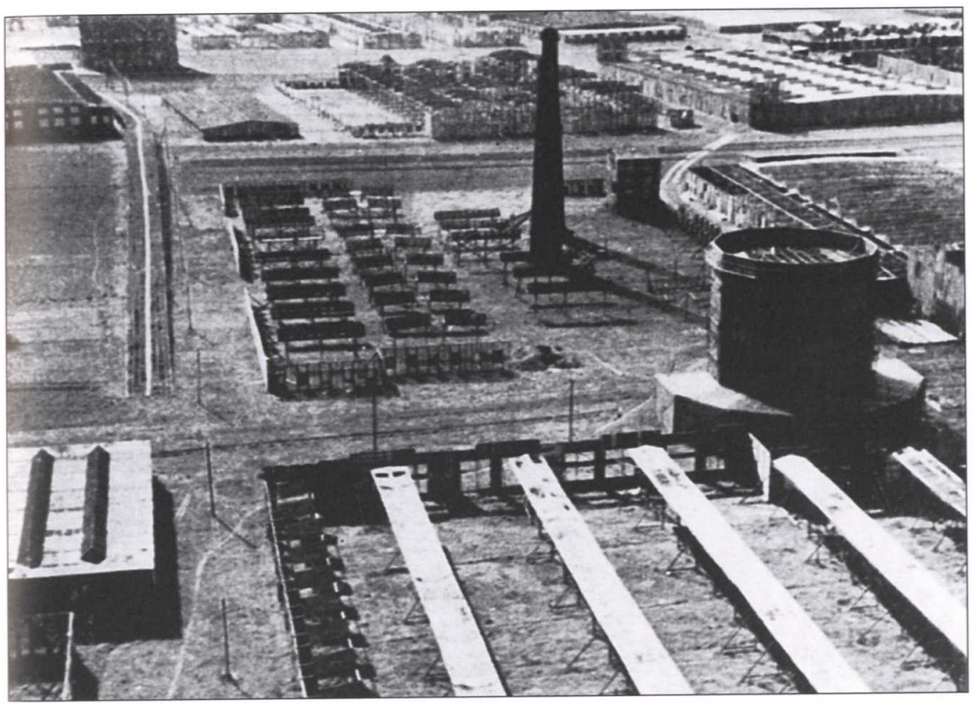


A Junkers Ju 88G fitted with SN-2 airborne interception radar.

During the large-scale daylight operations over Germany, night-fighters were often ordered into the air to fly behind US heavy bomber formations and finish off damaged aircraft. When they were caught by escorting fighters, however, these aircraft suffered particularly heavy losses. Here a Ju 88G night fighter is seen turning steeply to avoid fighter attack.



A Junkers Ju 52 fitted with a magnetic loop system for exploding magnetic mines from the air. via Schliephake

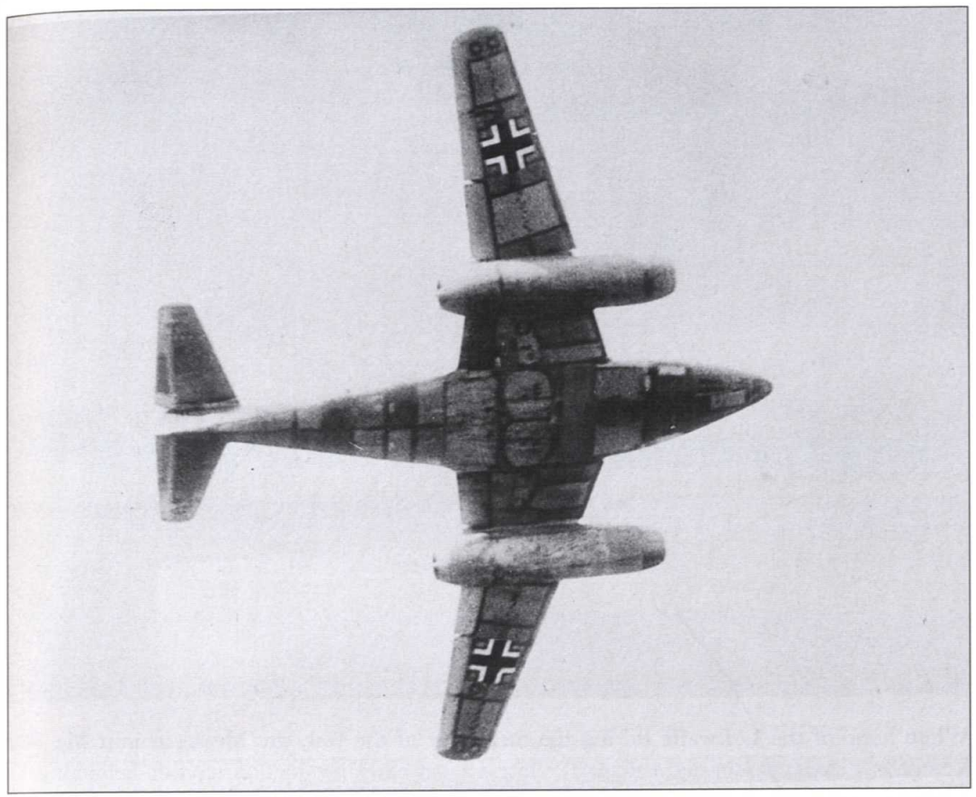


An important part of the German passive defensive system against night attacks was the erection of decoy targets. This elaborate example was built near the Skoda works near Pilsen in Czechoslovakia.

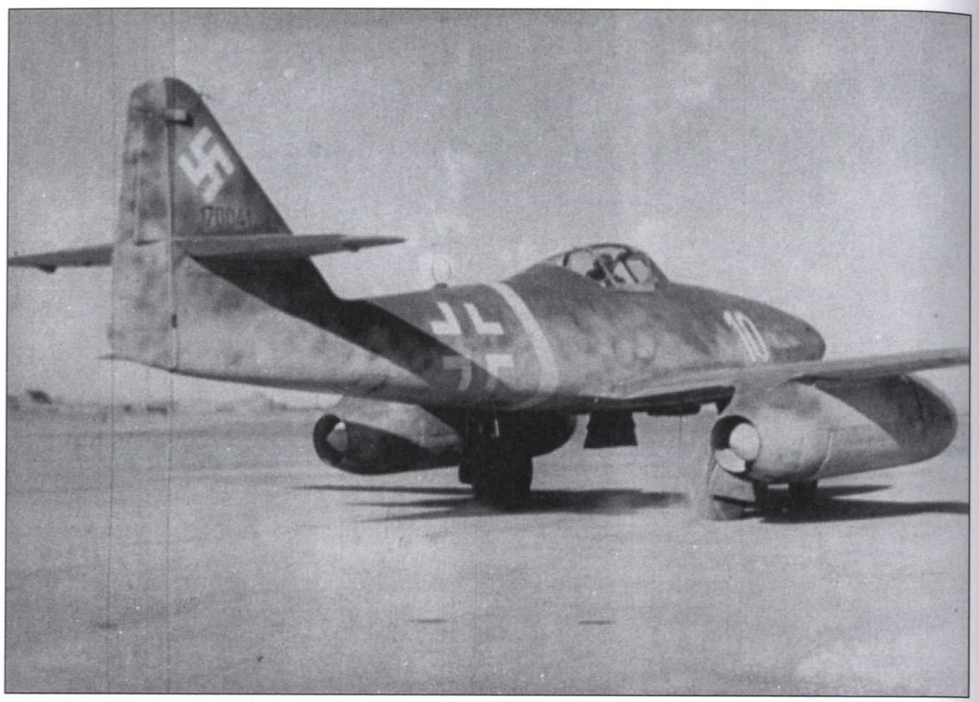
The Final Year

May 1944 to May 1945

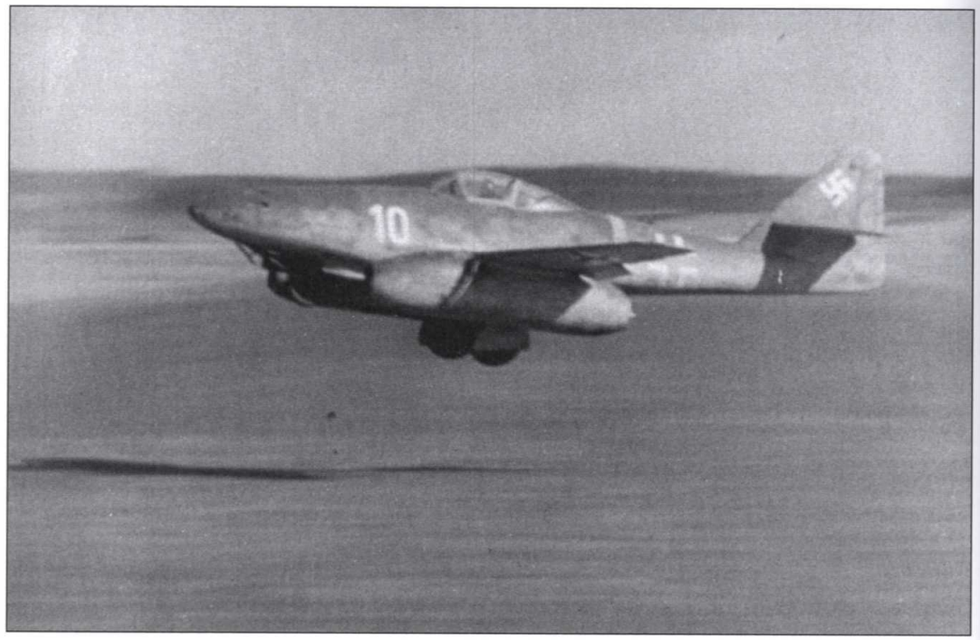
Three of the main players in the controversy regarding the operational use of the Me 262. Left, Adolf Hitler. Partially hidden by the latter is Generalfeldmarschall Erhard Milch, who was sacked from his post as head of aircraft production for failing to ensure that the Me 262 was modified for use as a fighter-bomber. Shaking hands with the Führer is General Adolf Galland, the Inspector of Fighters, who made unsuccessful attempts to get him to reverse his decision. via Ethell

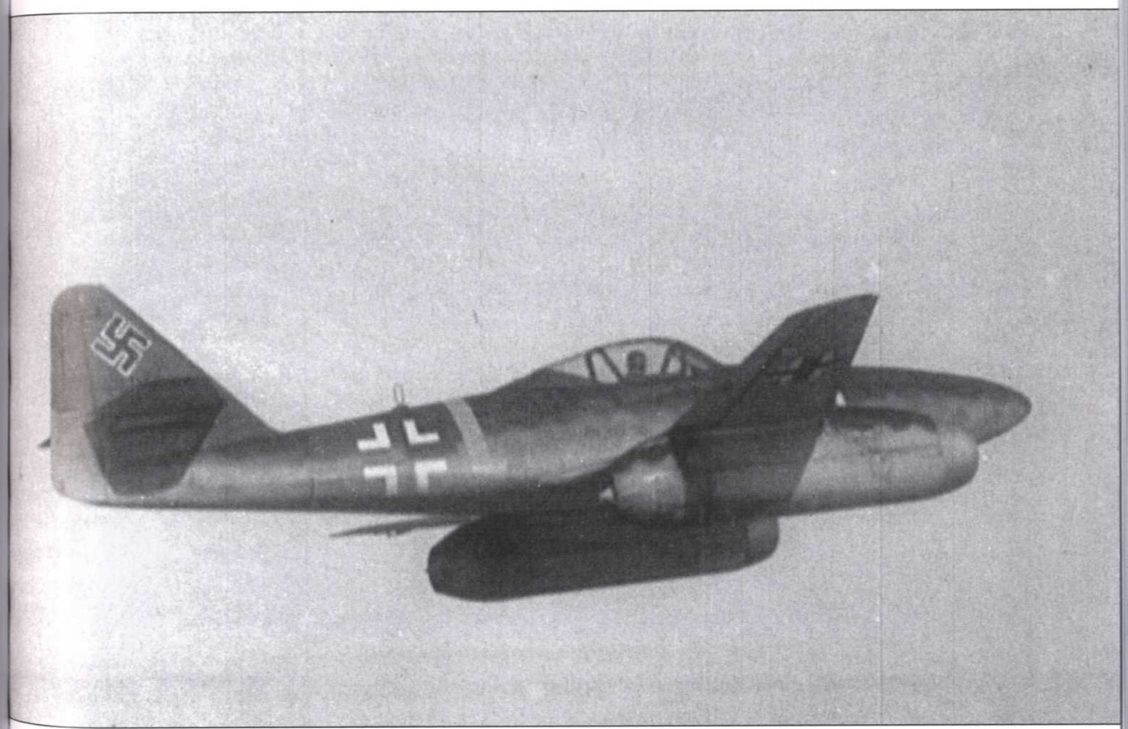


An Me 262 tips a wing to show the 18° sweepback angle of the wing. The fighter's design was frozen before the German wind tunnel work on the use of sweepback to delay the effects of compressibility, and was not influenced by it.

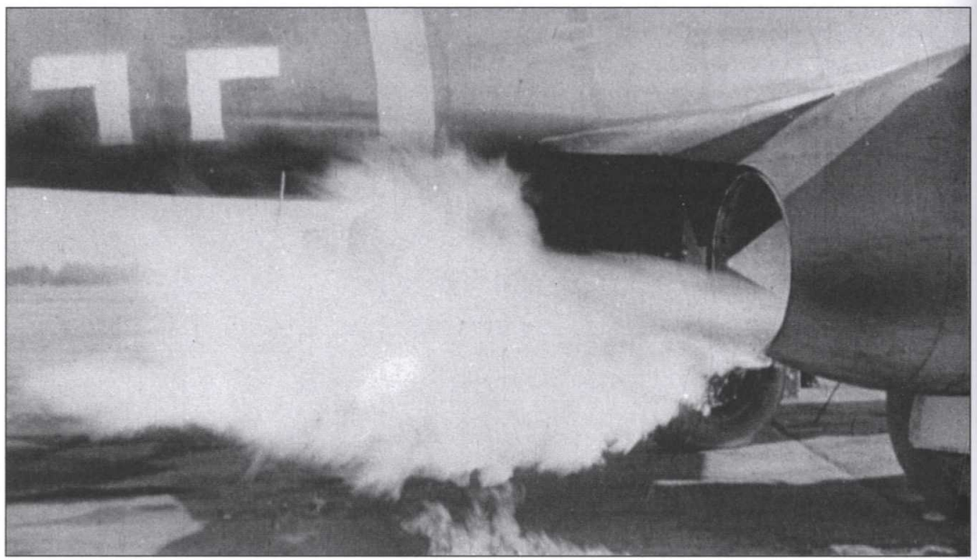


White hope of the Luftwaffe during the final year of the war, the Messerschmitt Me 262 jet fighter. These photographs depict 'White 10', an early production aircraft belonging to Erprobungsstelle 262 based at Lechfeld, and were taken in the spring or summer of 1944.



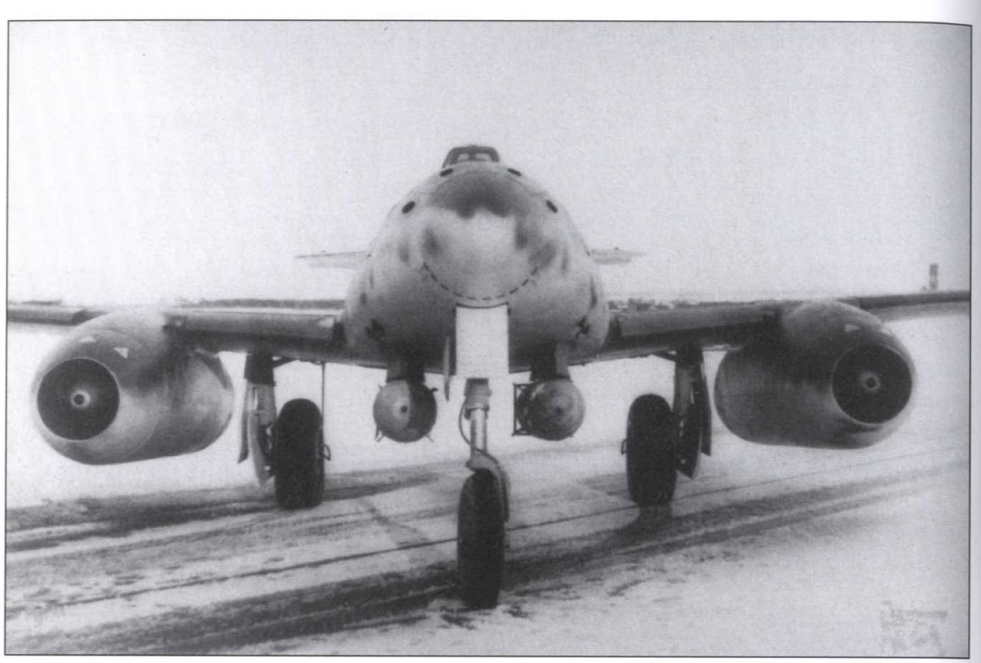


Ground crewman pulls the lanyard to start the small two-stroke piston engine built in the nose cone of the jet engine. The piston engine served as the starter motor for the Jumo 004 turbojet.

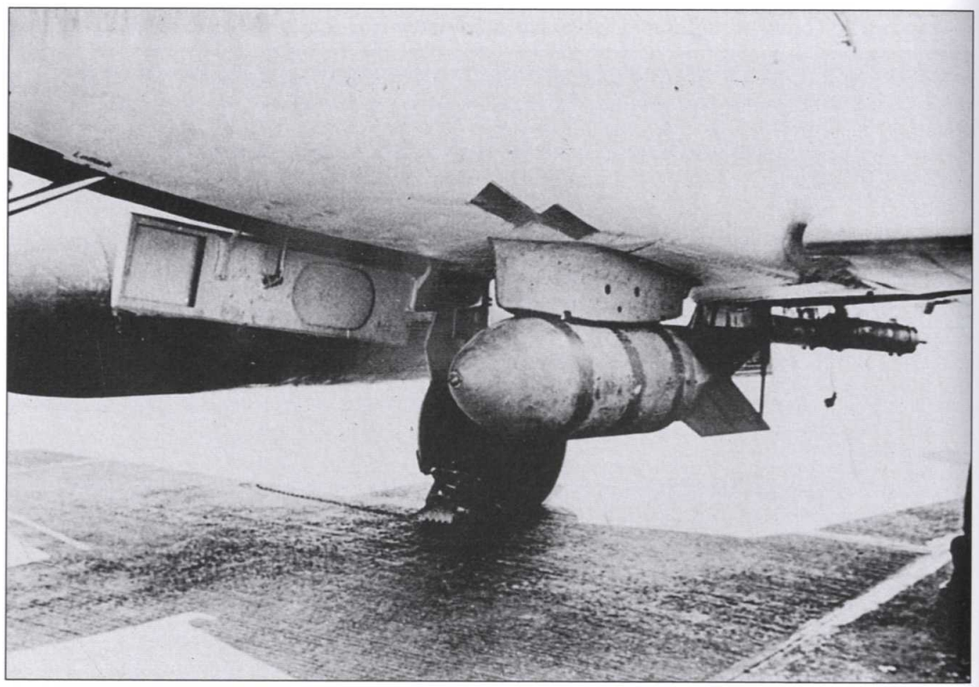


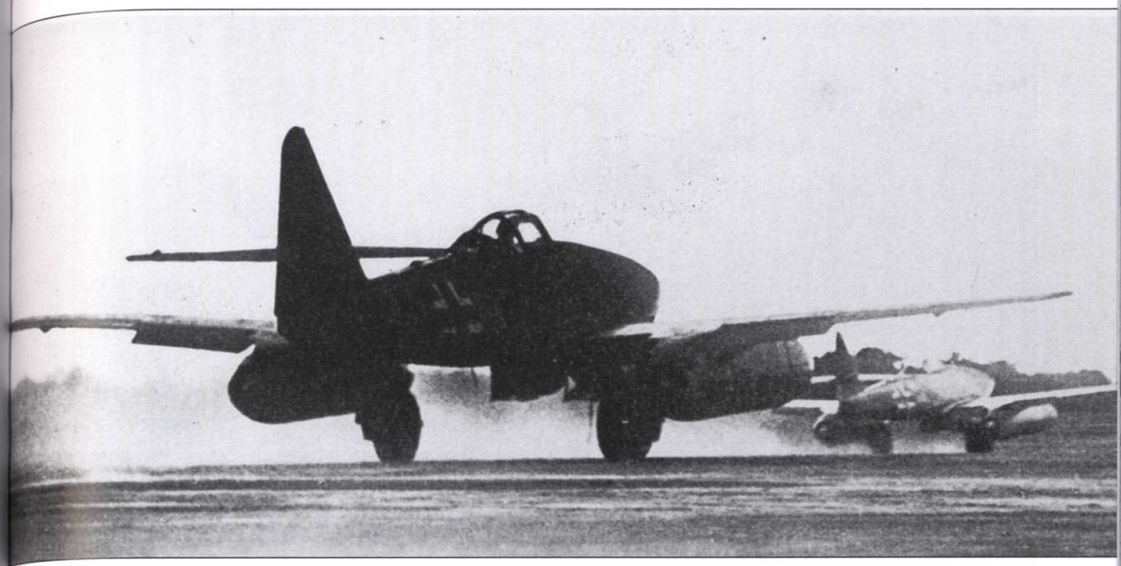
Flames gush from a Jumo 004, as the turbine builds up speed after the start. Although Junkers engineers strove to improve the engine's reliability and its running life, these problems limited the effectiveness of the Me 262 for the remainder of the war.

The two-cannon armament and bomb racks under the nose identify these aircraft as a Me 262 fighter-bombers of Kampfgeschwader 51. The aircraft on jacks is having the undercarriage retraction system tested.

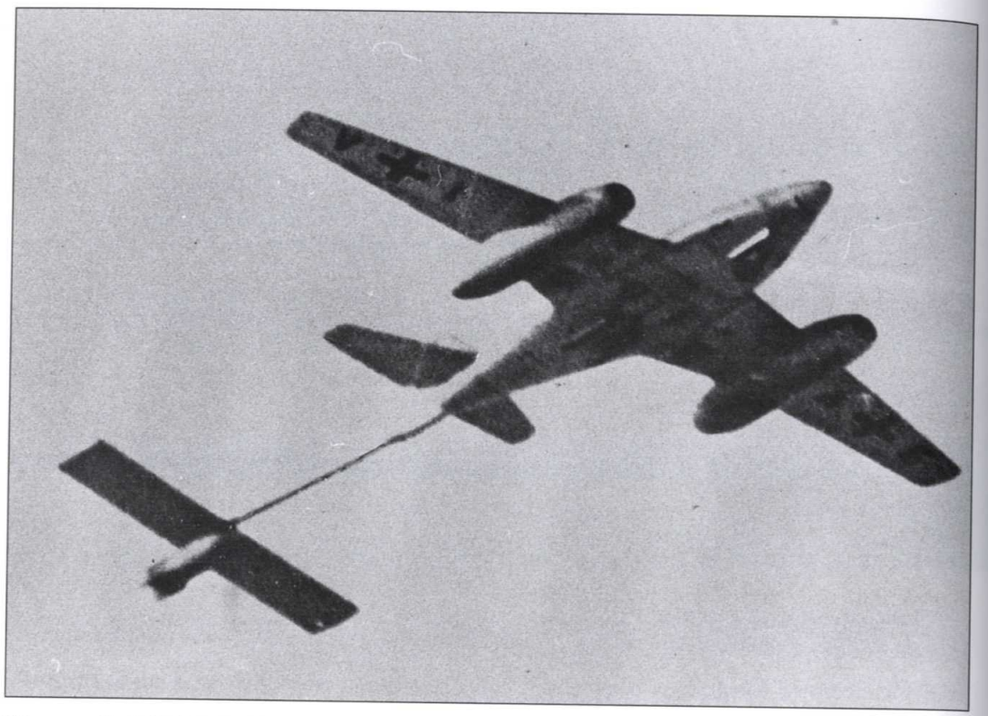


Close-ups of the bomb installation on the Me 262. The normal load carried by the aircraft was two 550-pounders. via Schliephake

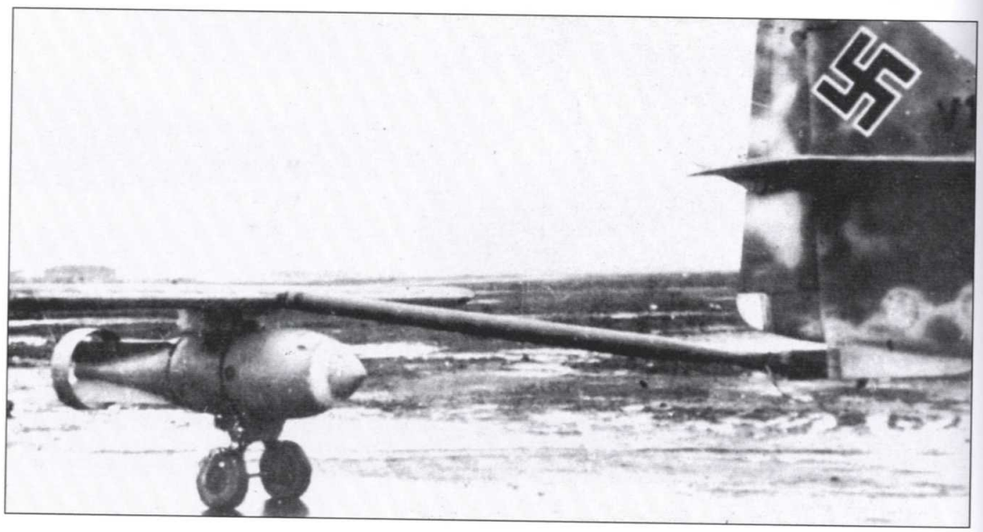


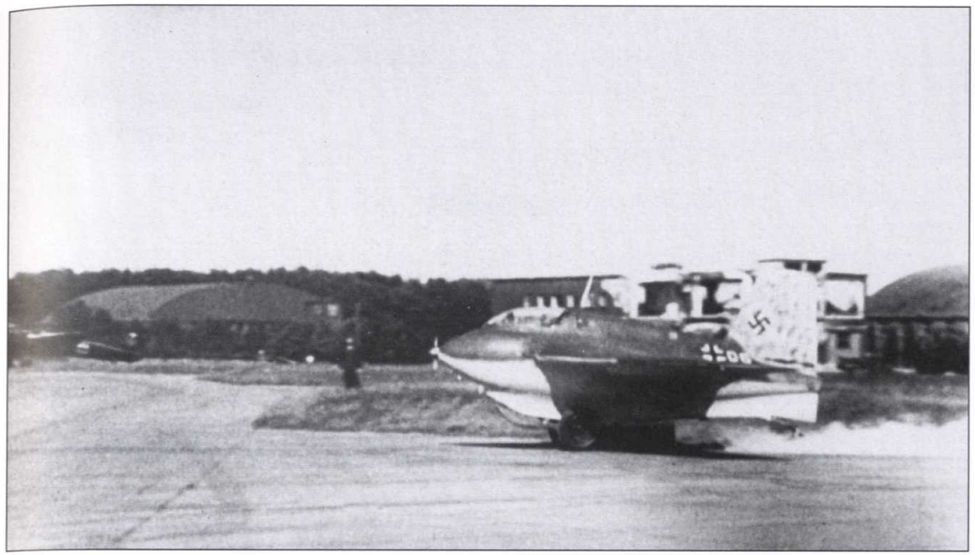


A pair of Me 262 fighter-bombers of KG 5 taking off to attack Allied positions.

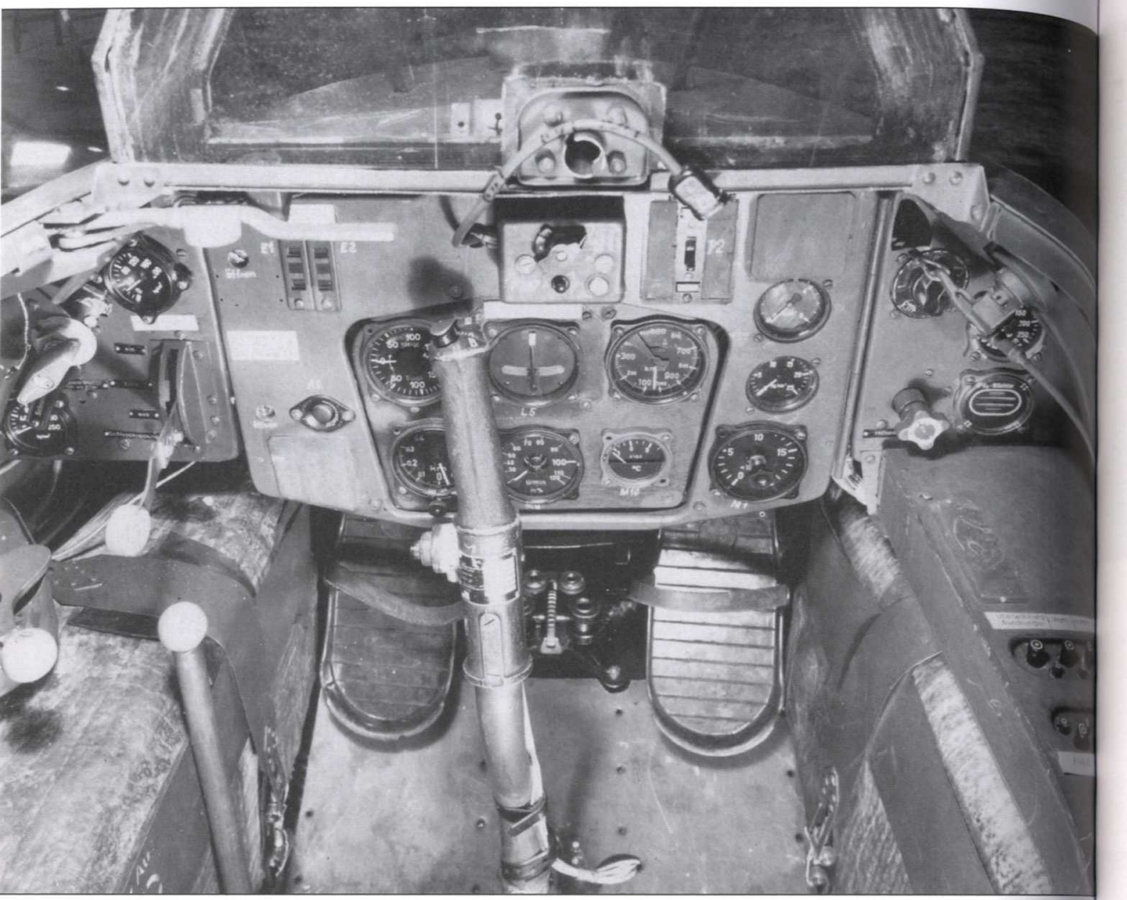


The so-called 'Deichelschlepp' (pole-tow) system was designed to enable the Me 262 to carry a 1,100-lb bomb mounted under a wing from a V.1 missile. After take-off the wheeled dolly fell away. The method imposed a severe penalty on the jet fighter-bomber's performance, however, and it was never used in action.





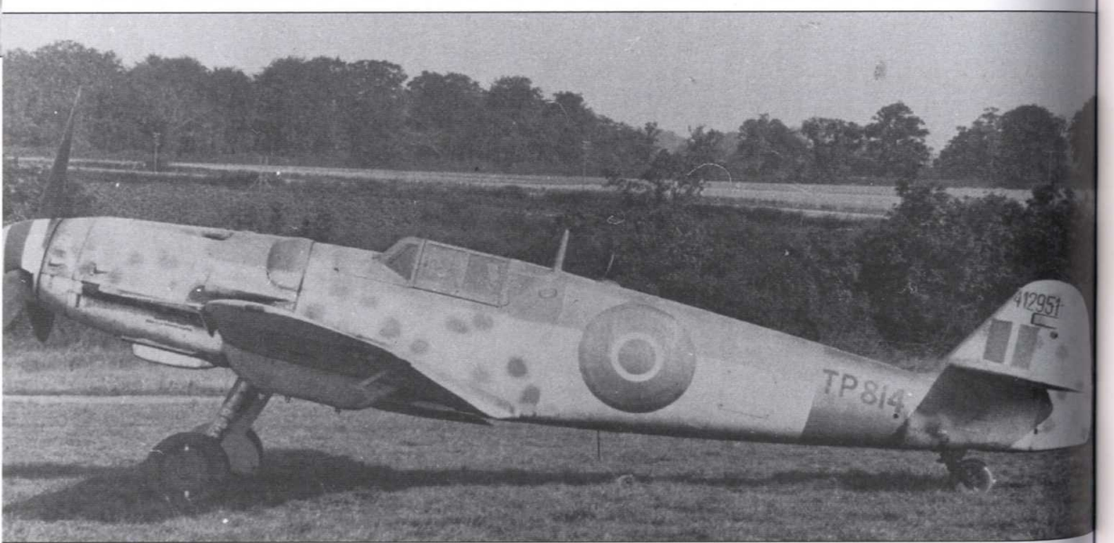
The rocket-propelled Messerschmitt Me 163 fighter was the first jet-propelled aircraft to enter operational service in any nation, in May 1944. Although it had a sparkling turn of speed and excellent climbing performance, the fighter had a pitifully short radius of action and that constrained its military effectiveness. These examples belonged to JG 400, the only combat unit to receive the type. via Ethell

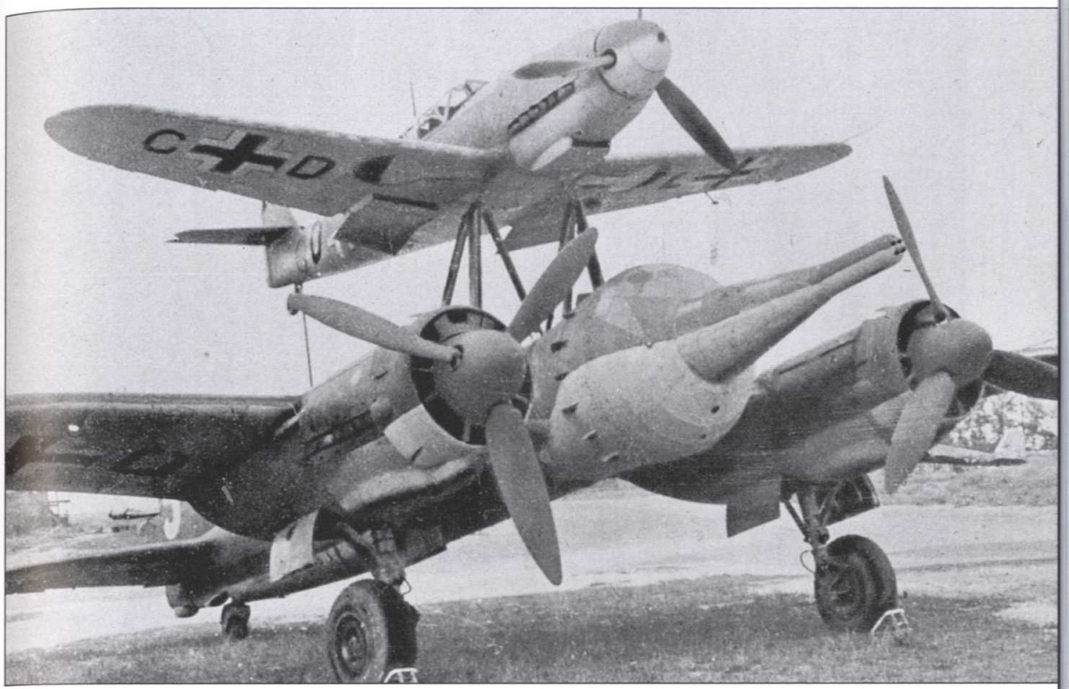


Instrument panel in the Me 163, showing the simple controls necessary for this rocket fighter.

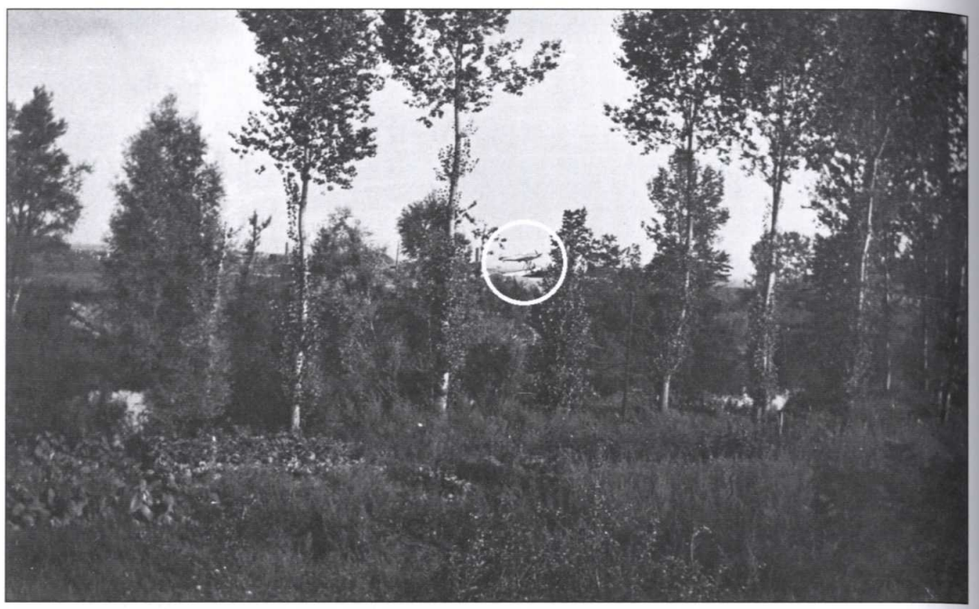
Due to the weight of Allied air attacks on airfields in France, Luftwaffe fighter units were forced to operate from field landing grounds. If the latter were located they came under immediate attack, and a unit's survival depended on its ability to camouflage itself effectively.

This Bf109G-6, still wearing the red fuselage band of the Reich Air Defence force, belonged to one of the units rushed to reinforce the defences of France after the invasion. On 21 July 1944 its pilot became disorientated in bad weather and made an unscheduled landing at the RAF airfield at Manston in Kent. The captured fighter took part in comparative trials against the Spitfire LF IX, the Spitfire XIV and the P-51C Mustang, before it was destroyed in a crash in the following November.





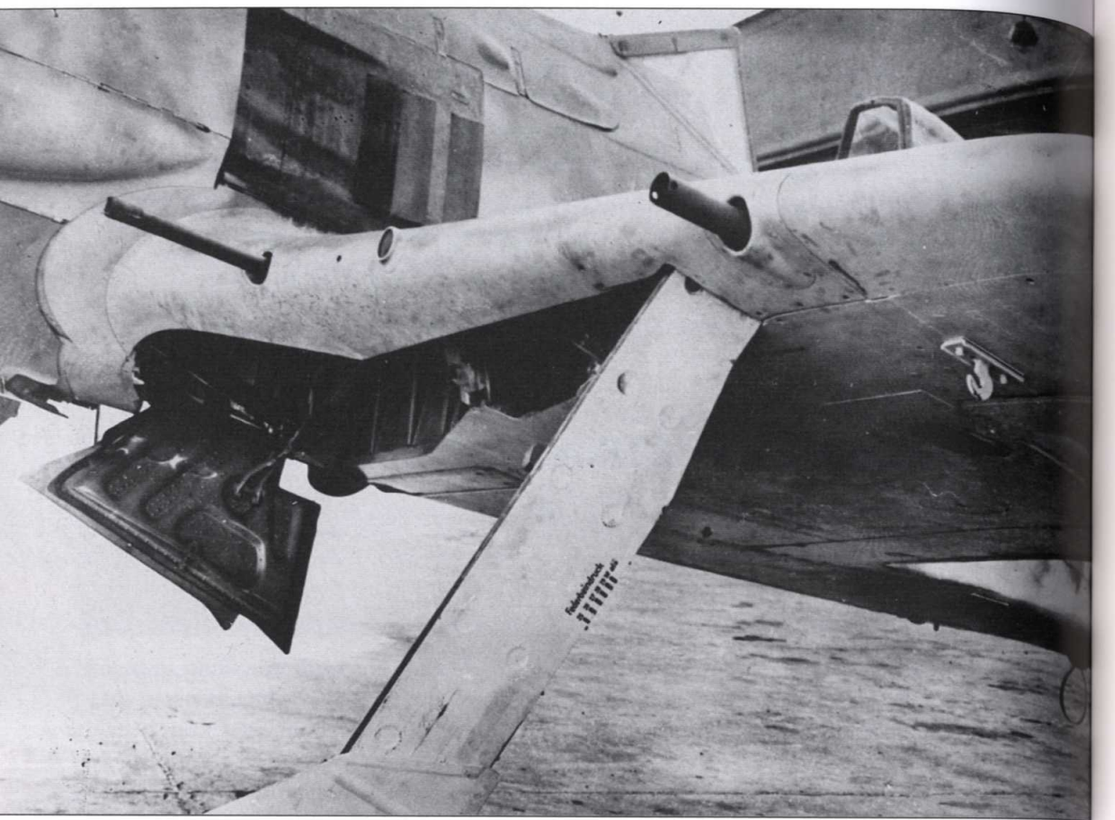
The Mistel comprised an unmanned Junkers 88 fitted with a 7,800-pound warhead in place of the crew compartment. The combination was flown by a pilot sitting in a Bf 109 (later an Fw 190) mounted rigidly on top of the bomber. The pilot aligned the combination on the target, switched in the bomber's automatic pilot and then fired explosive bolts to release the lower component which continued straight ahead until (hopefully) it impacted on the target. Although the weapon was used in action in small numbers, there is no record of it having secured any noteworthy success.



A remarkable photograph taken through trees surrounding the airfield at St Dizier by a member of the French Resistance, showing a Mistel at one of the dispersal points.

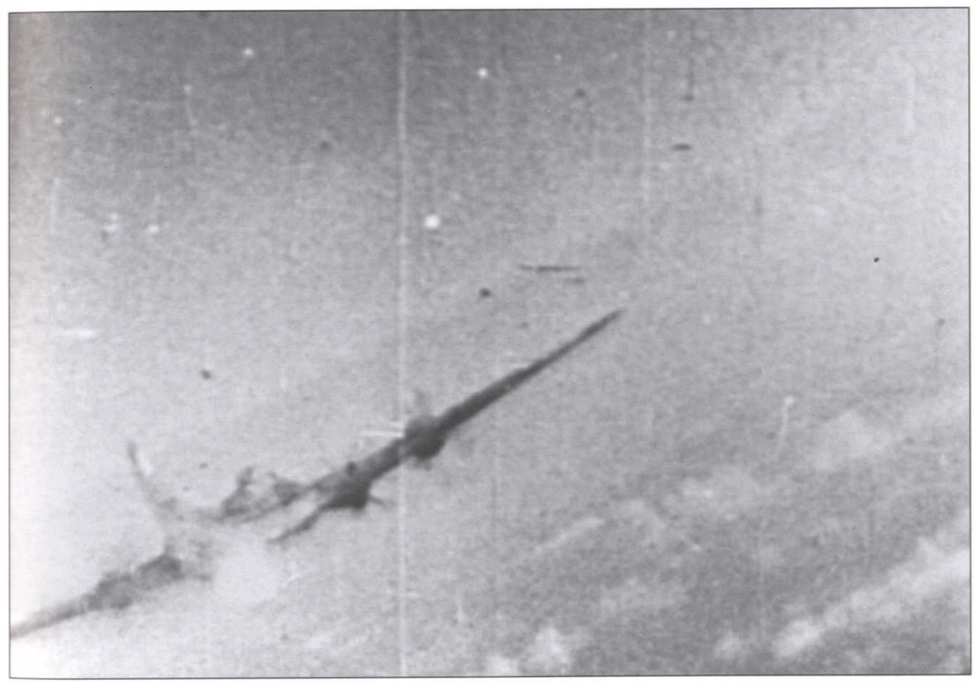
In the late spring of 1944 the Luftwaffe introduced the so-called Sturmgruppen, units operating Fw 190s fitted with additional armour and two 30-mm cannon. Flown by volunteer pilots, these aircraft were to hold tight formation and close on US heavy bomber formations from behind, braving the heavy return fire. From a range of about 100 yards they would open a withering fire on their prey. Unteroffizier Bösch of IV./(Sturm) JG 3 is seen boarding his aircraft at Schongau. Note the large slab of toughened glass fitted on the side of the canopy, indicating that this was one of the modified aircraft.

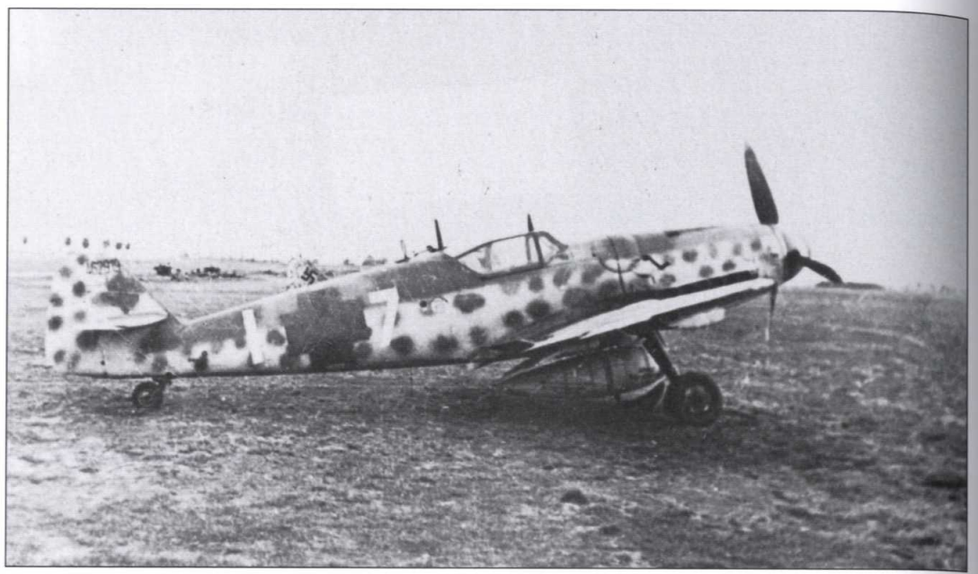
An Fw 190 of II/(Sturm) JG 300.



Close-up of the wing of a Sturmgruppe Fw 190, showing the stubby barrel of the 30-mm cannon. The magazine for each weapon held only fifty-five high explosive rounds, hence the need to close to short range before opening fire with these low velocity weapons.

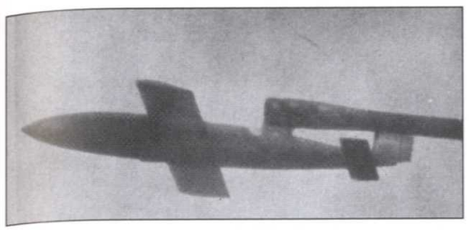
A B-17 and a B-24 seen under attack from short range by Sturmgruppe Fw 190s. When these aircraft were able to reach a firing position behind a bomber formation they often carried out great execution.



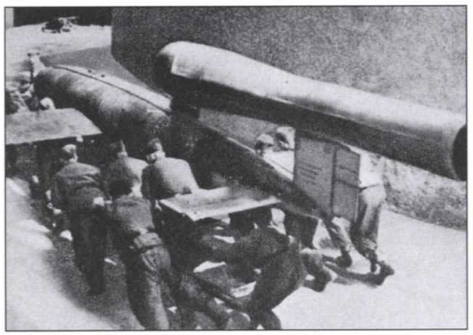


Each Sturmgruppe operated with two Gruppen of lightly armed Bf 109G fighters, to escort it through the screen of US escort fighters. This aircraft belonged to III./JG 3, assigned to the escort of IV.(Sturm)/ JG 3. Romm

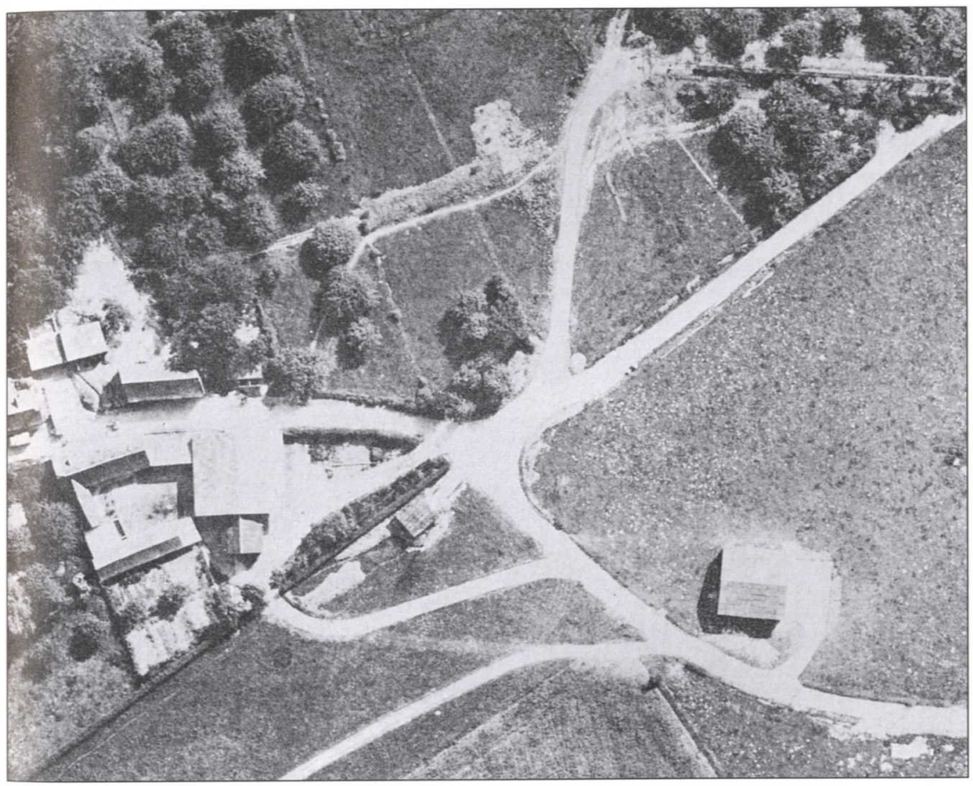
Three successful Sturmgruppe pilots. On the right is Oberst Walther Dahl, commander of JG 300 and a leading exponent of these tactics. In the centre Hauptmann Wilhelm Möritz, commander of IV.(Sturm)/JG 3. On the left is Leutnant Oskar Romm, also from that unit, who was credited with the destruction of three B-24s during the Sturmgruppe action on 27 September 1944. Romm



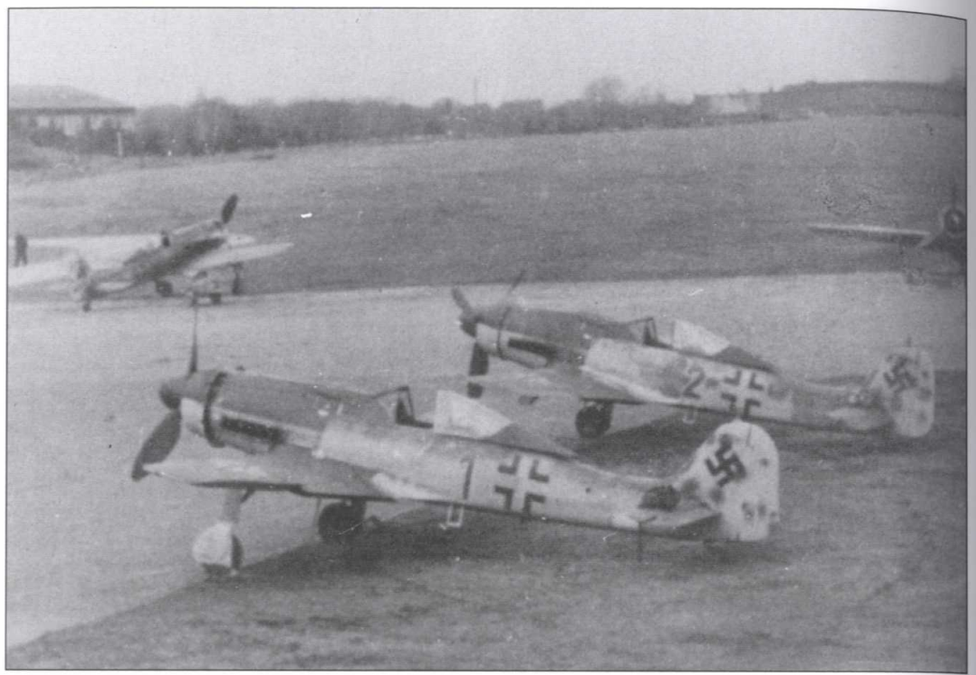
V.1 flying bomb pictured shortly after launch.



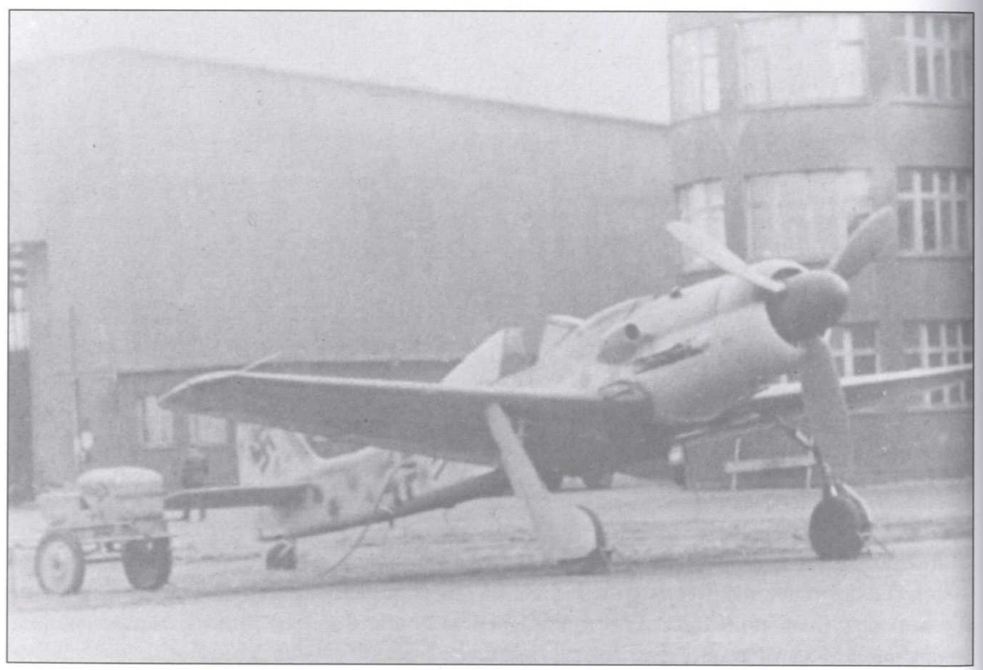
V.1 being manhandled on to the launching ramp.

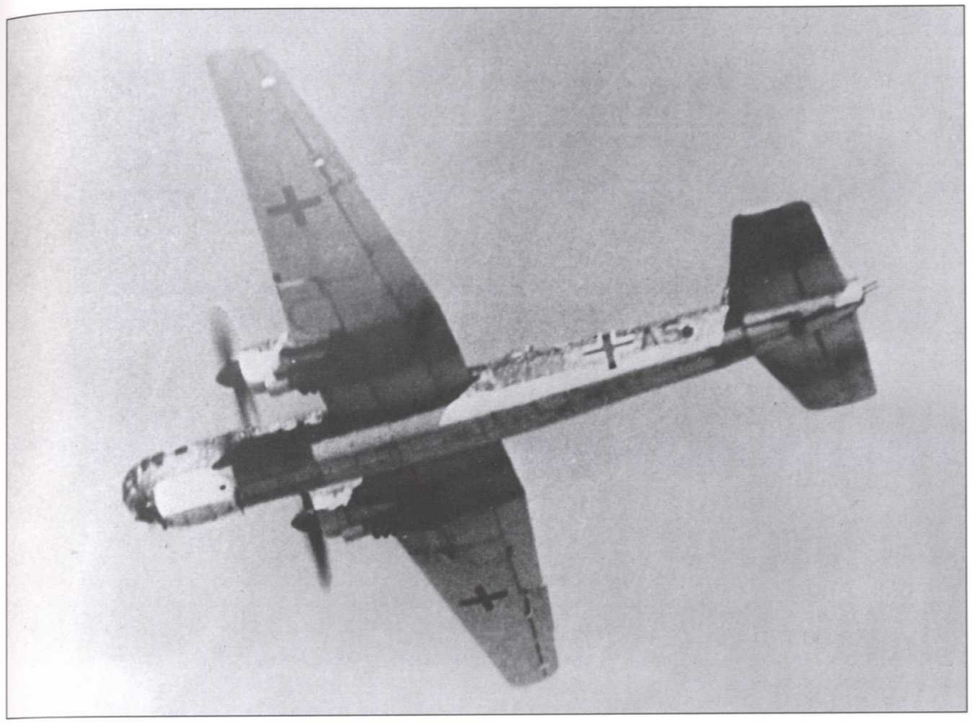


Camouflaged V.1 launching site at Vignacourt near Abbeville in France, photographed in June 1944. The only 'give-away' among the apparently innocuous-looking cluster of farm buildings are the launching ramp in the top right corner, aligned on London, and the similarly aligned compass setting building at the lower right.

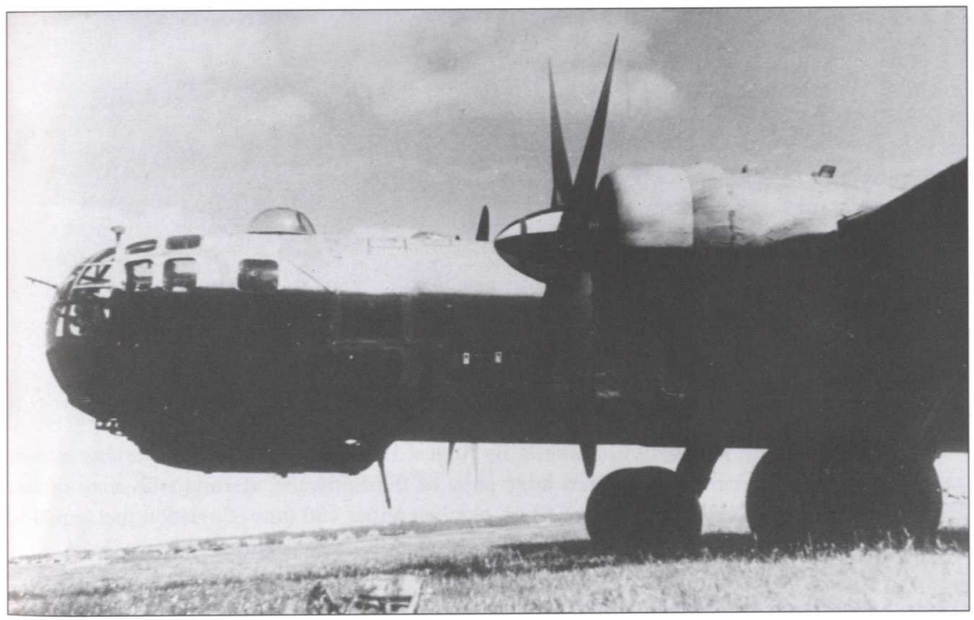


The Focke Wulf Fw 190D entered service in the summer of 1944. This sub-type of the famous fighter was fitted with the Jumo 213 in-line engine, resulting in lengthened nose contours. The performance of the Fw 190D was similar to that of the best Allied fighters of the late war period.

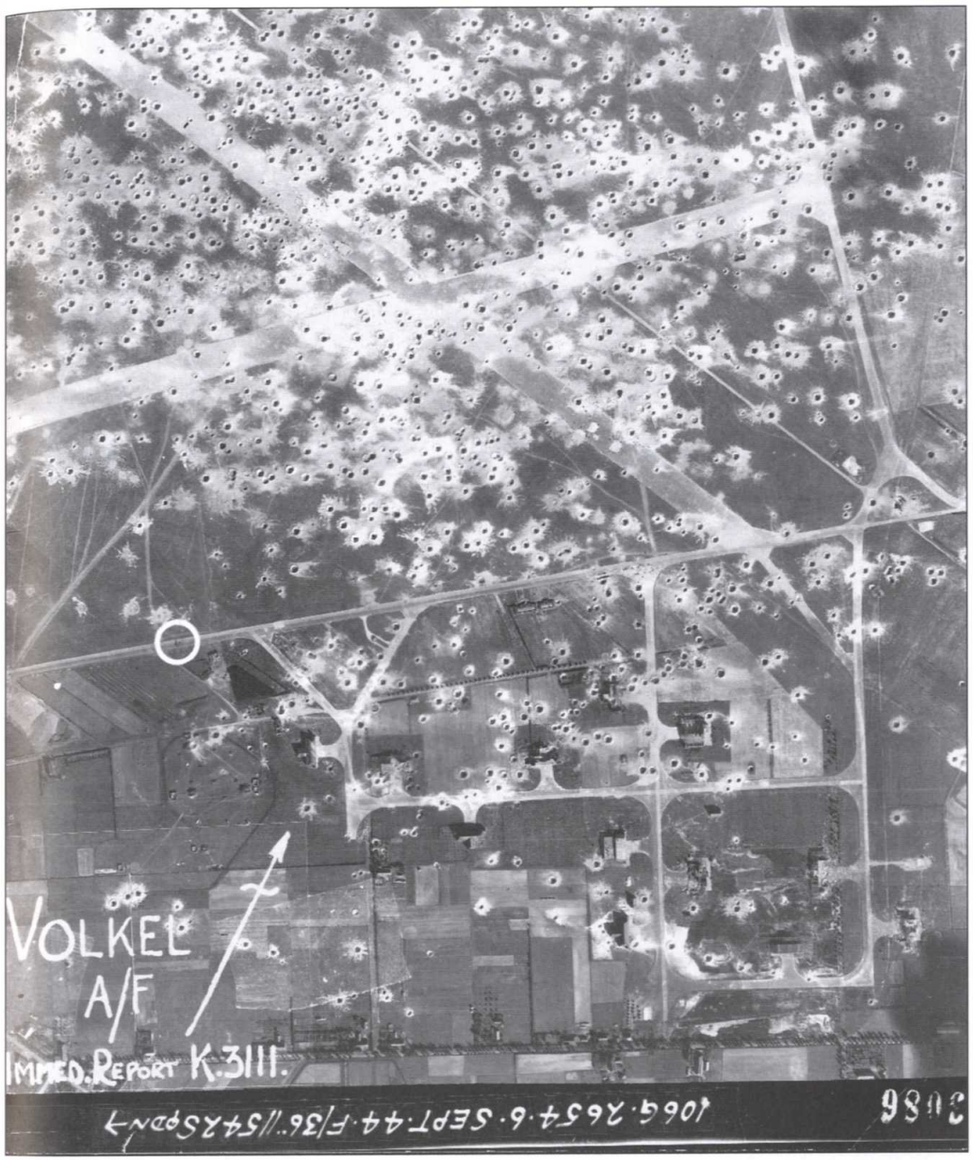




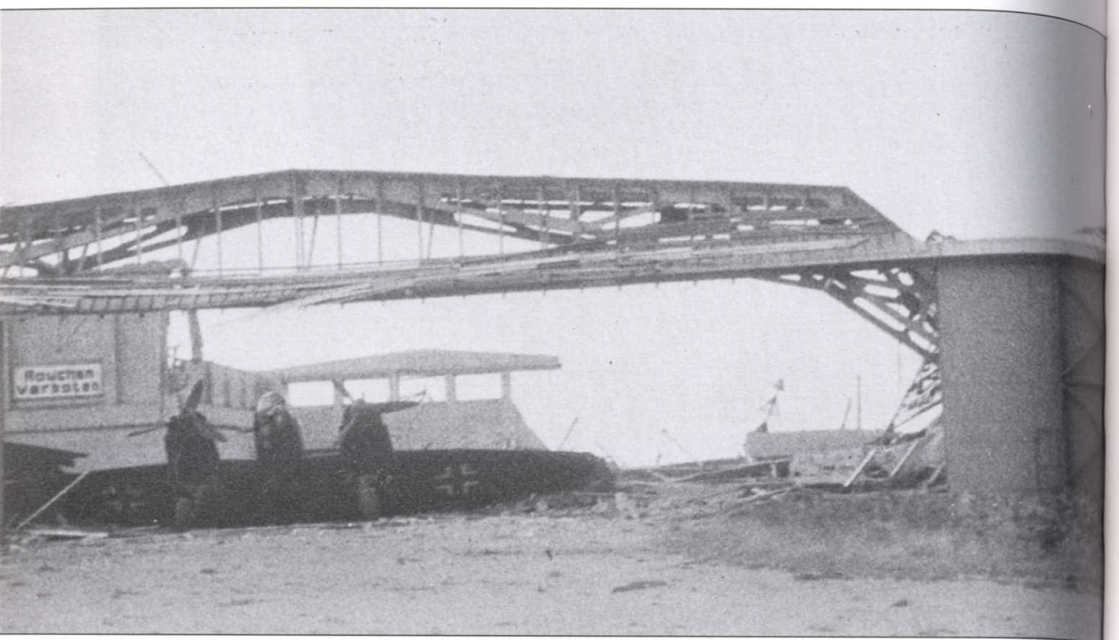
In the summer of 1944, KG 1 went into action in full Geschwader strength with He 177 heavy bombers. The unit operated for a few weeks on the Eastern Front, before the fuel famine brought a rapid end to its activities. von Riesen



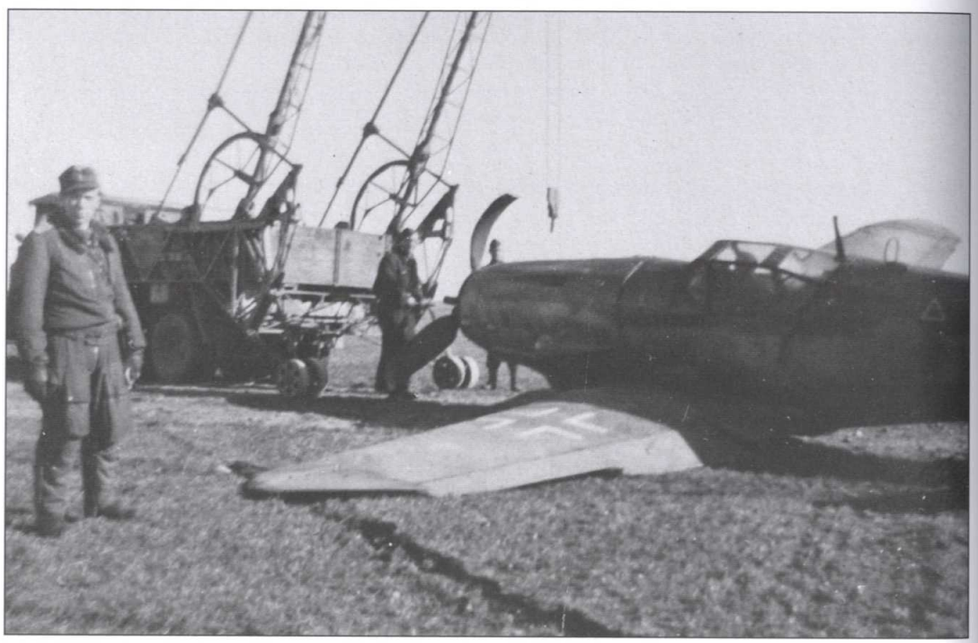
Oil refinery at Harburg wrecked by air attack. By August 1944 the Allied strategic bomber attacks had caused a fuel famine that paralysed large parts of the Luftwaffe, starting with the bomber force. An attack by the eighty He 177s of KG 1 required about 480 tons of aviation fuel, equal to an entire day's production from the hard-hit German oil industry in August 1944.



The airfield at Volkel in Holland pictured after a daylight attack on 3 September 1944 by more than a hundred Lancaster bombers. Despite severe damage to the facilities, aircraft could still leave the base. Some bomb craters had been filled in, then painted to look as if they were still there. An aircraft (circled) is seen taking off from the long straight taxiway across the centre of the photograph.

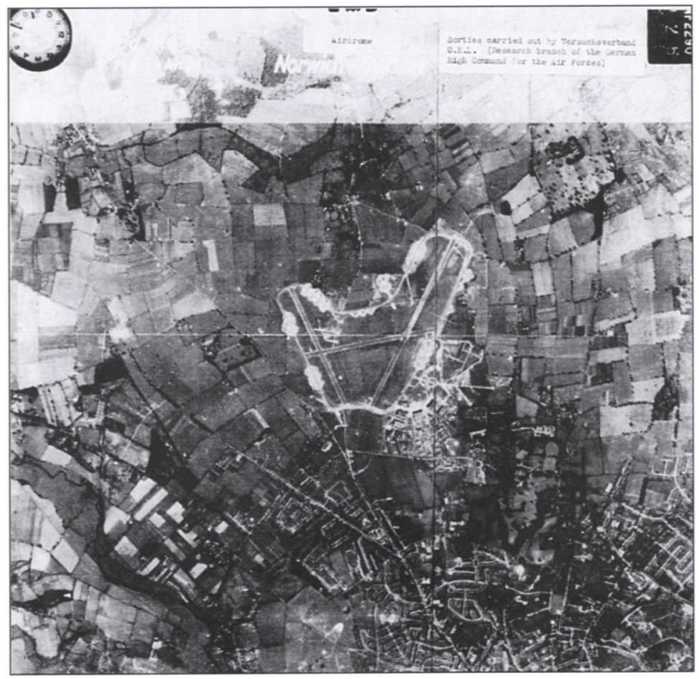


Ju 88 wrecked in one of the hangars at Volkel. Sommer

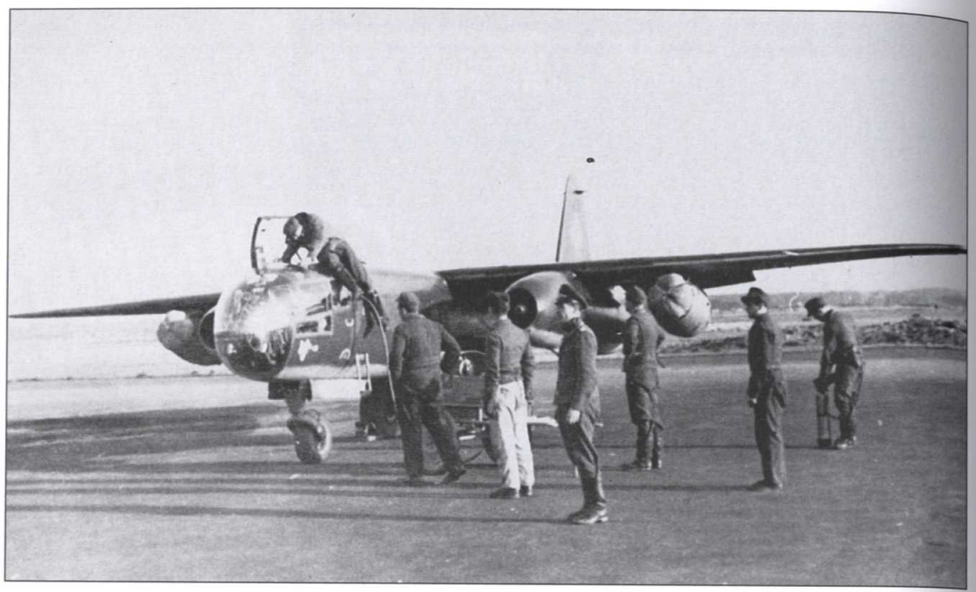


In time of war a salvaged and repaired aircraft is as important as a new one. Here a Luftwaffe salvage crew picks up a late model Bf 109G after it had been forced down during an air combat over Denmark.

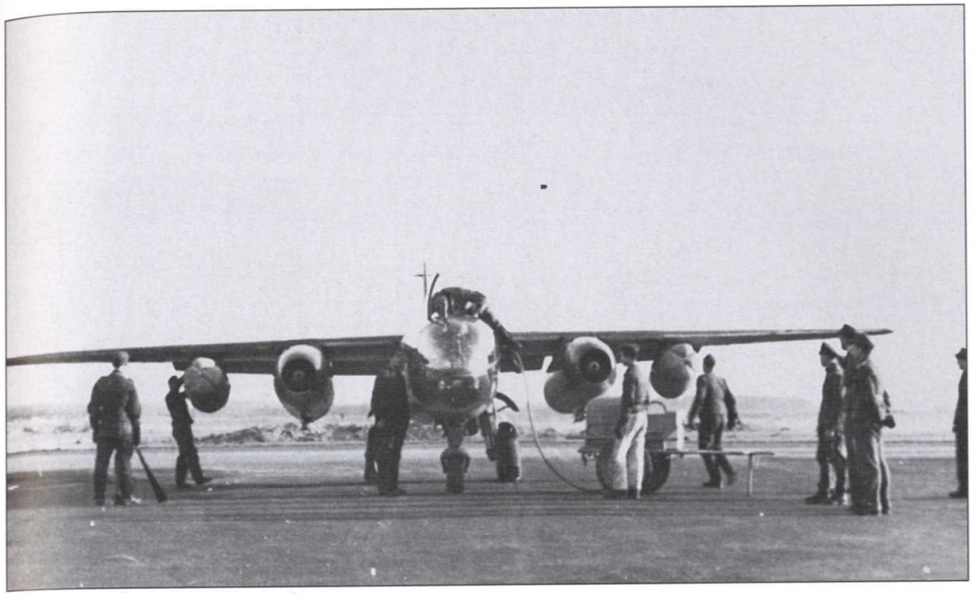
Cherbourg harbour, photographed from an Ar 234 in August 1944.



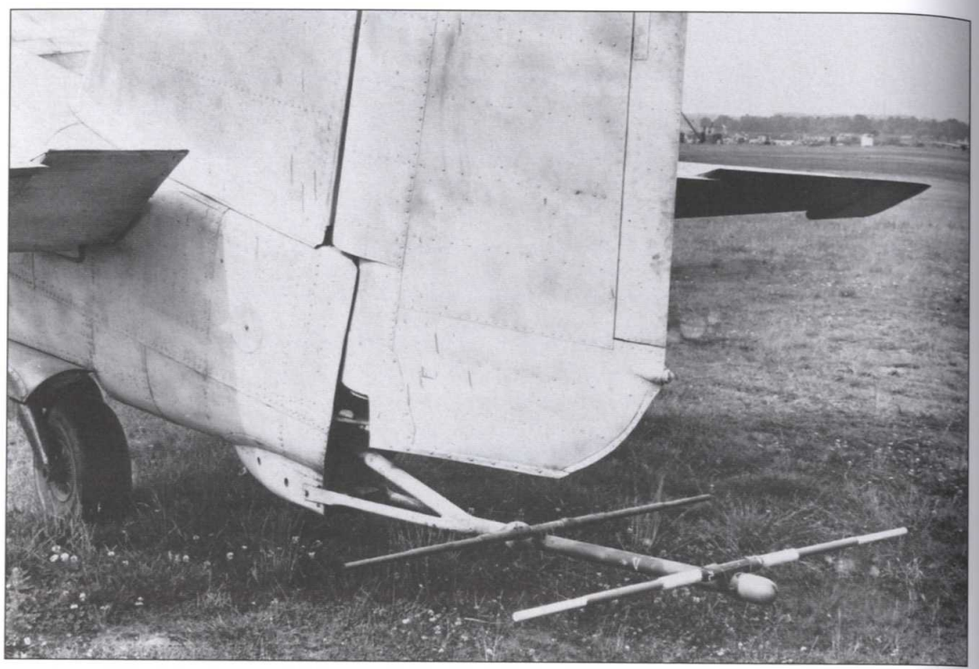
The airfield at Glatton near Norwich, home of the B-24s of the 458th Bomb Group, photographed from an Ar 234 of Kommando Sperling on 11 September 1944.



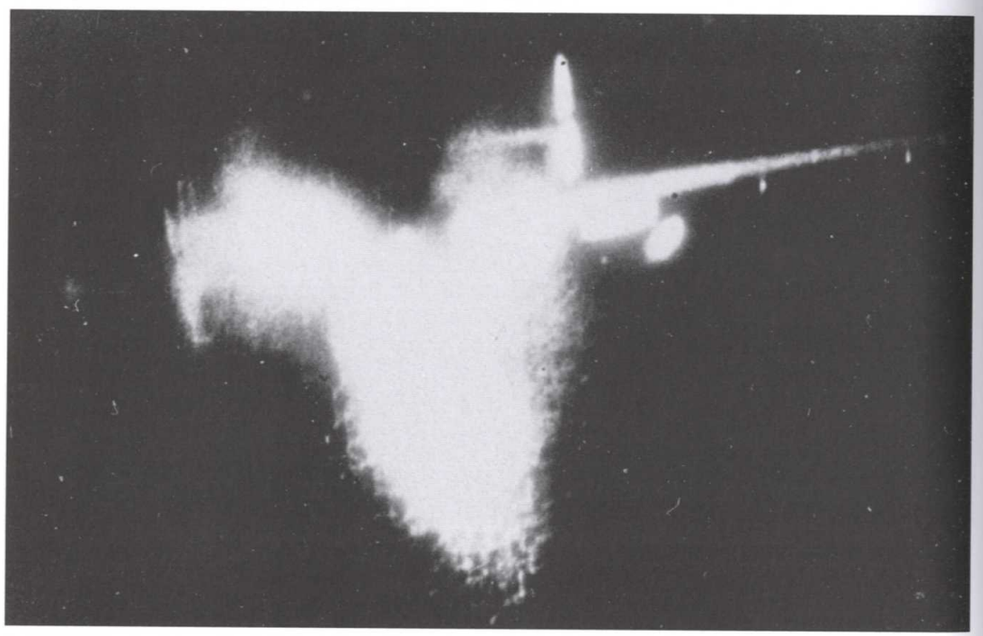
Arado Ar 234 reconnaissance aircraft of Kommando Sperling pictured at Rheine in western Germany in the autumn of 1944. These high speed aircraft ranged with impunity over France, Holland, Belgium



and southern England, photographing targets at will. To enable the aircraft to take off with full tanks, they were towed to the take-off point before starting engines for the mission. Götz

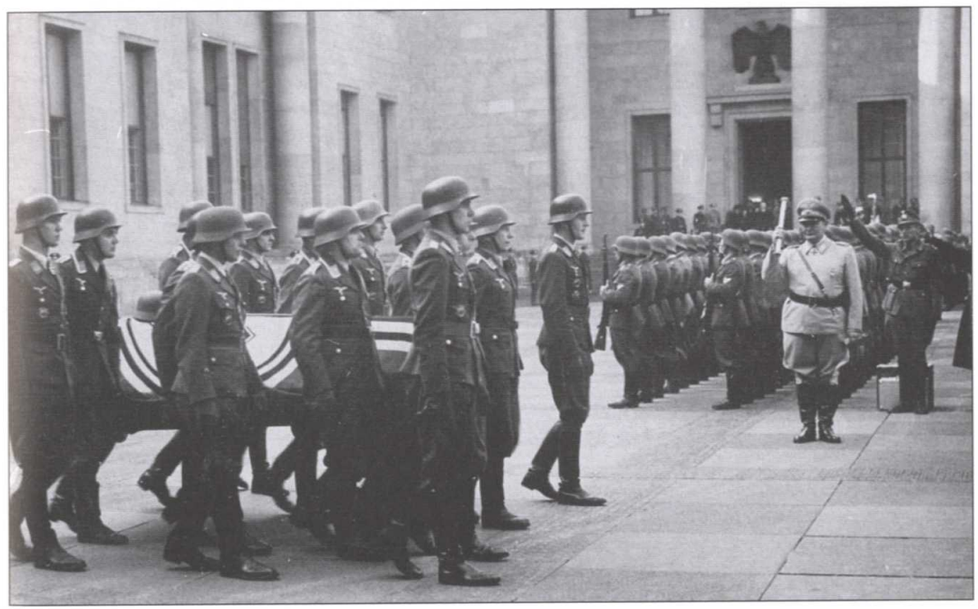


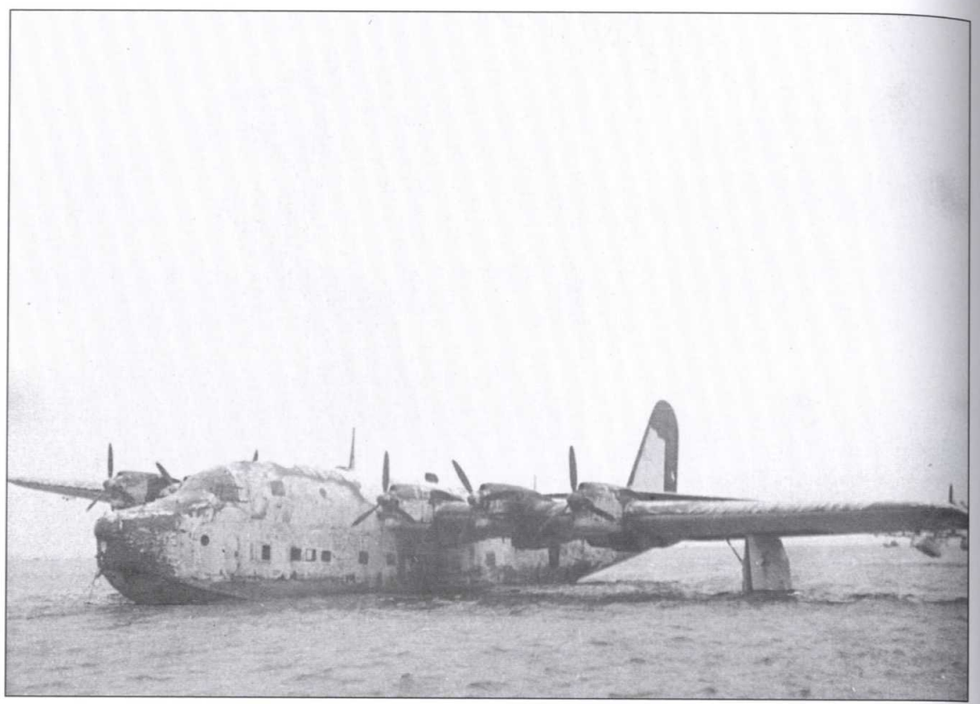
During the late spring of 1944 Mosquito night-fighters of No. 100 Group of the RAF began flying long-range night escort missions deep into Germany. This Ju 88G night-fighter carries rear-looking radar, to give warning of enemy aircraft approaching from behind.



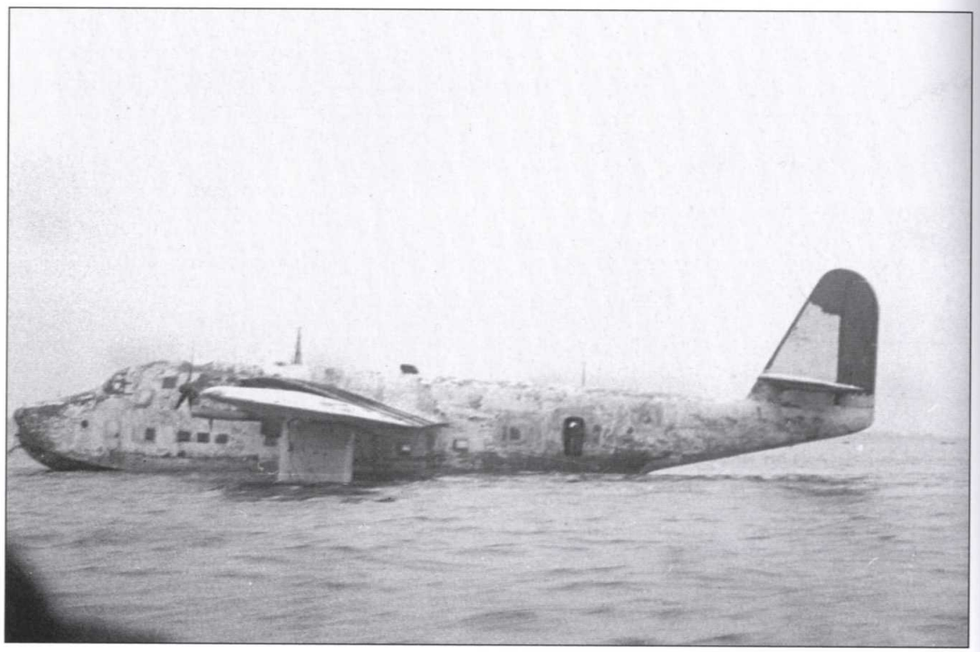
Bf 110 night-fighter on fire, after being hit by rounds from a Mosquito of No. 100 Group.

On 5 October 1944 the German night-fighter force lost its leading ace. Oberst Helmut Lent, the commander of NJG 3, suffered fatal injuries when his Bf 110 crashed as he attempted a single-engine landing. At the time of his death Lent was credited with 102 night and 8 day victories. Hermann Göring attended his funeral, and is seen raising his baton in salute to the coffin.

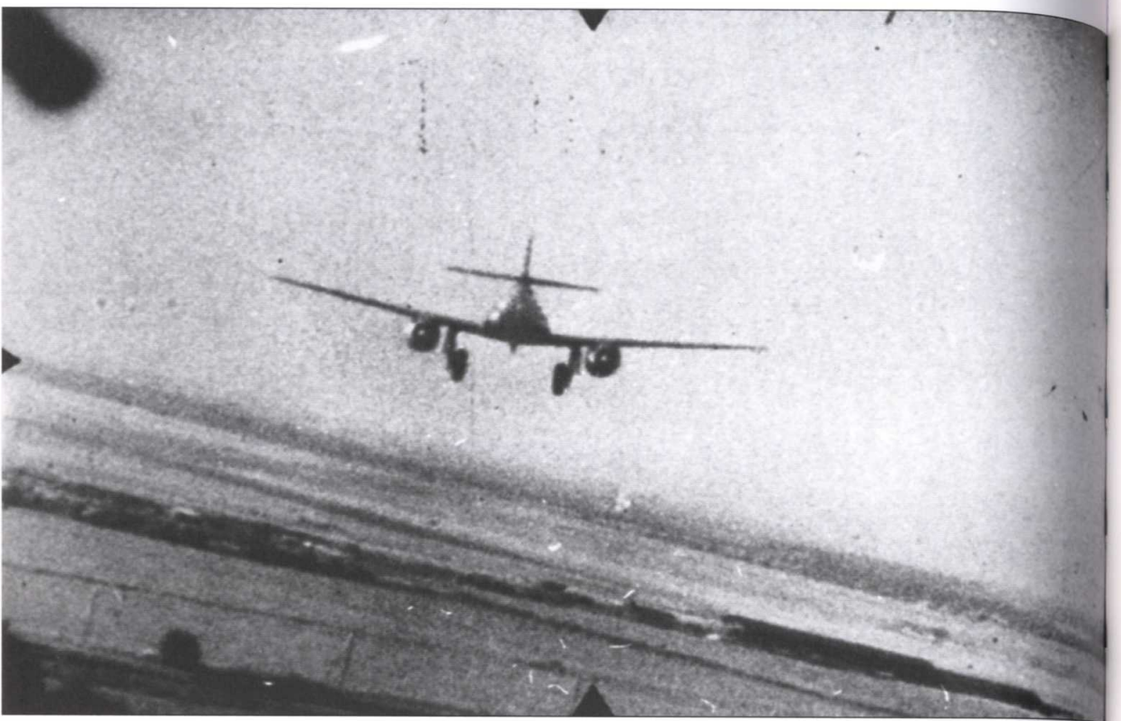




The huge Blohm und Voss 222 flying boat, here seen in winter camouflage, was used to ferry troops and supplies to German bases in Norway during the final months of the war.

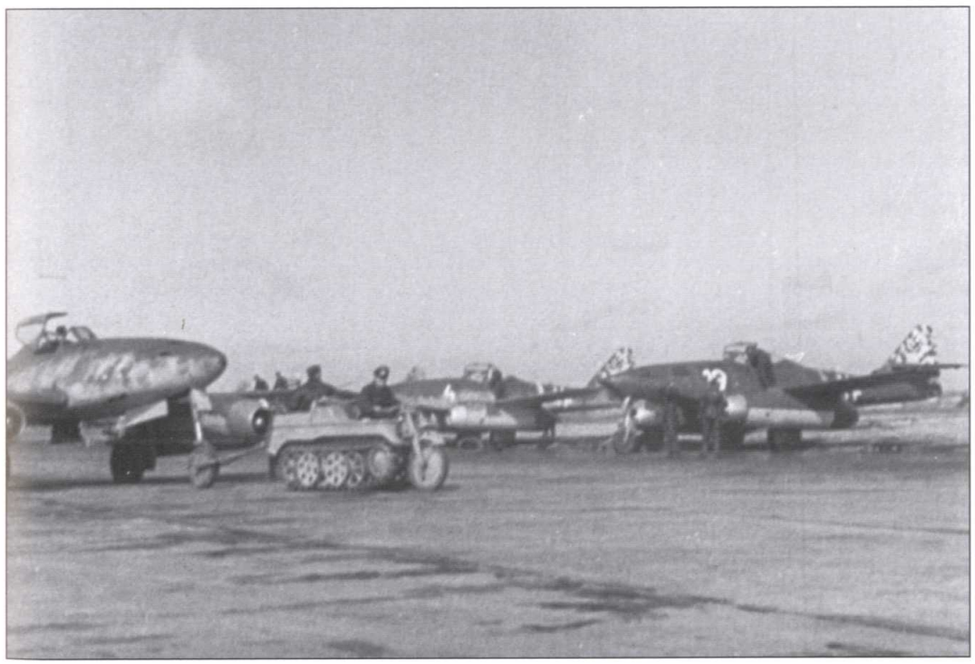


Major Walter Nowotny, an Austrian fighter ace, amassed 255 victories on the Eastern Front. In July 1944 he assumed command of the Me 262 Test Kommando and this unit was renamed after him. In September he led Kommando Nowotny in action, but was killed during an air combat on 8 November 1944.

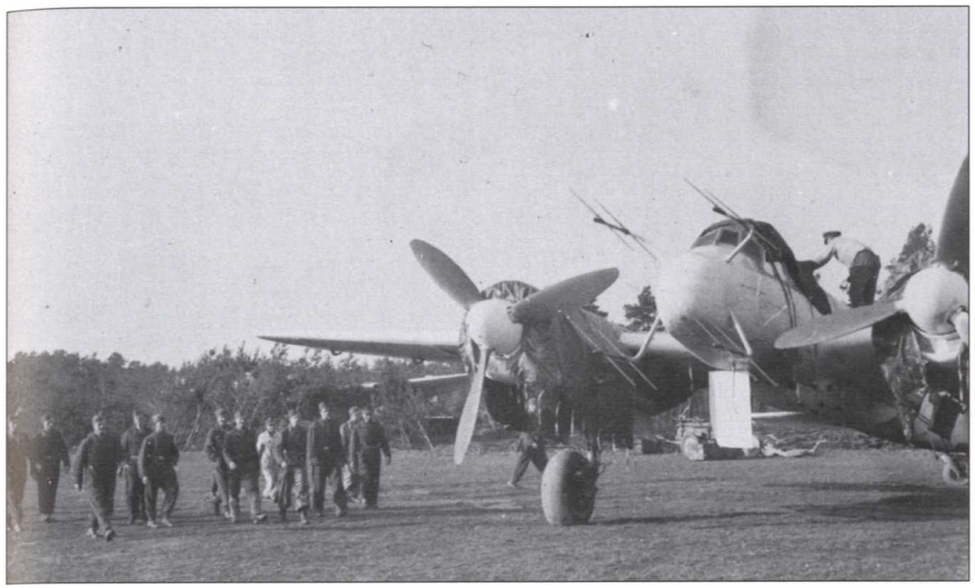


The Me 262 was helpless against fighter attack once the pilot had throttled back and was committed to landing, as in the case of this aircraft framed in the gunsight of a US fighter. Early jet engines like the Jumo 004 were slow to accelerate from idling. If the German pilot had opened his throttles to avoid the attack, most likely the Me 262 would hit the ground before it gained sufficient speed to climb away

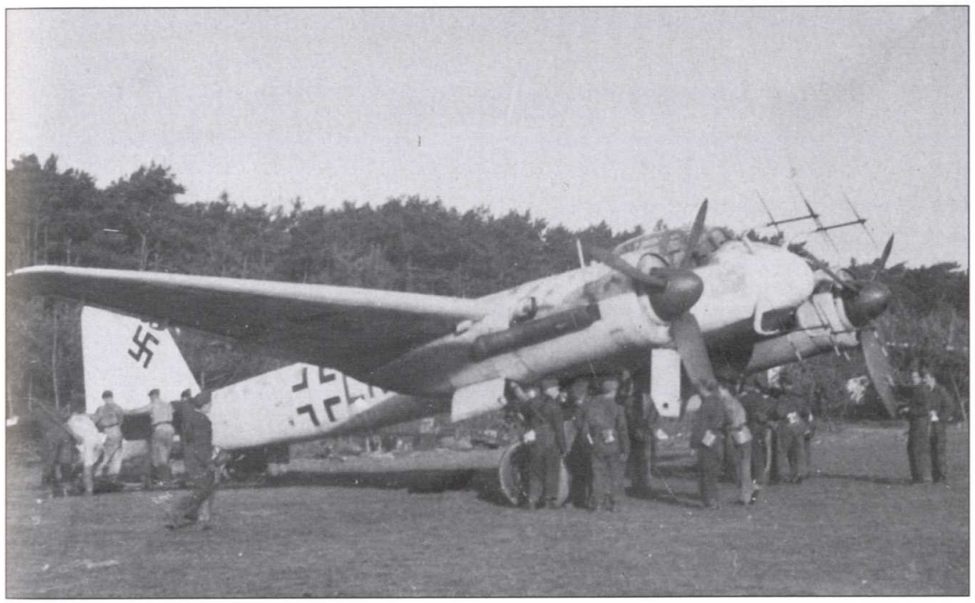
Me 262 fighters belonging to Ergänzungs (Replacement Training) Jagdgeschwader 2 operating at Lechfeld in the autumn of 1944. Poor serviceability slowed the pace of training and greatly extended the time required to bring pilots to combat readiness.

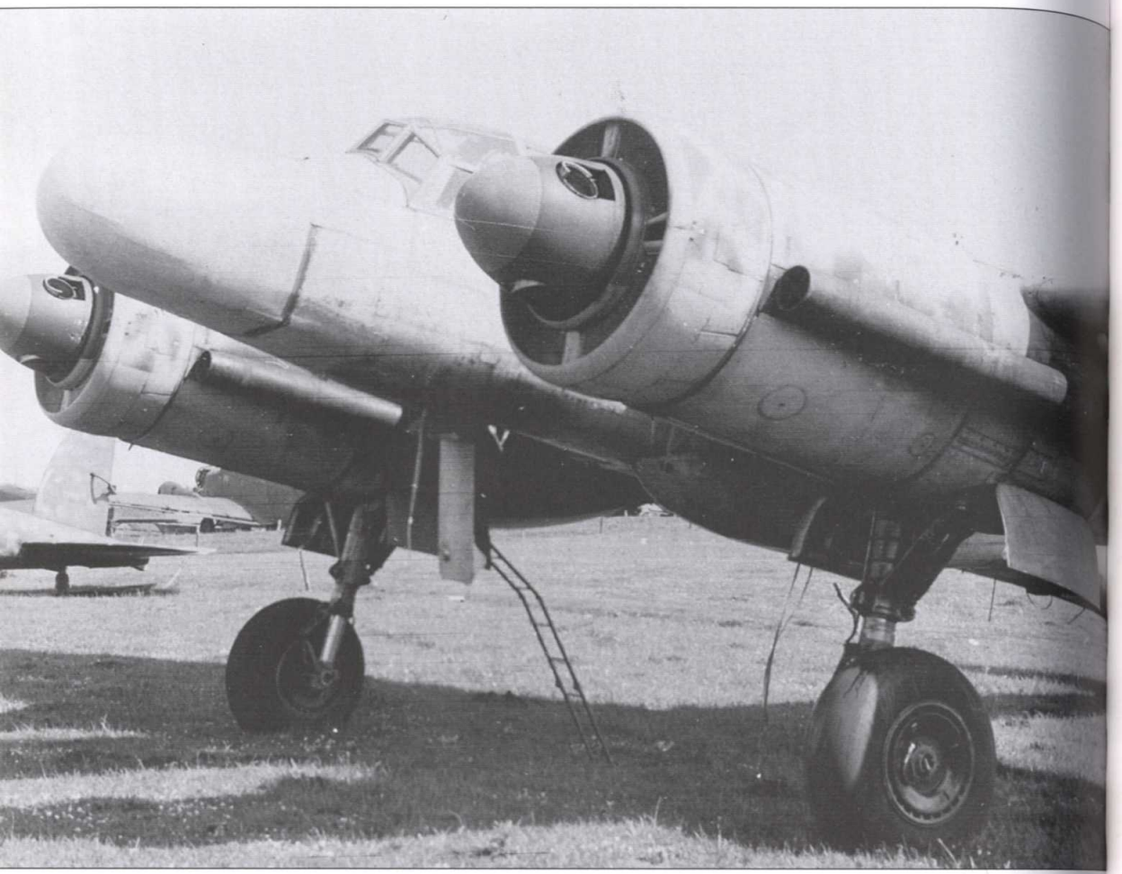


A small number of Me 262 jet fighters were converted for the night-fighter role by the installation of Neptun radar.



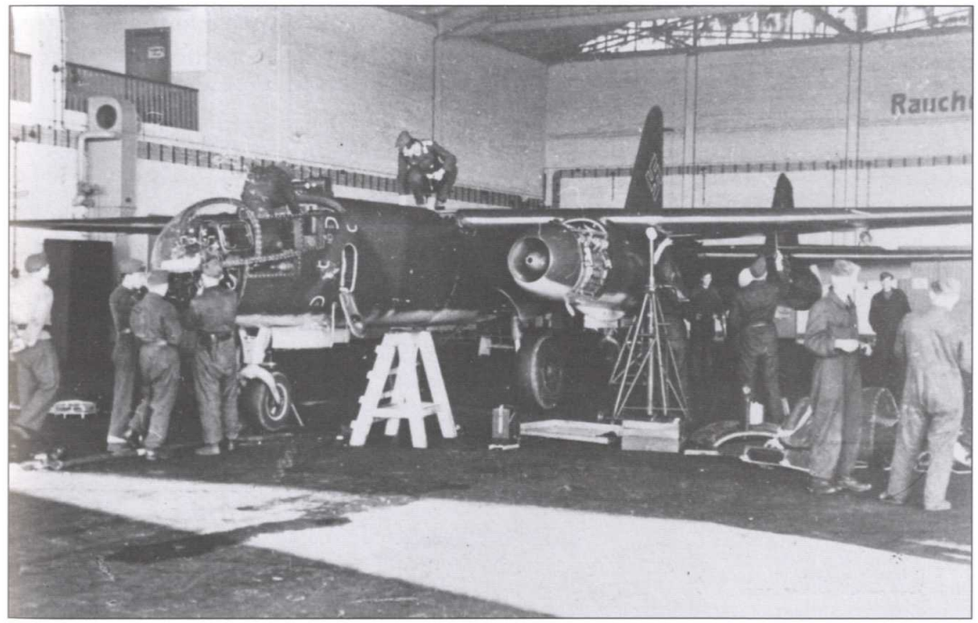
Ju 88G night-fighter of NJG 100 being prepared to go on standby for a night mission. via Obert

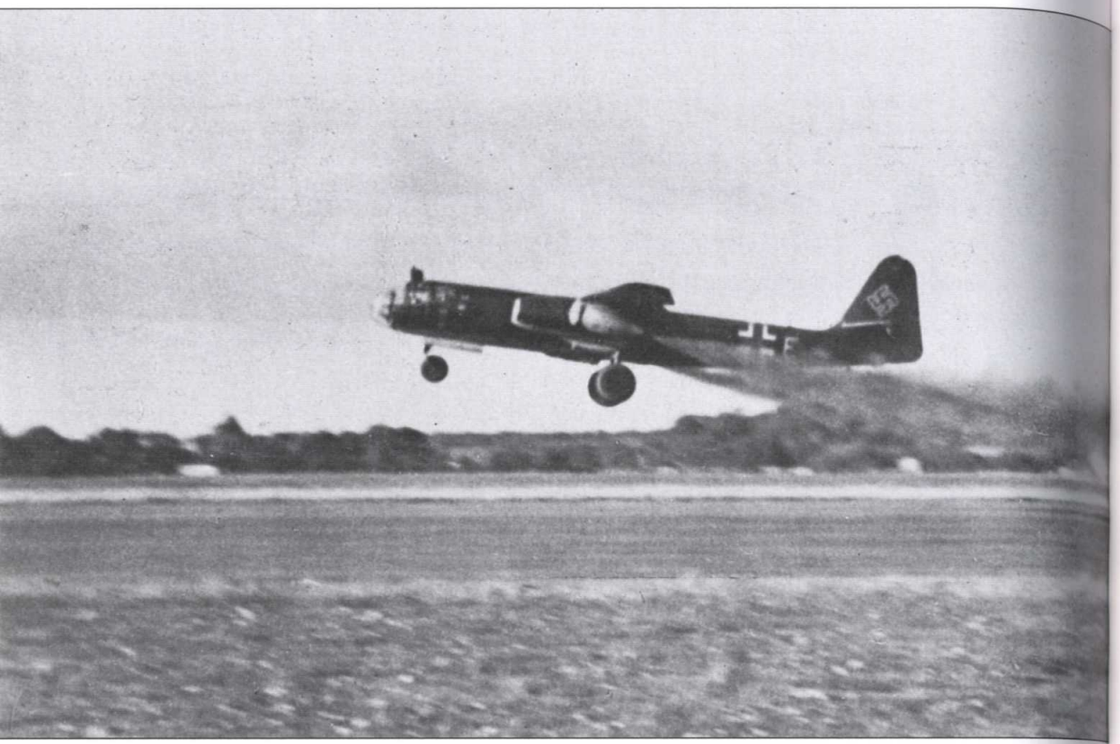




Ju 88G night-fighter fitted with the Berlin centimetric wavelength radar, with the scanner inside a streamlined nose cone. A few aircraft went into action with this equipment during the final weeks of the war.

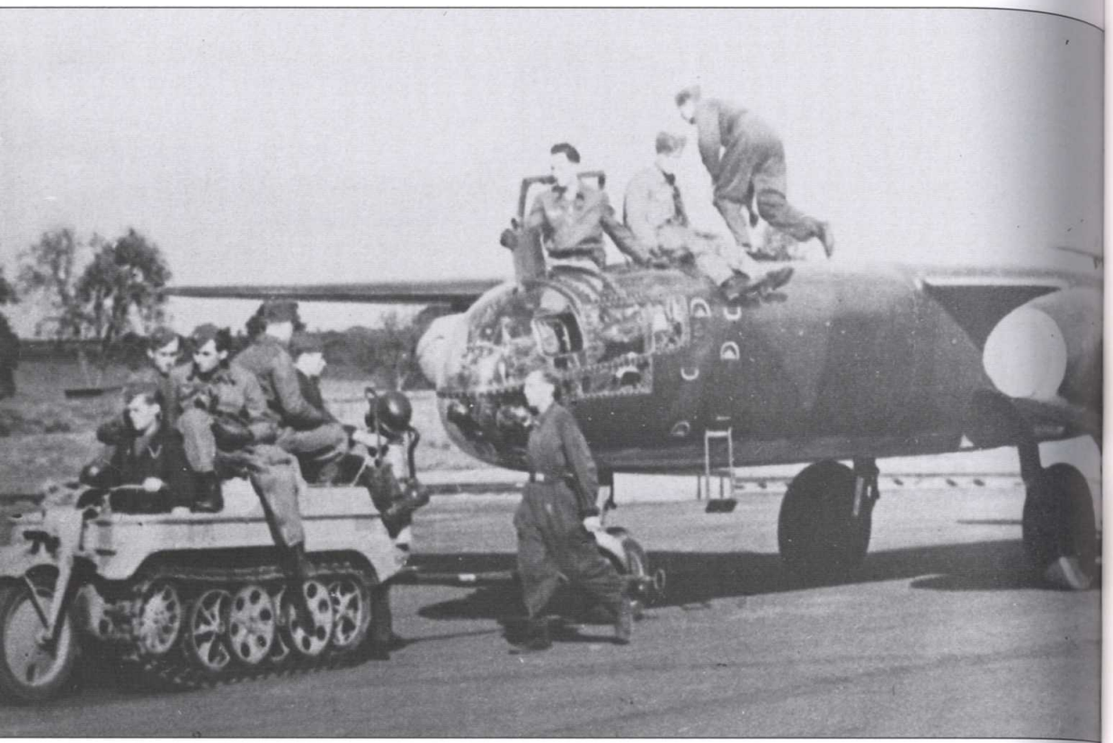
Arado Ar 234 bombers of IIIrd Gruppe Kampfgeschwader 76, photographed at Burg bei Magdeburg in the autumn of 1944 when the unit was working up for operations. KG 76 Archiv





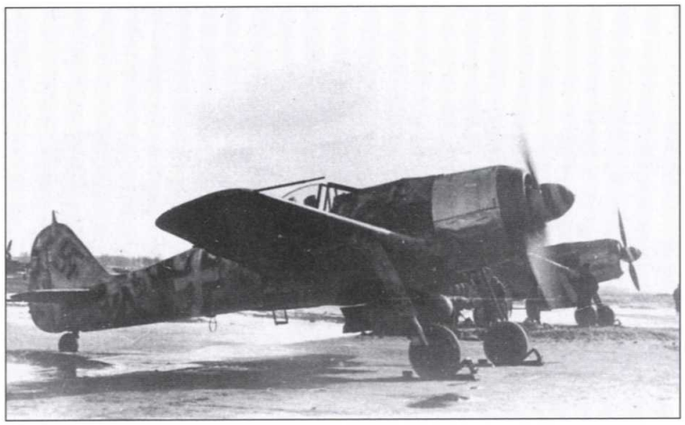
When making a heavy weight take off from a standard service airfield, the Ar 234 needed the assistance of two liquid fuel booster rockets mounted under the outer wings. In this photograph an aircraft is seen getting airborne with rocket assistance, leaving a dense trail of smoke behind it.

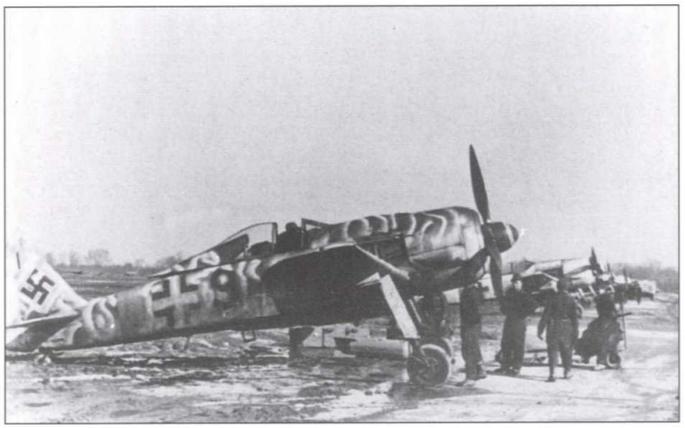
A groundcrewman straddles the Jumo 004 of an Ar 234, to show the small diameter of the turbojet.



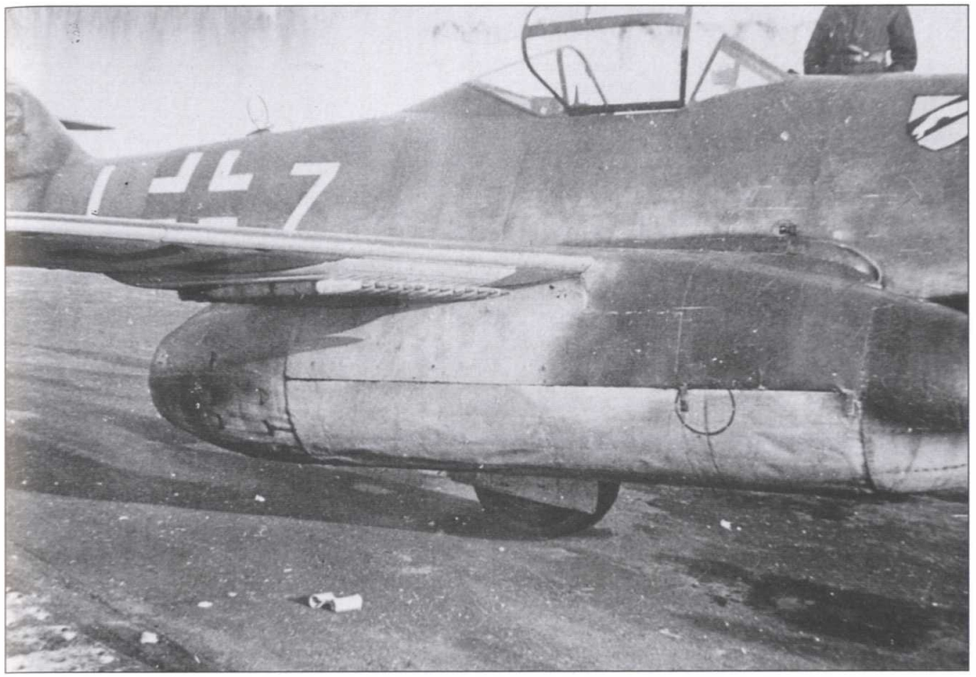
Kettenrad tractor used to tow an Ar 234 back to its dispersal after a flight.

Bomber ace Major Hans-Georg Bätcher (second from right) commanded III./KG 76 when the unit re-formed with Ar 234s. On the far right is Hauptmann Diether Lukesch, the commander of the 9th Staffel which was the first unit to take the new bomber into action. KG 76 Archiv

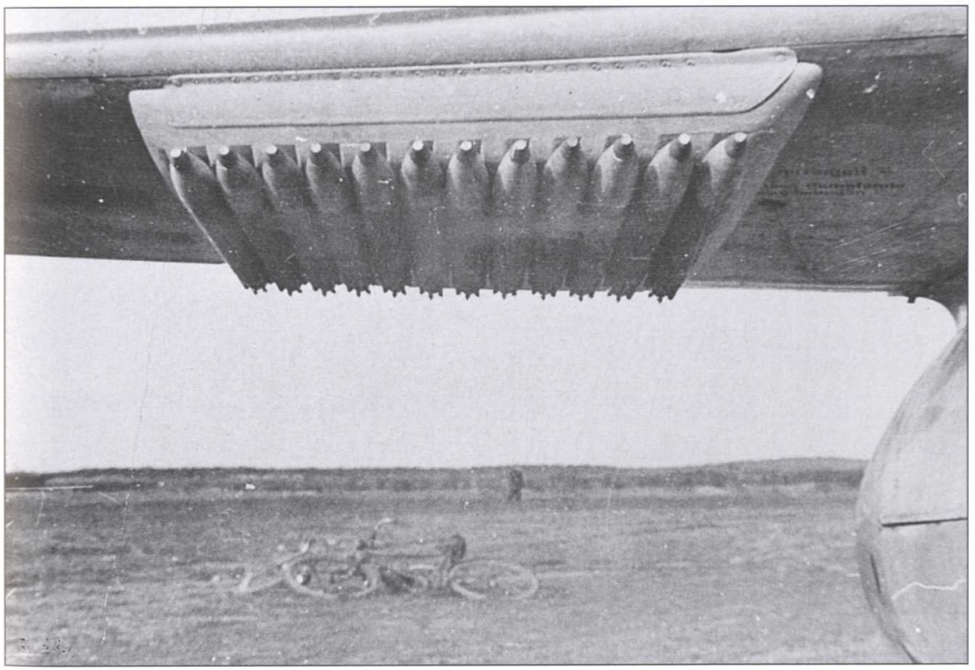


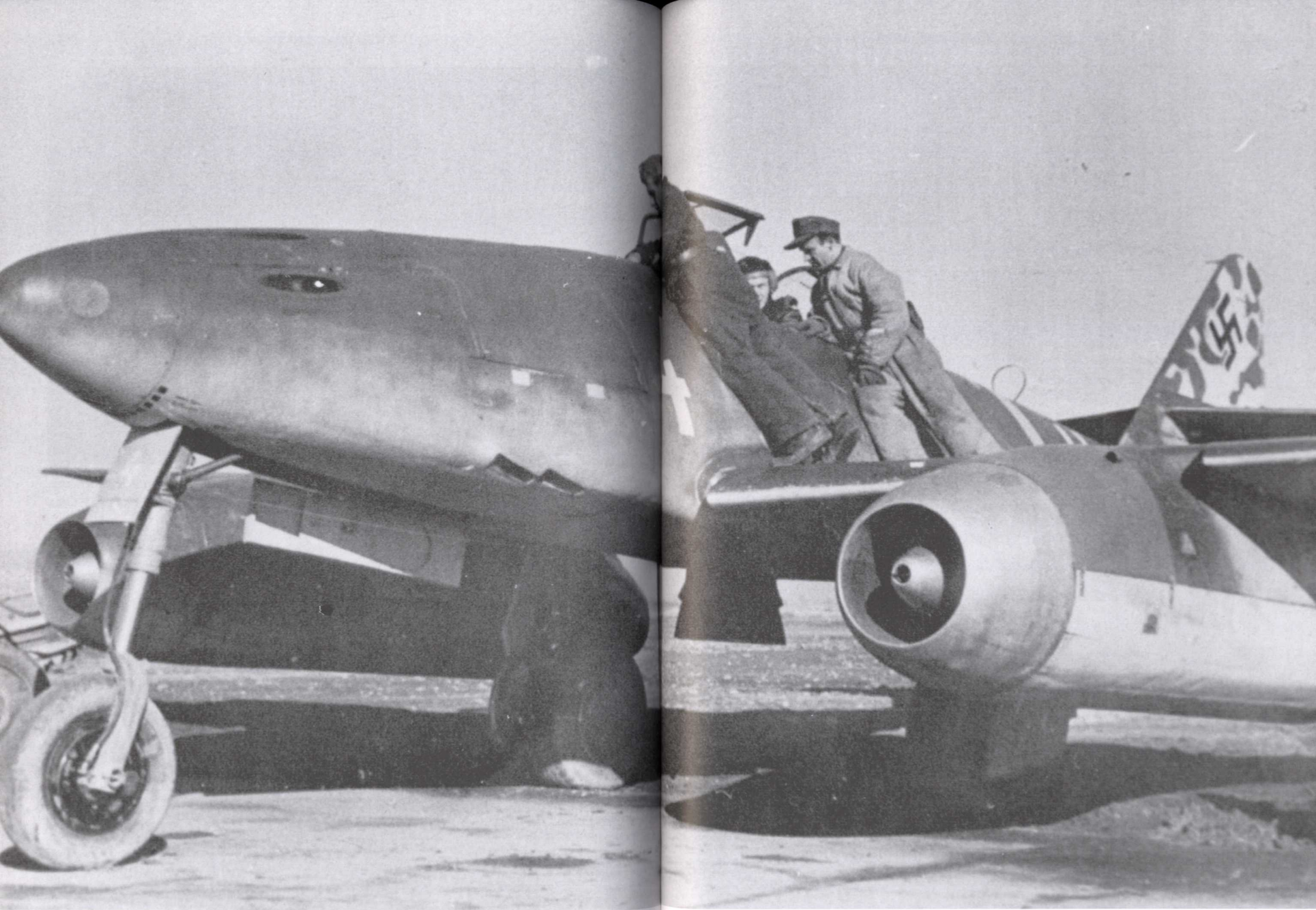


By mid-1944 the Focke Wulf Fw 190 had replaced the Ju 87 in most ground attack units. These examples belonged to Schlachtgeschwader 10 (SG 10) based at Sopoc/Puszta in Hungary in January 1945. via Obert

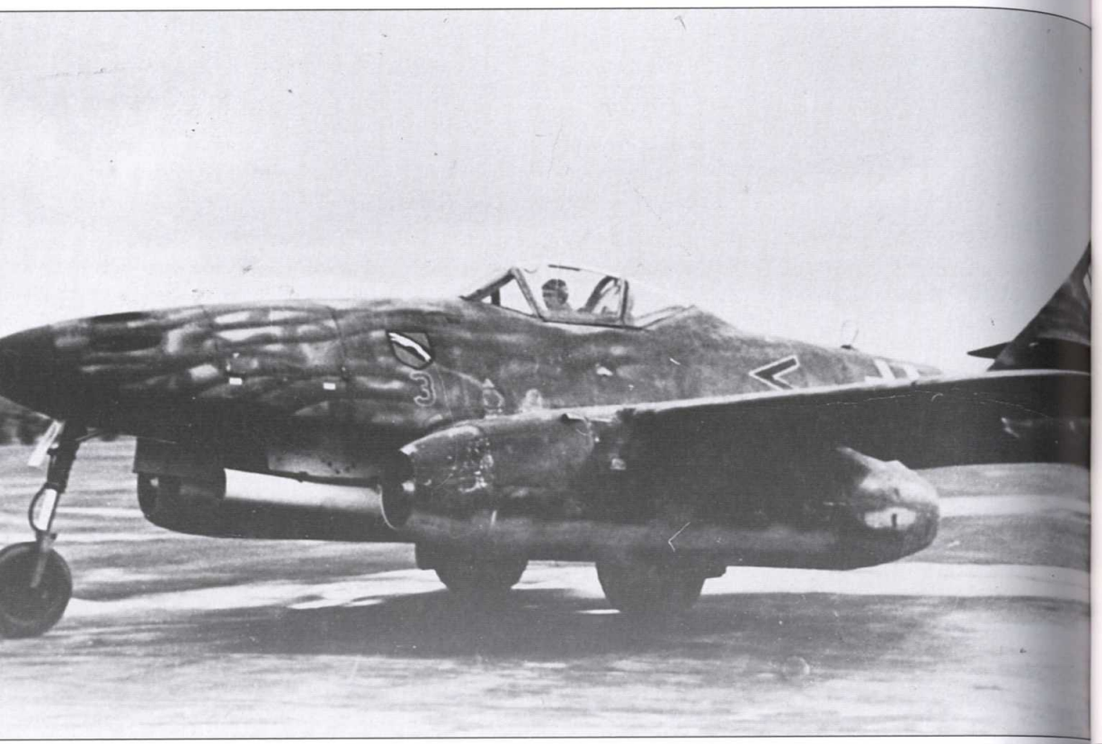


Me 262 of Jagdgeschwader 7, with a rack for twelve 55-mm air-to-air rockets mounted under each wing. First used in action in March 1945, these unguided weapons were ripple-fired in one burst at a single target.



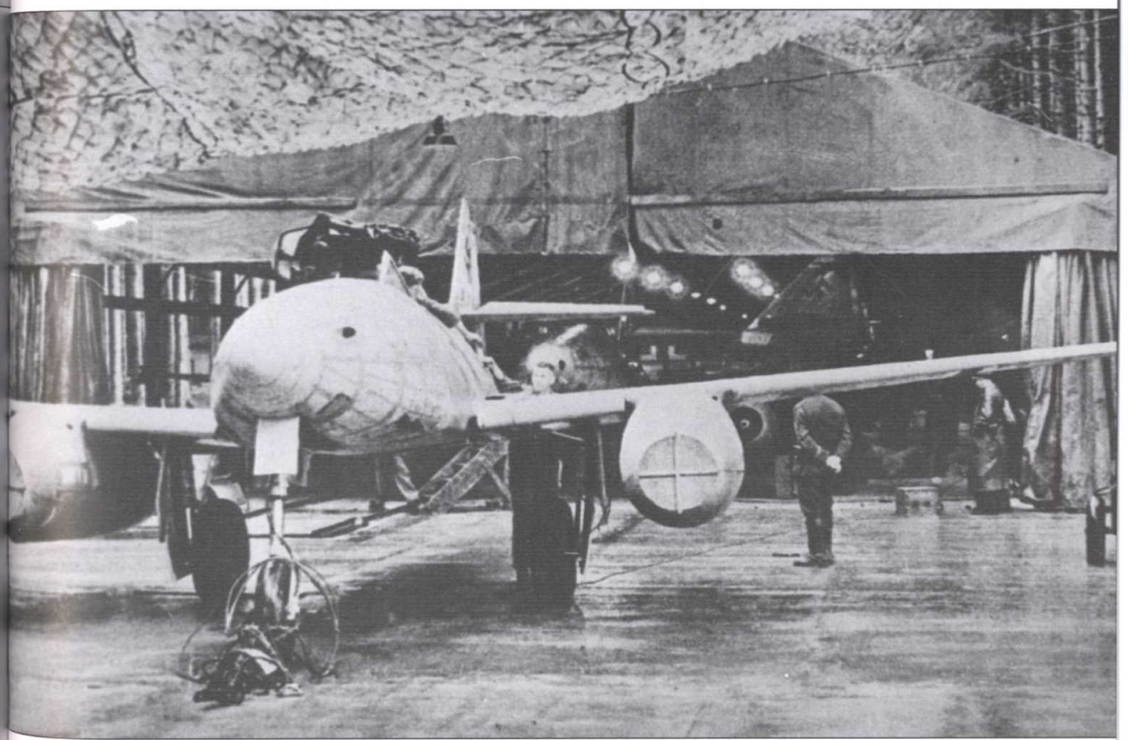


Me 262 of JG 7 being refuelled at Perleberg near Berlin in April 1945.



Me 262 of JG 7 fitted with a pair of 21-cm rocket launchers under the nose. The installation was not a success and it is believed that this was the only aircraft to carry it.

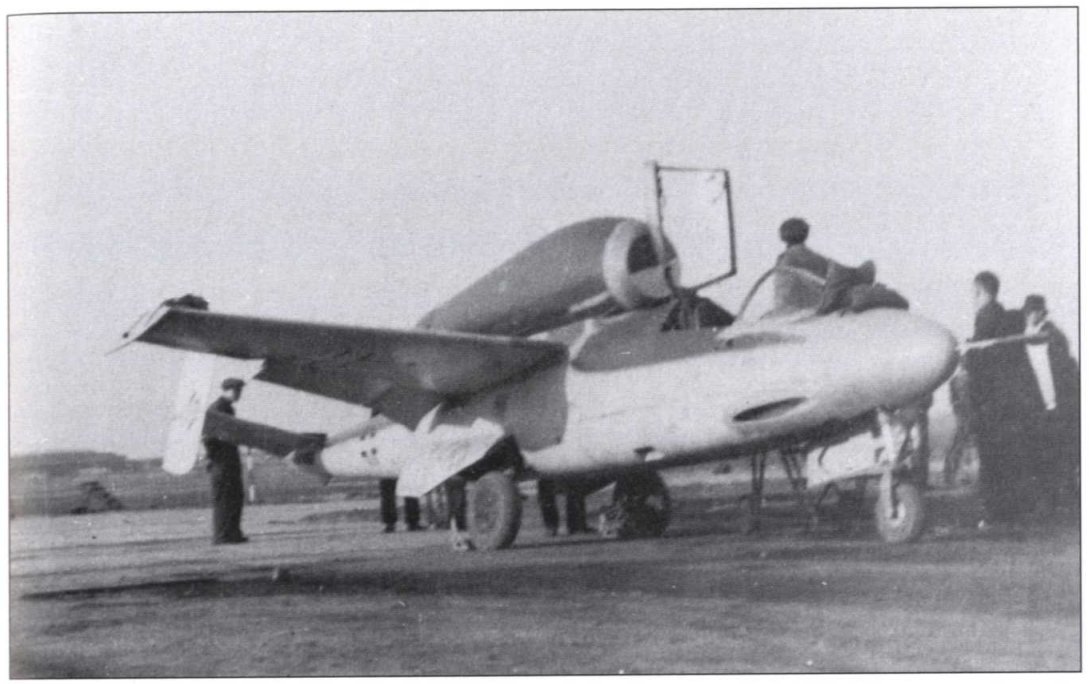
A newly completed Me 262 leaving the heavily camouflaged assembly plant at Leipheim near Ulm. Although more than 1,200 Me 262s were delivered to the Luftwaffe by the end of the war, only a small proportion of these were available for operations at any one time. via Hans Selinger



Dramatic combat photograph taken from a P-51 Mustang, showing an Me 262 under attack while it was engaging another Mustang. While the jet fighter maintained high speed it was a difficult target for the Allied piston-engined fighters. Once a jet fighter slowed down to engage in a turning fight with Allied fighters it was at a disadvantage, however. Several of the German jet fighters were shot down in combat. USAF

ADVANCED AIRCRAFT, SECRET WEAPONS

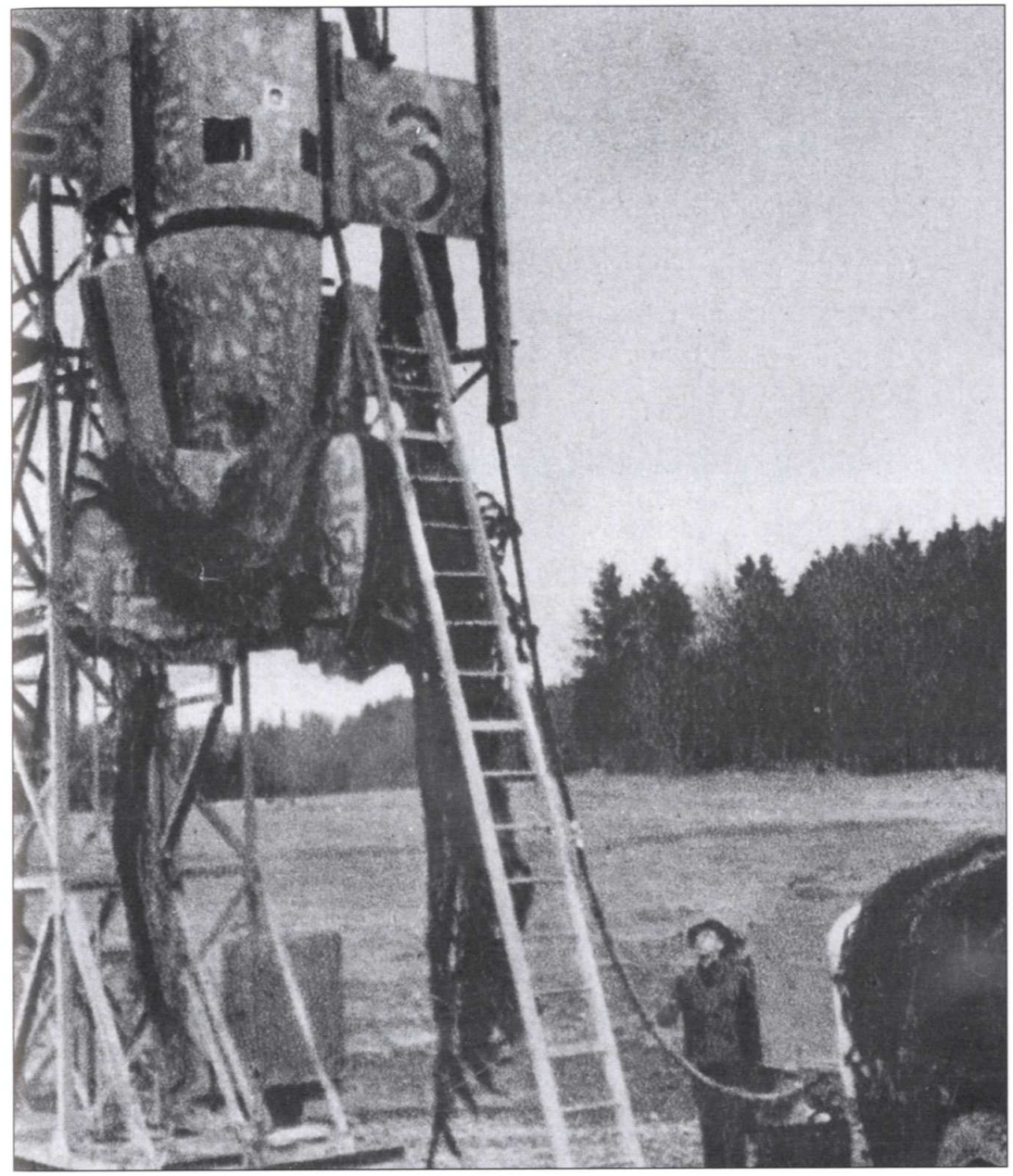
Heinkel He 162 jet fighters of JG 1, which began operations with the type shortly before the end of the war. Demuth



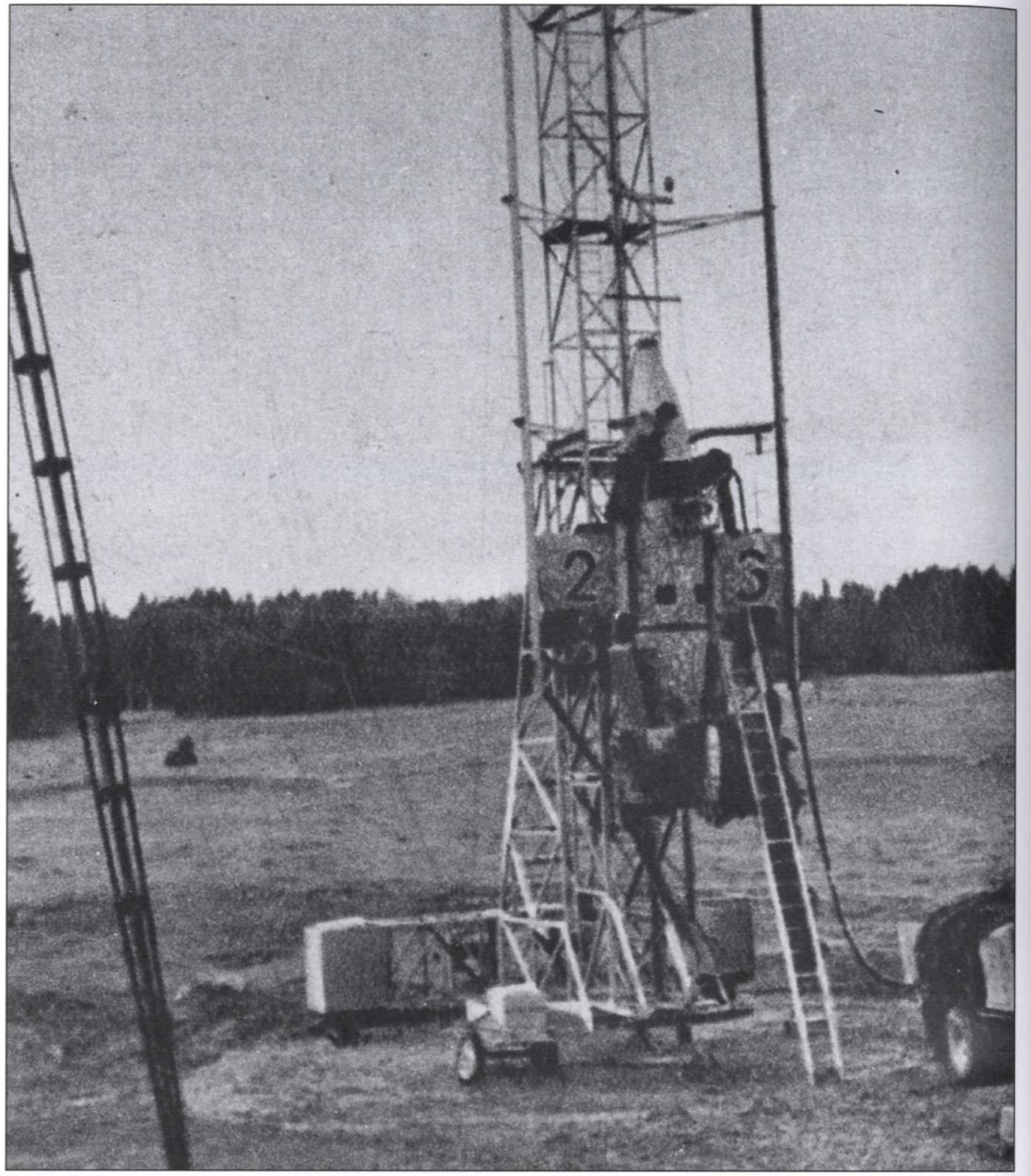
Rare photograph of an airborne He 162 in German markings.

Underground production of He 162 fuselages, in a disused salt mine at Tarthun near Magdeburg.

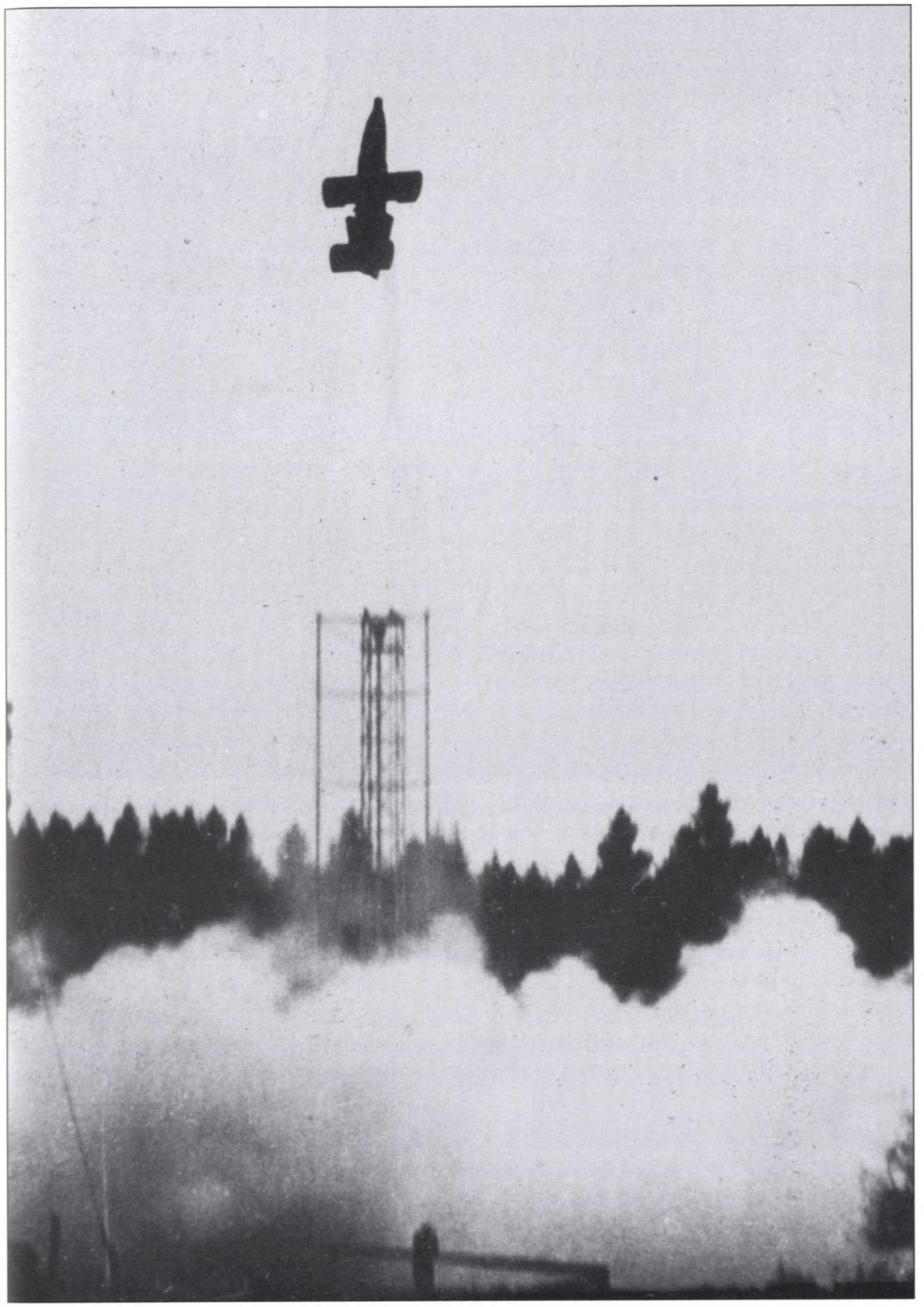
The rocket-propelled Bachem 349 Natter point-defence interceptor took off vertically from a special railed launcher. After a vertical climb, it levelled out at the target's altitude and the pilot fired his battery of rockets in a single attack run. Then the pilot bailed out, and he and the rear fuselage housing the rocket motor came down on separate parachutes. The first operational unit was deployed at the very end of the war, but the weapon never went into action. Given the difficulties of training pilots to operate the interceptor (every launch would have been an operational launch), it was unlikely to have achieved any significant results in combat. via Heise



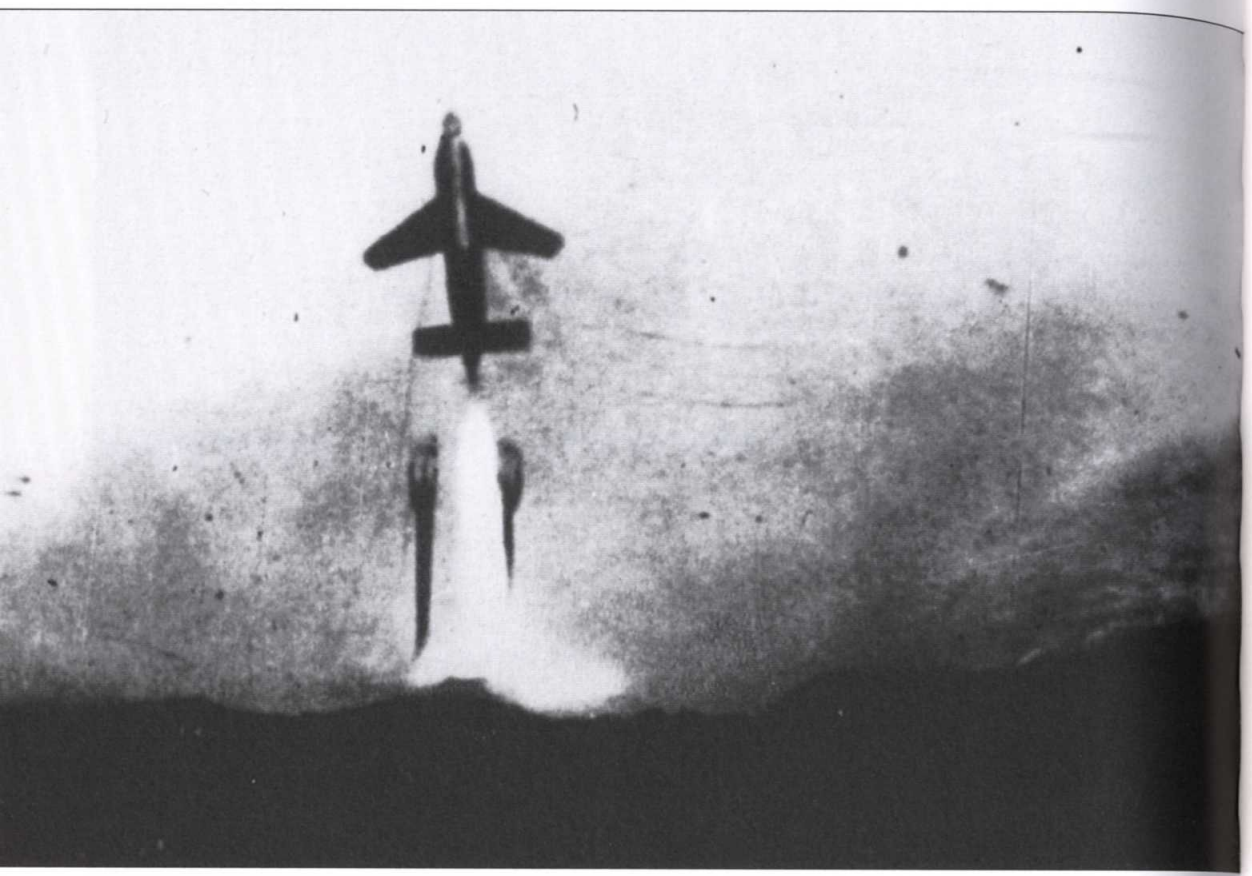
Filling the Natter's fuel tanks prior to a launch. The operation required scrupulous cleanliness, for the smallest amount of dirt or foreign matter coming into contact with the concentrated hydrogen peroxide could lead to an explosion.



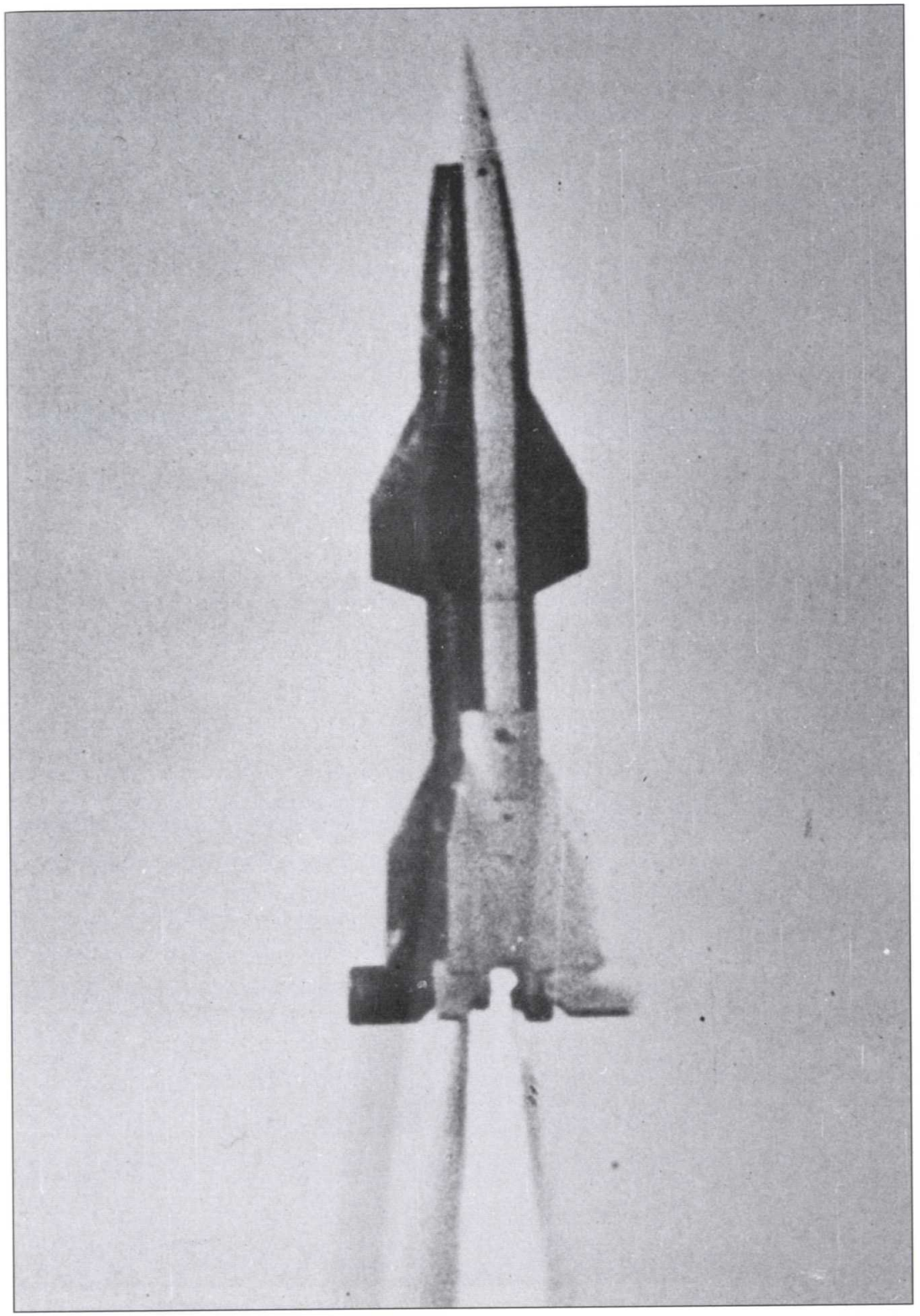
General view of the Natter on its launcher during refuelling.



Leaving a trail of smoke from the solid fuel boosters, and super-heated steam from the liquid fuel sustainer motor, a Natter accelerates rapidly away from the launching ramp.

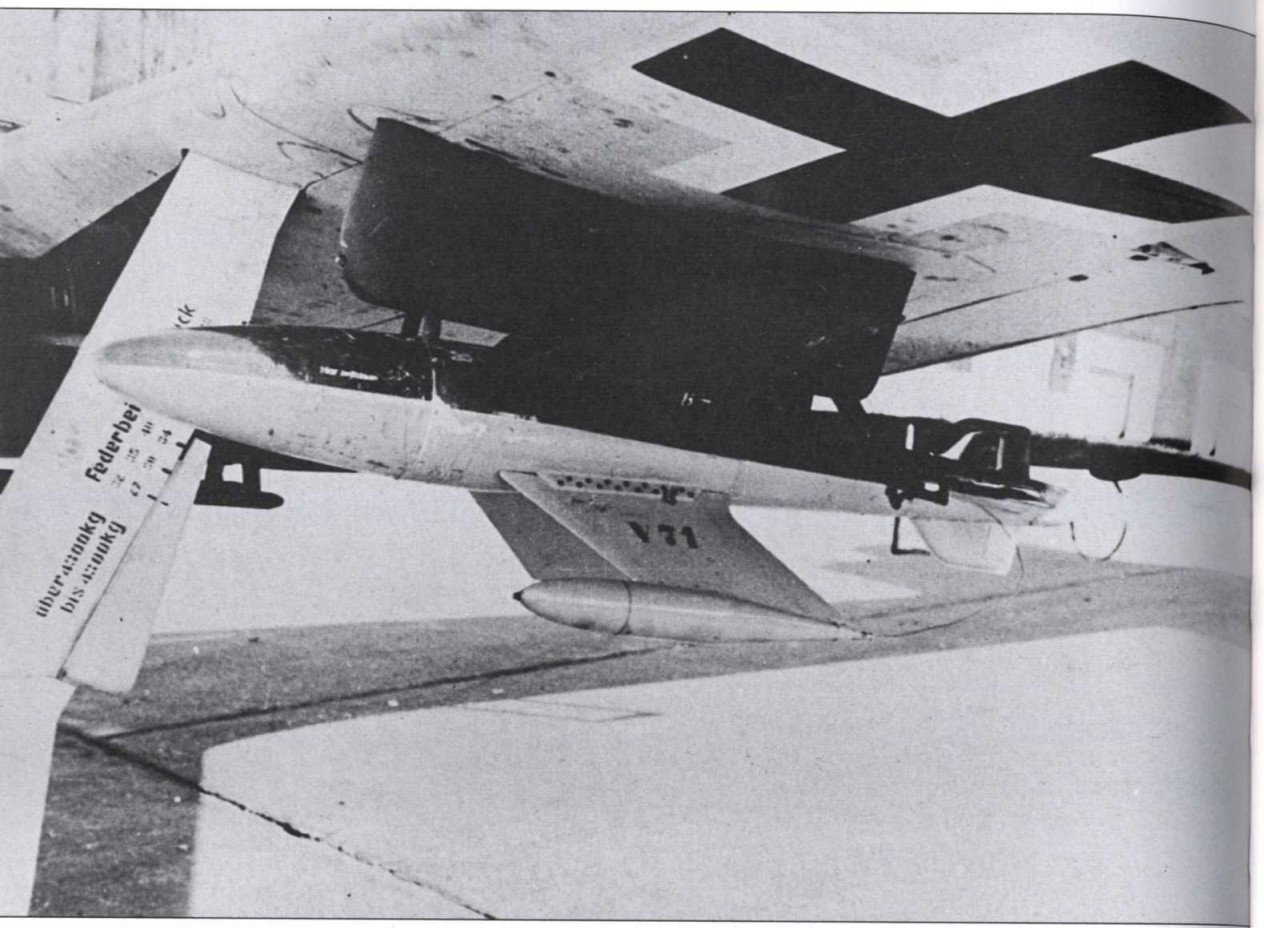


The Henschel Hs 117 Schmetterling surface-to-air missile, planned to make its initial service deployment in the late spring of 1945. The German first generation anti-aircraft guided missiles were naïve in concept, and in their initial service versions they were unlikely to have been effective. In each case the missile had to be command-guided throughout its flight by a human operator using a joystick controller. The missiles had no system for homing on their targets, and they lacked proximity fuses to detonate the warhead when in the vicinity of the target. Thus, to achieve a kill, these weapons had to score a direct hit. If darkness, cloud or haze prevented continuous optical tracking of the target, there was little chance of a successful engagement. As a separate problem, the relatively simple radio command guidance system fitted to the Schmetterling and Wasserfall surface-to-air weapons would have been vulnerable to electronic jamming.

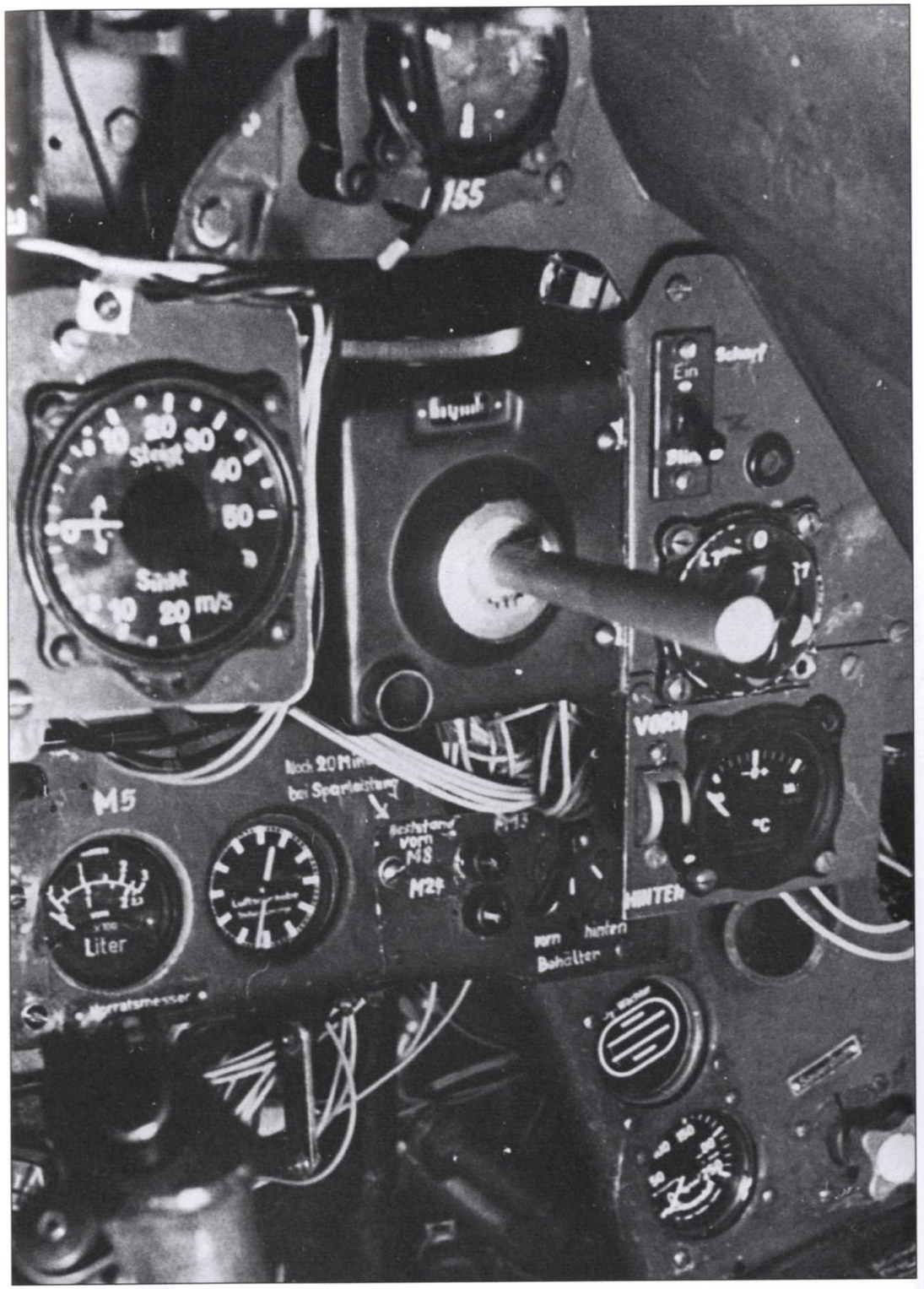


The Wasserfall surface-to-air missile was a scaled-down version of the A-4 (V.2) bombardment rocket and was to have gone into service late in 1945.

The Ruhrstahl X-4 air-to-air missile (here and overleaf) carried a 44-pound warhead and had an effective maximum range of about 3,000 yards. These examples are pictured fitted to an Fw 190 trials aircraft. After launch the missile unreeled thin wires from bobbins on two of the wing tips.



The wire guidance system of the X-4 required that the missile be guided throughout its flight by the pilot of the launching fighter. During that time the fighter had to fly straight and level behind the target. If the pilot wished to evade attack, he had to abandon the missile attack. Given the near certainty of interference from enemy escort fighters if the X-4 was used in action, it is unlikely that the weapon could have been very effective.



To steer the X-4 missile in flight, the pilot operated a small joystick in the cockpit. This produced the appropriate electronic command signals, which were transmitted down the wires to the missile.

The end: He 162 jet fighters of JG 1 pictured on 5 May 1945, lined up at Lech in Schleswig-Holstein, waiting to surrender to British troops.

Appendix A
Luftwaffe Flying Units

The Staffel

During the early part of the war the Staffel (plural Staffeln) had a nominal strength of nine aircraft, and it was the smallest combat flying unit in general use in the Luftwaffe. The Staffeln within a Geschwader were designated using Arabic numbers. The 1st, 2nd and 3rd Staffeln belonged to the Ist Gruppe, the 4th, 5th and 6th belonged to the IInd Gruppe and 7th, 8th and 9th Staffeln belonged to the IIIrd Gruppe. If there was a IVth Gruppe (there were a few of these during the early part of the war), it comprised the 10th, 11th and 12th Staffeln.

The Gruppe

The Gruppe (plural Gruppen) was the basic flying unit of the Luftwaffe for operational and administrative purposes. Initially it was established as three Staffeln, each with nine aircraft, and a Staff Flight with three, making thirty aircraft in all. After a prolonged period in action a Gruppe could be considerably smaller than that, however.

The Geschwader

The Geschwader (plural Geschwader) was the largest flying unit in the Luftwaffe to have a fixed nominal strength, initially three Gruppen with a total of ninety aircraft, and a Staff unit of four, making a total of ninety-four aircraft. Originally it had been intended that the Gruppen of each Geschwader would operate from adjacent airfields, but under the stress of war this idea had to be abandoned.

The Fliegerkorps and the Luftflotte

The Fliegerkorps (Air Corps) and the larger Luftflotte (Air Fleet) varied in size, and the number of Gruppen assigned to them depended on the importance of their area of operations.

Appendix B
Luftwaffe Unit Role Prefixes

Luftwaffe Geschwader, Gruppen and Staffeln carried the following prefixes (abbreviated prefixes in brackets) to denote their operational roles:

Aufklärungs- (Aufkl.)	Reconnaissance
Bordflieger- (Bordfl.)	Equipped with floatplanes for operation from warships
Erprobungs- (Erpr.)	Operational Trials Unit
Fernaufklärungs- (FA)	Long-Range Reconnaissance
Jagd- (J)	Fighter
Jagdbomber- (Jabo)	Fighter-Bomber
Kampf- (K)	Bomber
Kampf- z b V (KzbV)	*zur besonderen Verwendung*, literally 'bomber for special purposes', meaning Transport
Küstenflieger- (Kü.Fl)	Unit engaged in coastal operations
Lehr- (L)	Tactical Development Unit
Minensuchs- (MS)	Mine Search (aircraft fitted with equipment to explode magnetic mines from the air)
Nachtjagd- (NJ)	Night Fighter
Nahaufklärungs- (NA)	Short-Range Reconnaissance
Schlacht- (S)	Ground Attack
Schnellkampf- (SK)	High-Speed Bomber
Seeaufklärungs- (Seeaufkl.)	Sea Reconnaissance
Seenot- (SN)	Air-Sea Rescue
Sturzkampf- (St)	Dive bomber
Träger- (T)	Unit formed to operated from aircraft carrier
Wettererkundungs- (Weku)	Weather Reconnaissance
Zerstörer- (Z)	Twin-engined fighter

Appendix C
Equivalent Wartime Ranks

Luftwaffe	**RAF**	**USAAF**
Generalfeldmarschal	Marshal of the RAF	(no equivalent)
Generaloberst	Air Chief Marshal	General (4 star)
General der Flieger	Air Marshal	General (3 star)
Generalleutnant	Air Vice-Marshal	General (2 star)
Generalmajor	Air Commodore	General (1 star)
Oberst	Group Captain	Colonel
Oberstleutnant	Wing Commander	Lieutenant Colonel
Major	Squadron Leader	Major
Hauptmann	Flight Lieutenant	Captain
Oberleutnant	Flying Officer	1st Lieutenant
Leutnant	Pilot Officer	2nd Lieutenant
Stabsfeldwebel	Warrant Officer	Warrant Officer
Oberfeldwebel	Flight Sergeant	Master Sergeant
Feldwebel	Sergeant	Technical Sergeant
Unterfeldwebel	(no equivalent)	(no equivalent)
Unteroffizier	Corporal	Staff Sergeant
Hauptgefreiter	(no equivalent)	Sergeant
Obergefreiter	Leading Aircraftman	Corporal
Gefreiter	Aircraftman First Class	Private First Class
Flieger	Aircraftman Second Class	Private Second Class

INDEX

THERE is much to find intriguing about Hitler's Luftwaffe. During six short years, it rose from almost nothing to become the terror of Europe. At the outbreak of the Second World War in September 1939, it was the most powerful air force in the world. The aircraft were state-of-the-art and the crews were numerous and highly motivated.

During the first two and a half years of the war, the Luftwaffe made possible the German Army's series of lightning victories. Its only serious setback came in the summer of 1940 during the Battle of Britain, when the RAF foiled its attempt to establish air superiority over southern England as a prelude to invasion.

Then, gradually but inexorably, the air forces of Germany's enemies became stronger than her own. On each battlefront in turn, the Luftwaffe was forced onto the defensive despite trying to overcome its many problems with great ingenuity and courage. To the end, it could never be discounted in the Allied calculations. When the war ended in May 1945 the Luftwaffe possessed some 3,500 combat aircraft. It had fought valiantly against ever-lengthening odds, but when the end came the Luftwaffe was overwhelmed by pressures beyond its control.

Author Alfred Price spent several years touring Germany and interviewing Luftwaffe veterans. The majority of photographs in this book came from their personal albums. Taken together, they provide a unique pictorial record of this important phase in twentieth-century history.

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