

Warrior

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Kampfflieger:
Bomber Crewman of
the Luftwaffe 1939–45



Robert Stedman • Illustrated by Adam Hook



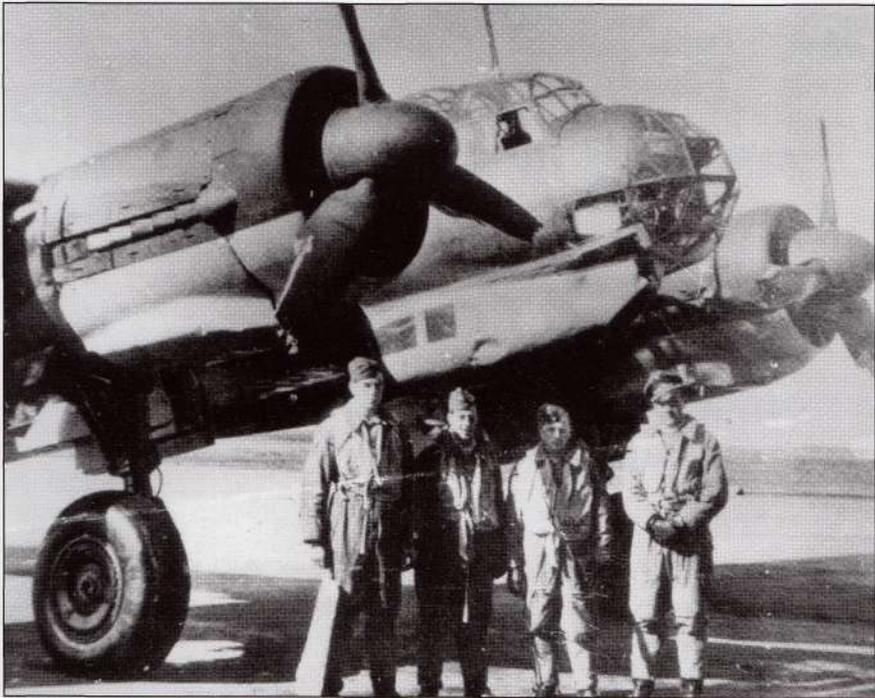
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All other photographs are from the author's collection.

Author's dedication

To 3446177 Corporal James W. Gardner, Lancashire Fusiliers & REME, 1932–45.

An infantry section commander, Jim once described one of his men to me as 'the best up-and-down fighting man I know'. Although I never saw Cpl Gardner in action, I have witnessed his painful daily struggle against ailing joints and advancing years, borne without complaint and with such dignity. I can say with certainty that Jim Gardner is 'the best up-and-down fighting man' I know. It is the greatest honour and privilege of my life to be his mate.



James Gardner (27/7/1914–31/12/2004)
Palestine 1934–35, Shanghai 1935–39,
with the BEF 1939, Dunkirk 1940,
Western Desert 1942–43, NW Europe 1944–45.

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KAMPFFLIEGER: BOMBER CREWMAN OF THE LUFTWAFFE 1939-45

INTRODUCTION

The death of Generalleutnant Walter Wever in June 1936 effectively sealed the fate of the Luftwaffe bomber arm. As Chief-of-Staff, Wever foresaw the need for a long-range Luft-operationsarmee (strategic air army) capable of destroying an enemy's industrial heart. His successor, Albert Kesselring, instead evolved a vast fleet of general-purpose medium bombers, functioning primarily in the operational role. This was a kind of 'tactically strategic' force, intended only to cripple enemy communications, supply lines and industry just long enough to influence the outcome of a specific offensive.

The purely tactical operations would be covered by the *Sturzkampfflugzeug* (dive-bomber), in which the high command invested near total faith. High-altitude bombing was considered costly and imprecise, with much, if not all, of the bomb load falling wide of its intended target (as later evidenced by the comparatively messy Allied bombing patterns). The Stuka offered far greater accuracy in return for a modest outlay in aircraft, ordnance, fuel and personnel, and almost eliminated the risk of damaging non-military areas. Convinced of its war-winning properties by operational trials in Spain, the Reichs Luftfahrt Ministerium (air ministry) cancelled all long-range bomber developments in favour of the Stuka. Dive capability became a prerequisite of all future bomber designs, and was eagerly applied to anything that might be capable of withstanding such extreme manoeuvres; even existing heavy-bombers were modified and tested, often with predictably tragic results. Consequently, the *Kampfgeschwadern* (bomber squadrons) were only ever equipped for rapid, but ultimately unsustainable, victory.

Kampfflieger (bomber crewman)

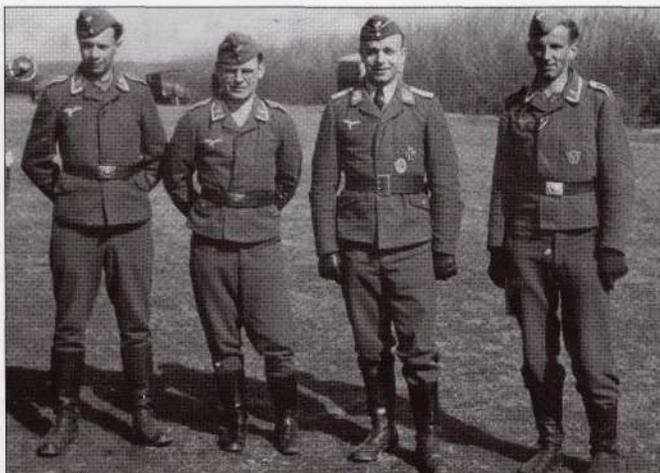
Typically aged 18-21, the earliest recruits were drawn from military families of good breeding, usually the sons of Prussian career officers. Other promising recruits came from army and naval training academies. Officer-cadet Hajo Herrmann was personally invited by Göring himself (while mounted on horseback), as he crawled through an infantry exercise

'If I were to depict the face of a Hun airman ... I should paint a half-witted, leering, vicious face, chosen from the denizens of a lunatic asylum, roaring with laughter as it tosses out its missiles ...' words attributed to 'Archbishop Partridge of Portsmouth', in *Der Adler* magazine, 1940. In reality the Luftwaffe *Kampfflieger* was little different from his Allied counterpart. Far from home and missing his family, he too served his country, simply hoping to get through it all.



in 1935. Once the nucleus was formed, anyone who displayed the necessary level of intelligence, commitment and initiative was considered, regardless of background. This particular branch of the Wehrmacht (armed forces) attracted men of all social, educational and economic backgrounds, from shoemaker to count. While each was shaped by his own unique circumstance, experiences and decisions, they shared a common thread in their desire to fly. While some were immediately captivated by bombers, a large proportion had initially dreamed of becoming fighter pilots. Those found temperamentally unsuited to this vocation were instead redirected to train on multi-engine types. Although initially a disappointment, this was in fact a great compliment to their technical skills. The Luftwaffe saw the bomber arm as the true key to victory, and the best recruits were thus guided to this elite corps. The fighter pilot was an inventive, perhaps impulsive flyer, while service as a bomber crewman demanded a far more deliberate and calculating approach. They soon came to appreciate and enjoy their more interesting tasks.

Some aspired to command, while others were just happy to fly in whatever capacity they could. Whatever their motivation, and however they got there, these highly skilled and versatile men formed the very backbone of the offensive air arm and took great pride in the fact that they were *Kampfflieger*.



Kampfflugzeug crew, c.1940–41. The need for spectacles initially eliminated a man's chances of aircrew service, but wartime needs led to a very slight relaxation in this ruling. The fact that the observer, an Oberleutnant, greatly outranks the Unteroffizier pilot may seem surprising, but such combinations were not uncommon.

CHRONOLOGY

1 March 1935	Luftwaffe publicly announced, new uniform adopted.	22 June 1941	Operation <i>Barbarossa</i> , the invasion of Russia, is launched.
13 August 1936	First bombing, two Ju52s damage Spanish Republican cruiser <i>Jaime I</i> .	23 April 1942	Retaliatory 'Baedeker raids' commenced against historic British cities following Lübeck raid.
Jan–Feb 1937	Debut of Do17 and He111 with Legion Condor.	28 June 1942	Operation <i>Blau</i> , advances into Sevastopol, Caucasus and Don regions.
February 1938	Debut of Ju87, attack Teruel, Spain.	July 1942	Debut of only four-engine long-range bomber, He177.
1 May 1939	<i>Kampf-</i> and <i>Stukageschwadern</i> raised from existing <i>Gruppen</i> .	5 July 1943	Operation <i>Zitadelle</i> , the Kursk offensive, begins.
26 September 1939	Debut of Ju88, attack on HMS <i>Ark Royal</i> and <i>Hood</i> .	21 January 1944	Operation <i>Steinbock</i> , limited reprise of campaign against Britain.
13 August 1940	'Adler tag' (Eagle Day), campaign to destroy RAF.	21/22 June 1944	200 He111s of KG53 and 55 destroy 47 USAAF bombers and 15 fighters on Poltava airfield, Russia, following Berlin 'shuttle-raid' from UK.
30 August 1940	Ju87 withdrawn from Kanalkampf due to unacceptable losses.	December 1944	Debut of world's first jet-bomber, Ar234.
December 1940	Arrival in Mediterranean.	7 March 1945	Ar234s commence ten-day attack on Remagen Bridge.
16 January 1941	Bombing of Malta begins (becoming the most bombed area on earth).		
6 April 1941	Operation <i>Marita</i> , simultaneous invasions of Yugoslavia and Greece.		
31 May 1941	Accidental bombing of Dublin. German government later pays compensation to Eire government.		

RECRUITMENT AND ENLISTMENT

Politics undeniably played a major role in the lives of everyone in 1930s Germany (insofar as they could hardly be avoided or ignored), but contrary to Hitler's claim of having 'a National Socialist air force', the average *Kampfflieger* held little or no particular interest in such matters, outside their immediate effect upon his family and way of life.

Having been completely dissolved after the First World War, the Luftwaffe had nothing to inherit from the old Reichswehr, and so this branch of the armed forces naturally had to be regenerated under government sponsorship. In that respect, it was indeed a National Socialist air force, but few men joined for political reasons. Whether they condoned, despised or were ambivalent toward Nazi policies, most believed that the NSDAP (**N**ational**s**ozialistische **D**eutsche **A**rbeiter**p**artei, or NS German workers' party) offered Germany her best hope of economic recovery. On a personal level, it would grant them their only realistic chance of fulfilling their desire to fly. A degree of National Socialist affiliation, therefore, seemed a small price to pay for this privilege.

The miseries of depression, hyperinflation and Allied repression throughout the 1920s drove many to seek an escape. They found it in the skies. Initially, model aeroplane clubs were formed by small groups of enthusiasts, soon growing into a popular and cheap hobby, with countless meetings and distance-flying competitions later organized throughout the Reich. Design, experimentation and construction of these models provided a sound understanding of basic flight principles, and several innovative ideas were thus born. Many future aircraft engineers shared this background. The progression to gliding schools (*Segelschulen*) quickly followed and flying became almost a national pursuit, indeed, an obsession, with some 4,000 gliding clubs and fields blossoming across Germany and Austria. Instructors were generally First World War Fliegerkorps veterans. Flying provided German people with the physical and spiritual means to leave their troubles on the ground, and there was never a shortage of applicants. The government enthusiastically encouraged membership, and soon formed the Deutsche Luftsportverband (German air sports association), an overtly paramilitary gliding and powered flight organization that would nurture the nucleus of the Luftwaffe.

The covering organization for the fledgling air force was the Lufthansa Verkehrsfliegerschule (commercial flying school) founded in Berlin. The examiners could afford to be extremely selective and failure rates were often above 90 per cent. During 1932 for example, over 4,000 had applied for pilot training. Following the ten-day course of entrance exams, just 18 were accepted (one of whom was the 20-year-old Adolf Galland, later one of the finest aces of the Second World War). This deliberate and far-sighted policy ensured that the future Luftwaffe would be built around a truly elite core; only the very best were available to form the pre-war and early wartime *Geschwadern* (squadrons).

Conscription

Publicly announced 16 March 1935, the conscription of all German males between the ages of 18 and 26 for compulsory military service was ratified

by the official Wehrgesetz (Military Service Act) that followed on 21 March. Conscripts were initially required to serve for one year, but this was extended to two years from 24 August 1936. Older men, aged between 27 and 35, were evaluated for training in the Ersatzreserve I (Primary Replacement Reserve). This training, broken into several five to eight week periods, usually totalled 28 weeks. Upon completion, these men could be advanced to *Unteroffizierschule* as NCO candidates.

The arrival of the *Kriegsbeorderung* (call-up paper) did not, however, mean immediate enlistment. Prior to his commencement of military service, from the age of 17 years, every man was obliged to fulfil *Reichsarbeitsdienst* (Labour Service duty), the purpose of which was two-fold. During the six-month compulsory service, he would be actively involved in the construction of public facilities, monuments and *Autobahn* motorways. In later years, Allied air raids diverted efforts away from building a model European nation, to rebuilding the existing one. RAD service typically involved the reconstruction of bomb-damaged factories and constant improvements to *Festungs Europa* (Fortress Europe) coastal defences. In addition to preserving and protecting the Reich, RAD duty greatly enhanced fitness and stamina among the military-aged male population, preparing them both physically and mentally for service life. Essentially, this was basic training, during which the future recruit took part in regular route marches and sporting competitions. He mastered the rudiments of foot drill and even the manual of arms, through the slightly peculiar *Spatenexerzieren* (spade drill), often considered more difficult than rifle drill proper. Herr Walter Glomp recalls that the soldier had to remember to rotate the shovel sufficiently 'to avoid striking his own head and shins with the blade'.

The conscript had no choice in the path his military service would take, but was posted in accordance with prevailing Wehrmacht requirements. With the start of war, the two-year time limitation was suspended and conscripts (along with everybody else) were obliged to serve for the duration of hostilities. The wartime conscript could still volunteer for extended duty (from four-and-a-half years to 'lifetime' service), beyond the cessation of war, although such a desire could only be voiced during his first two years of service. Those electing for a post-war career greatly improved their prospects for promotion.

Men who voluntarily enlisted prior to National Service age, or for a longer period than required by law, enjoyed the privilege of the choice of arm in which they could serve, and could even specify a specialist unit (such as tanks, submarines, aircrew, for example). Specific service could not be guaranteed, however, and those fortunate enough to reach their desired posting were still subject to appropriate medical and aptitude tests. The very act of volunteering revealed an acceptance of military discipline, and these men were generally rewarded with a significantly reduced RAD service requirement of as little as two months.



German youths were enticed to the bomber arm by songs such as *'Stuka Vor!'* (Stukas up front!), *'Rot Scheint die Sonne'* (Red shines the sun) and the urgent *'Bomben auf England!'* (Bombs over England), a song hated by battle weary aircrews for its jingoism. Cinematic epics such as *'Feuertaufe'* (Baptism of Fire), *'Kampfgeschwader Lützow'* and *'Stukas'* were extremely successful recruiting vehicles.

Mannschaften (other ranks) who had already signed up for an agreed duration of at least four-and-a-half years (prior to the introduction of conscription) were only classed as career soldiers after two years' service. Service with the old Reichswehr (imperial defence), Fliegerschaft (flying service) or the police forces prior to 1 March 1935 was counted toward this obligation.

Those who wished to serve as *Unteroffiziere* (non-commissioned officers) had, since the time of the Reichswehr, been required to sign up for at least 12 years' service. This could originally be extended, in two-year increments, up to 18 years, but this option was suspended in October 1939. NCOs who were technically eligible for discharge due to pre-war service could not be released during wartime unless considered unfit.

Career officers were required to sign up for an unspecified period of service, with each officer rank carrying its own obligatory retirement age. An officer could be discharged, in peacetime only, if he was considered unsuitable for promotion to the next grade. The maximum retirement age was 65 years.

The recruits' previous *RAD* service greatly eased the instructors' task, but there might still be an 'Uhrmacher' (clockmaker) among them to make repeated mistakes. Others became 'Bettenbauer' (bed-makers), akin to the American GI chant, 'he found a home in the army!' Close-order drill ensures full concentration, as the consequences of one man breaking step would be extremely messy.

CONDITIONS OF SERVICE

Accommodation and food

General living conditions within a home *Kaserne* (barracks) were usually very good. The six-man *Stuben* (rooms) were adequately furnished with a table, chairs and iron-framed beds, with sheets and blankets, spaced a regulation 80cm apart (the width of each man's locker). A *Stubenälteste* (senior man), appointed from each *Stubenbelegschaft* (room complement), was directly responsible to the *Staffelkapitän* for his comrades' adherence

to daily orders, duties and room cleanliness. Communal ablutions rooms (with hot water) boasted several large wash fountains, showers and sometimes baths.

Meals were generally of a good standard, although portions were reduced under wartime restrictions, freeing supplies for fighting troops. For *Essenaugabe für Frühkost* (early watch, i.e. breakfast) one could expect bread rolls, coffee and preserves, while main meals tended toward soups and casseroles, usually with a high potato content. Sausages naturally featured in the weekly diet, which included the traditional *Sonntagsbraten* (Sunday roast) of beef with vegetables. Flieger Gerhard Adam found his rations sufficient, 'but the young are always hungry, we could have eaten more'.

Time off and discipline

The limited leisure time was usually filled by writing letters home, or playing billiards and the ever popular card game *Skat*. Some continued their model-making hobby, the more accomplished craftsmen often producing recognition models. Several bases provided facilities for photography, reading and various artistic pursuits, and perhaps a gymnasium. Men of a musical or thespian bent naturally gave impromptu performances





Well-armed pay clerks collect wages from the *Rechnungsführer* (pay master), Crete, May 1942. Note the special lockable cases, heavily embossed '*Eigentum Luftwaffe*' (air force property), carried by the sergeants for secure transportation of currency. The *Tropenhelm* (topees) here appear to be the olive-green *Heer* (Army) pattern, fitted with Luftwaffe insignia, issued to air force personnel prior to adoption of their own version.

for roommates and were frequently cajoled into organizing concert parties (painfully familiar to most servicemen). Frontline bases were regularly visited by travelling libraries and bookshops, music or theatre companies and occasionally even mobile cinemas. In 1939 Göring barred all servicemen from smoking in public and although available in the *Kasino* (mess), alcohol was strictly rationed, with excessive drunkenness resulting in up to 48 hours' incarceration. Even when relaxing at an off-base bar, the need for sobriety in the morning meant things rarely got out of hand.

For those who did transgress, typical punishments included extra duties, confinement to barracks and, during flight training, push-ups and airfield laps with parachutes strapped to their backs. Untidiness, lateness or dereliction of duty drew similar punishment, with more serious offences invoking temporary pay deductions or leave cancellation. Discipline was firm but essentially fair, and most men came to respect and value their NCOs for their even-handedness.

Pay

Luftwaffe personnel were paid on or about the 10th, 20th and 30th of each month. The airman's *Besoldung* (salary) comprised many elements and varied greatly, depending on allowances and conditions. Besides his *Grundgehalt* (basic salary), during peacetime or non-active service, he might receive *Wohnungsgeld zuschutz* (lodgings allowance), to cover accommodation where billeting was unavailable. Personnel stationed in Berlin, Hamburg and Vienna received an additional *Örtliche Sonderzuschlage* (regional special surcharge), at three per cent of the basic wage, because of the higher cost of living in those cities. Specialist qualifications might entitle him to *Gehaltz-Zuschutz* (pay contributions), whereas disciplinary fines or service loan repayments were covered by *Gehaltz-Kürzung* (pay deductions). *Berufssoldaten* (professional soldiers) were subject to a one per cent *Lohnsteuer* (income tax), calculated on a *Tagesatz* (daily rate) and deducted on payment days (50 pfenning per diem for *Flieger*, 75 pf for *Gefreite*, etc.), but this did not apply to wartime conscripts.

Based on mid-war scales, the average *Flieger* started on 65 Reichsmarke (RM) per month, while a *Gefreiter* made 77 RM and an

Obergreiter 98–105 RM. By the time he made Hauptgreiter, his income had almost doubled to 118.70 RM.

NCOs of Unteroffizier and Unterfeldwebel rank made around 128–160 RM and 170–180 RM respectively. Feldwebeln received a modest increase to 195 RM, whereas Oberfeldwebeln took just 5 RM more. A Hauptfeldwebel was originally paid the same as an Oberfeldwebel, plus a 5 RM monthly bonus (totalling 205 RM), but in May 1942, his basic was raised to 250 RM and the bonus system scrapped. The Stabsfeldwebel earned between 212.50 and 244.50 RM per month after 13 to 18 years' service.

Officers' pay scales featured a notable stepped system, producing a degree of overlap with wages of some higher or lower ranks. The lowest-grade Leutnant curiously received the same pay and allowances as an Oberfeldwebel, while the remaining six grades rose in increments, of around 25 RM each, to 300 RM. The lowest of four Oberleutnant grades started on 283.34 RM, again rising in 25 RM steps to 350 RM. Three Hauptmann grades rose neatly from 400, to 500 and 575 RM, while a Major enjoyed a respectable 641.67 to 700 RM per month. The highest-paid 'frontline' officers were Oberstleutnant on 808.34 RM, and Oberst with 1,050 RM.

A man's precise grade was chiefly dictated by the number of children he had. In military service he was fed, clothed and housed by the Wehrmacht, and the state family allowance was therefore reduced by ten per cent. Child benefits were also reduced according to the size of his family; by six per cent for one or two children, or three per cent for three or four, but these deductions were amply compensated for by military *Kinderzuschlag* (child allowance), based on a percentage of his lodgings allowance. As a reward and incentive to procreation (supplying more Aryans for the Reich), families of five or more incurred no reduction to state benefits. If wounded and hospitalized, a 10–20 per cent contribution was deducted, toward the cost of treatment, medical supplies, food and laundry. A wounded general officer could expect fees of up to 35 per cent.¹ In the event of death, the airman's family would still be well cared for, with a pension, child and housing benefits being paid directly to the widow.

Wehrsold (active service pay), nicknamed '*Kopfgeld*' (head money) since the First World War, supplemented basic wages, along with *Kriegsbesoldung* (war pay) for frontline duties. On top of all this would be the *Fliegerzulage* (flight pay); as pilot Peter Spoden recalls, crews received 'I think about 50 Marks or so per month, but we fellows were not interested in money in those days'. He does add, however, that 'for every take-off we got a '*Start-Ei*' ('egg') until the end of the war. That was more important.' Limited opportunities to spend this pay meant the greater part was usually sent home. When Herr Spoden returned to post-war Munich from POW camp, he was able to withdraw 'several hundred devalued Reichsmark, worth a few cigarettes on the black market'.

Leave

Kampfflieger were entitled to at least 14 days' annual leave, though depending on operational demands and personal circumstances, more

¹ As an interesting aside, it took two years for a Flieger to earn what the lowest-paid Generalmajor made in one month.

could sometimes be arranged. Before the invasion of Russia, *Urlaubsschein* (leave permits) for up to two weeks' Christmas leave were occasionally still possible. Seriously wounded men automatically received *Genesungsurlaub* (convalescence leave) following hospital treatment, and by 1943 emotionally exhausted airmen could be granted *Erholungsurlaub* (recovery leave) of up to one month. Families left behind often faced equal dangers to frontline soldiers and *Sonderurlaub* (special leave) was only granted to men stationed within a reasonable distance of home, and only upon the death of a parent; it was not deducted from normal leave allowance.



Women

Besides *Luftwaffenhelferinnen* (female auxiliaries), opportunities to meet women were limited to brief off-duty periods in local villages. It was seldom difficult for air crewmen to attract attention, and predatory girls soon learned to recognize the distinctive qualification badges, unsurprisingly gravitating toward pilots. (Many new pilots were disappointed to learn they were not officially aircraft commanders, but quickly realized that most others made the same assumption.) Where leave restrictions prevented travel home, wives or girlfriends could sometimes journey to nearby towns for a few days together, although none were permitted on base for security reasons. Men who had already found their sweethearts often felt it prudent to await peace before making serious commitments. For those who chose to marry immediately, group weddings were often arranged. After the usual investigations into the future brides' racial purity, several airmen would be granted a short pass (of a few hours) to wed before returning to duty. For those overseas, this was simply not possible and so many had to make do with a *Ferntrauung* (long-distance wedding service), conducted over the telephone. Enforced separation tested any relationship, and some airmen inevitably discovered a girlfriend, fiancée or even wife had taken a new beau. Incidentally, from 30 November 1935, non-membership of the NSDAP was legally recognized as grounds for divorce.

Promotion

The Luftwaffe was highly selective, and for the average recruit, the likelihood of achieving a commission from the ranks was particularly slim. Although a comparatively new service, the Luftwaffe suffered from a privileged hierarchical system more akin to that of the Kaiser's army a generation before. The majority of original staff and flying officers were drawn from army and navy professionals, who brought many of their traditions with them. Regular officers were 'elected' to their ranks by fellow candidates in a passing-out ceremony. They were contemptuous even of reserve officers, so the sight of enlisted airmen achieving success frequently provoked much resentment and envy.

Originally comprising some 400,000 personnel, over 3,400,000 people served in the Luftwaffe by 1945. Rapid expansion demanded swift construction of suitable billets. Duck-board pathways prevented heavy foot traffic reducing fields to mud. An Unteroffizier oversees the cleaning of tar-paper huts, c.1940. The final daily duty was the vigorous polishing of marching boots and belt.

An ambitious junior air crewman would first have to court the appropriate social circles if he was serious about promotion. That said, many more egalitarian officers withstood opposition and ridicule from their peers to help a protégé. Yet once promoted, acceptance was generally swift and complete. This lamentable air of snobbery persisted well into 1941, but was steadily eroded by field promotions, necessary to replace high officer casualties. To address these losses, from 1940 only one officer was permitted per crew. A gradual levelling of rank disparity between pilot and observer took place, Oberfeldwebeln becoming more prevalent among both. In practice, a man's rank was almost irrelevant. Position was based entirely upon ability, and Leutnante were frequently appointed Staffelfkapitän over higher-ranking officers. This policy ran throughout operational structure, creating the peculiar situation in which an Unteroffizier observer would have 'command' over an Oberleutnant wireless-operator in flight, but reverted to normal subordination on the ground.

Details of pay, leave and promotions were recorded in the *Soldbuch* (pay book), along with enlistment, training, inoculations, uniform, awards, optical and dental examinations. Reflecting heightened security demands, the holder's photograph was fixed inside the cover from 1943. A red pencil strike across the front of the *Soldbuch* indicates cancellation, the soldier either a POW or deceased (Plate A1).

TRAINING

From 1935 the main priority of the Luftwaffe was to supply itself with pilots, a priority very much reflected in its recruiting system. The raw conscript would first be assigned to a Flieger-Ersatzabteilung (airman replacement battalion; Fl.Ers.Abt.), where after an introductory tour of the camp, uniform issue and a *Vereidigt* (swearing-in) ceremony, he endured tetanus, smallpox, typhus, paratyphoid, dysentery and cholera inoculations, usually all within a week or two. In addition to the time-honoured regime of foot drill, rifle drill, PT and military discipline, he also learned basic map reading and elementary wireless operation and procedure.

After this six-month induction period was complete, all recruits were reviewed for possible advancement as pilots. Any likely candidates were sent to a Flug-Anwärterkompanie (aircrew candidate company), where they would be evaluated during several tests in basic aviation theory. Those who were deemed unsuitable for pilot training, yet still showed promise as aircrew members, were then sent on to a Flieger-Ausbildungsregiment (aircrew development regiment) or FLAR. Here, they received a further two months of instruction in preliminary navigation, wireless operation, mechanical aviation and gunnery, prior to selection for specialist aircrew training in accordance with suitability and Luftwaffe needs.

A Flugzeugführer-Anwärter boards an Ar66c biplane, c.1939. Instructors were originally assigned four trainees each, but the wartime influx raised the average to six. Although shocking to witness, accidents became an accepted hazard and little time was wasted in getting students airborne again. The 'obsolete' Arado gave remarkably effective frontline service with nocturnal *Störkungkampfstaffeln* (nuisance bombing squadrons) in Russia from 1943.



By the close of 1940, however, it was clear that the early identification and training of these vital aircrew members was just as important as that of pilots. Sixteen months of intensive experience had given Luftwaffe recruiting and training staff the ability to rapidly identify those men most suited to pilot and aircrew training. The system was thus rationalized and compressed (during a broad restructuring of Luftwaffe commands undertaken that December), to enable recruits to embark upon the most appropriate training regime more quickly, and thus enable the Luftwaffe to meet its aircrew personnel demands sooner.

The Flieger-Ersatzabteilung was now bypassed, with all new recruits instead being assigned directly to a Flieger-Ausbildungsregiment, where they would receive some of their basic military training, in conjunction with the preliminary aviation instruction previously detailed. Any potential pilots among them were sent on to undergo the regular selection process within a Flug-Anwärterkompanie, where the remainder of their basic training was completed simultaneously alongside the aircrew evaluation tests. Upon successful completion of the FIAR stage (extended to three to four months by 1943), potential aircrew would progress to the appropriate specialist schools. The remaining personnel not chosen for further flight training would be redirected to a Fl.Ers.Btn. in order to complete their basic training, and thence to an alternative school for a branch most suited to their particular skills and aptitude

Pilot selection

Upon assignment to a Flug-Anwärterkompanie, the *Flugzeugführer-Anwärter* (pilot candidates) received instruction in basic flight theory and rudimentary aeronautics while being assessed for advancement. Those candidates displaying the required aptitude were then put forward to *Flugzeugführerschule-A/B* as soon as a place became available (usually after about two months), to commence flight training proper.

At such schools, officially abbreviated to *F.Z.S-A/B*, but more frequently referred to as '*A/B-Schulen*', the cadet underwent four principal levels of instruction, each requiring qualification for its own licence, before advancement to the next stage. It was these licences, earned over a period of six to nine months, that gave the schools their name. The *A-Schein* introduced the students to basic practical flying in dual-controlled light aircraft, covering take-off and landing, stall recovery, etc., and eventually leading to solo flight. The *A2-Schein* demanded the absorption of a great deal of theory, including aerodynamics, meteorology, flying procedures and aviation law, in addition to the practical application of aeronautical engineering, elementary navigation, wireless procedure and Morse code. On top of all this, they gained more flying experience on larger single-engine aircraft. The next level, the *B-Schein*, required progression to high performance single- and twin-engine machines, usually with retractable undercarriage, including



Trainee Beobachtere (observers) hold course over a motorized travelling landscape. Each must select and 'strike' various targets by pulling a wooden lever to his left, firing the bombsight camera shutter, and capturing an image with superimposed cross-hairs to verify his accuracy. Gearing enables instructors to complicate this task by applying realistic lateral drift. A defused lamp suspended beneath the gantry simulates moonlight for night-bombing exercises.



Bordfunker (signalmen) students transcribe a rapid succession of messages in a Morse decoding exercise. All crewmen had to memorize the phonetic alphabet for correct radio procedure:

Anton - Berta - César - Dora - Emil - Friedrich - Gustav - Heinrich (or Henry) - Ida - Julius - Kurfürst - Ludwig - Marta - Nordpol - Otto - Paula - Quelle - Richard - Siegfried - Toni - Ulrich - Viktor - Wilhelm - Xavier (or Xenophon) - Ypsilon - Zeppelin.

some older types of combat aircraft. Acquisition of the final *B2-Schein* depended upon the cadet's satisfactory accumulation of between 100 and 150 hours of flight time, some 14–17 months after his induction. In late 1940, however, the *A/B-Schule* training programme was updated to take account of wartime demands for more pilots. The schools maintained the high initial selection standards, simply because of the vastly increased number of enthusiastic volunteers from which to choose, but a far greater emphasis was now placed on practical flying skills from the outset. The A2 licence was dropped, and that particular phase of the training amalgamated

into the remaining licence grades, with the A-licence generally taking three months to complete. The B1 brought the students into contact with advanced single-engine planes, while the B2 consisted of advanced navigation and the introduction to twin-engine aircraft.² An elementary K1 '*Kunstflug*' (stunt-flying) aerobatics course was included, to provide all new pilots with a good understanding of rudimentary evasive manoeuvres (such as barrel rolls, loops and splits). This also enabled instructors to readily identify any potential fighter pilots among their students, who thereafter received more flying time than their fellow cadets. Upon completion of the B2 phase the cadet would at last be granted his *Luftwaffenflugzeugführerschein* (air force pilots' licence), accompanied by the highly prized *Flugzeugführerabzeichen* (pilots' badge) – his 'wings'. After an average of ten to thirteen months at *A/B-Schule* he was now, finally, a fully qualified pilot.

Pilot specialization

It was at this juncture that the new pilots were categorized for service on single- or multi-engine aircraft, and here the training paths divided. Each was assigned to a specialist flying school, where he would undergo intensive training for his allotted aircraft type and duty, with potential fighter and ground-attack pilots being sent directly to *Jagdflieger-* and *Schlachtflug-Schulen* respectively.

Those selected for dive-bomber training proceeded immediately to *Sturzkampffliegerschule*. Potential Stuka crewmen had to endure around 15 physically demanding and nerve-wracking test dives (as passengers), to confirm their suitability for continued training. Those for whom the stresses proved too great were generally transferred to *Transportfliegerschulen*, eventually serving with *Kampfgeschwadern zur besonderen Verwendung* (battle wings for special purposes, i.e. transport). The *Stuka-Schulen* differed tremendously in their methods. Some commenced dive-training almost immediately, while others waited until around 100 hours of additional formation flying and aerobatics had been accrued. The four-month training period (or sometimes, up to a year) mainly concentrated on accuracy in various dive approaches, but also included extra navigation and flight theory, with approximately 50 hours of flying time.

² It must be noted that the many schools differed greatly in both method and available aircraft types and that, seemingly, no two pilots underwent exactly the same training schedule.

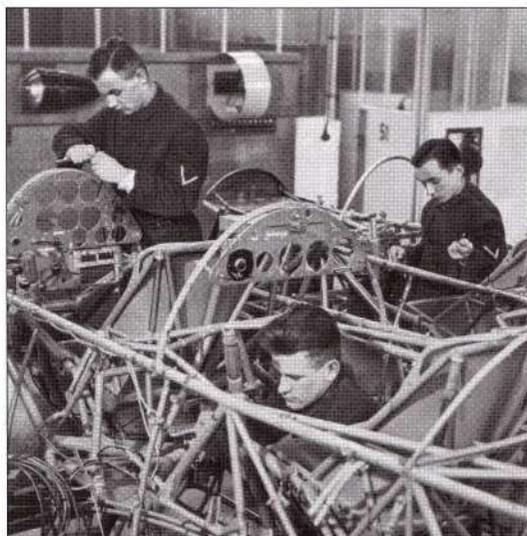
Pilots destined to operate twin-engine aircraft did not immediately advance to their own specialist schools, however, but were instead sent on to *Flugzeugführerschule-C* or '*C-Schule*', often sharing location and airfield with a regular flight school. Here they received advanced instruction in instrument and astronomical navigation and the use of electrical and radio direction-finding equipment. They studied the complexities and handling characteristics of multi-engine aircraft, including 50–60 hours of flight time (rising to 70 hours by 1941), for which they were taken up in small groups and rotated; as one took his turn in the pilot's seat, a fellow student operated throttle levers under instruction. During the course, which lasted anything between two and six months, pilots spent several hours on 'link' simulation trainers (allowing them to get hopelessly 'lost' and recalculate complex headings, without wasting valuable fuel).

Following *C-Schule*, the men were assigned to a separate *Blindfliegerschule* (blind flying school), for a four- to six-week advanced course in instrument navigation and dead reckoning, with some 35–60 hours' flight time. When they eventually graduated around 20 months later, these pilots were among the most highly trained specialists within the Luftwaffe. With an average 300 flying hours behind them, they were ready to proceed to their final schools for advanced training in one particular discipline (bomber, transport, reconnaissance or heavy-fighter).

Details of every flight, including aircraft type, duration and purpose, were recorded in the personal *Flugbuch* (log book), maintained throughout (and occasionally beyond) the pilot's military service (Plate H1).

Aircrew selection

Upon completion of basic training, each fresh crop of recruits was posted from the numerous Fl.Ers.Abt. to the most appropriate branch schools of the Luftwaffe, in accordance with individual ability and manpower needs. The vast majority were inducted into the Flak artillery. It was always possible to request a specific branch, however, according to taste or perhaps family tradition, and there was never any shortage of willing volunteers for pilot training, among them many groups of friends who requested postings together. Despite their enthusiasm, nothing was guaranteed, and the greater proportion of these hopefuls were unsuccessful in their first application. That aside, those still determined to fly could request consideration for training as another, equally vital member of an aircrew. Added to this pool of volunteers was the large number of ex-pilot-cadets who had 'washed-out' from A/B schooling. While they had failed to meet the requirements to qualify as pilots, they were not simply discarded from the flight branch, but were instead re-routed with the other volunteers to a Flieger-Ausbildungsregiment. Here, they went through the standard two months of preliminary aviation training, while being evaluated for advanced training in one specific discipline, and were then posted to the



Bordmechaniker (flight mechanics) gain practical experience as *Flugzeugelektriker* (aircraft electricians) at a dual-control trainer assembly plant. Although his technical skills were severely curtailed in flight, the engineer's familiarity with engine characteristics enabled him to rapidly assess performance and advise the pilot when nursing a damaged machine. (Hayley Morris)

specialist school most appropriate to their abilities. As aircrew shortages began to present serious problems around the mid-war period, personnel already serving in other branches of the Luftwaffe could be offered an aircrew evaluation test, even though they may never have previously considered such a vocation. Men with above average signalling skills were often drawn from the Luft-Nachrichtenregimenter (air signals regiments) to retrain as *Bordfunke* (flight signalmen). A large number of serving ground-crewmen had previously failed aircrew selection and longed for such duties.

Aircrew specialization

Observer

Men chosen to fulfil the many complex duties of *Beobachter* originally attended *Navigations-* or *Aufklärungs-Schule* (reconnaissance school) until the formation of four dedicated *Kampfbeobachterschulen* (battle observers' schools) in autumn 1942. During their nine- to twelve-month stay, they became proficient in navigation, cartography and map reading, photography, basic gunnery and aerial tactics. They learned to operate all manner of navigational instruments, ranging from simple flight computers to the latest radio guidance systems. Low-tech but effective methods were also employed: sextant-reading practice was carried out in chairs that the instructors shook to simulate aircraft vibration and turbulence. A great deal of time was naturally devoted to bomb-aiming, using *Luft-Bildkamera* (aerial cameras) in place of bomb-sights. In 1937 it was decided that the *Beobachter* would also serve as the 'aircraft commander'. (In practice this was a very flexible title; although *Beobachtere* had overall command in flight, and usually senior rank, all personnel habitually referred to 'the pilot and his crew'.) These men now had to possess suitable authority and leadership skills and therefore attended either *Unteroffizier-* or *Offizier-Schule*, generally graduating as *Feldwebeln* (sergeants) or *Leutnante*.

Flight gear was often worn during gunnery practice to familiarize *Bordschützen* (air gunners) with the restrictions imposed by such bulky clothing. Gunners frequently went rabbit hunting with shotguns (and ferrets) to help develop 'lead' skills against unpredictable targets.



Wireless operator

Trainee *Bordfunkner* were required to undergo an intensive and demanding nine-month course at *Luftnachrichtenschule* (air signals school), alongside trainees destined for service in Flak and other units. They studied ground wireless reception and transmission and had to attain a proficiency in Morse code of at least 100 letters per minute (sending and receiving). They also mastered theoretical navigation and instrumentation, but were sent to another school (with airfield access) for actual flight experience and practical navigation, map reading, and radio direction-finding exercises.

Flight mechanic

The trainee *Bordmechanik* learned his trade at *Flieger-technischeschule*, over a period of around nine months. He studied internal combustion engine theory, elementary aerodynamics, and gained practical experience on many types of aero engines. Students were sometimes sent to work at aircraft factories for practical experience. Although this may have initially seemed slightly demeaning, it gave them invaluable and detailed experience of various aircraft systems, as well as inside advice from the factory engineering staff themselves, for which the 'Bord-Wart' and his comrades might someday be very grateful. (The various 'Wart' nicknames were derived from *Wartung*, meaning maintenance.)

Air gunner

Bordschützen perfected their craft at *Fliegerschützenschule* (re-named *Bordschützenschulen* from January 1942), during a rigorous five-month marksmanship and gunnery course. This involved a great deal of range work and familiarization with small arms and machine guns of various types, principally 7.92mm Mauser rifles and the infantry version of the MG-13. Regular 9mm pistol shooting helped maintain rapid sighting accuracy. After camera gun practice on trainer aircraft, they progressed to air-to-air machine gunnery against towed targets (which many found particularly enjoyable), firing tracer-ammunition as an aid to developing 'lead' skills. Assessed by instructors, they tracked obsolete fighters in dummy passes, but later progressed to Me109 'attacks', which forced home the startling reality of modern fighter speeds.

A high degree of cross-training was incorporated into each curriculum, with every crewman receiving instruction in navigation, radio-telegraphy and aero engine principles. This would enable crews to remain effective in the event of casualties. Even after a long day's training there was plenty of homework to be

Engendering esprit de corps, trainees sing as they return to barracks. Crews assembled at Grosskampffliegerschule generally remained together, but on very rare occasions a pilot or observer might request the transfer of an individual if he lacked confidence in his suitability. For any crew to remain cohesive, it was vital that they at least liked each other.



done, with virtually every waking hour devoted to learning every aspect of their trade. The *Bordmechanik*, *Bordfuncker* and *Bordschütze* generally held relatively junior grades, the majority serving as *Gefreite* or *Unteroffiziere*.

It should be noted that the numerous trade schools were not always autonomous establishments, but were commonly housed within shared bases, airfields and buildings. Furthermore, they routinely shared aircraft and even flight time. Groups of student pilots, observers and gunners (each with their respective instructors) squeezed aboard the same aircraft for simultaneous training.

To alleviate frontline fuel shortages, training school supplies were cut by almost half in 1942. Consequently, pilots began qualifying with drastically reduced flight time, usually reaching an operational unit with between 220 and 270 hours. Accident rates duly rose, with an average of 14 per cent of training aircraft destroyed annually, and eight per cent of flights ending in fatalities. The various training programmes were steadily compressed still further to cover the resulting replacement deficiencies; the *Beobachter* course was reduced to six months or less, sometimes incorporating less than 70 hours' flight time.

Upon completion of the specialist training, each man was awarded an aircrew licence, *Fliegerschein* (Plate A2), accompanied by the appropriate aircrew badge. The qualified crewmen were then dispatched to one of five *Grosskampffliegerschulen* (higher bomber schools), numbered 1–5, established at Tutow, Hörsching, Greifswald, Thorn and Parow respectively. Wireless operators among them might alternatively be sent for dive-bomber training at a *Sturzkampffliegerschule*.

APPEARANCE AND EQUIPMENT

Service dress and insignia

In general appearance the *Kampfflieger* differed little from his comrades in other branches. Headgear consisted of the peaked *Schirmmütze* (see Plates B3 and B4), the *Fliegermütze* side cap (Plate D) and latterly *Einheitsfliegermütze* field cap (Plate G). A four-pocket *Tuchrock* wool tunic and *Tuchhose* trousers were issued for everyday wear (Plate B2), while the *Fliegerbluse* (plates B3 and B4) was reserved for flight duties. By 1942, production of the former had virtually ceased and men were instead issued two *Fliegerblusen*, with one reserved for parade and *Ausgehanzug* ('walking-out' dress). In everyday *Dienstanzug* (service dress), no undershirt was to be visible. Officers and senior NCOs frequently purchased high-quality versions of these items from approved German outlets or civilian tailors in occupied countries, but all non-standard garments required official acceptance prior to wear. Flight branch uniforms, for both air and ground personnel, were denoted by *Goldgelb* (golden-yellow) *Waffenfarbe*. This 'arm colour' took the form of piping to the *Schulterklappen* (epaulettes) worn by NCOs and enlisted men, and underlay to officers' rigid *Schulterstuke* (shoulder boards). It also formed the body cloth of the distinctive *Kragenspiegel*n (collar patches).

A few units were distinguished by the wearing of *Erinnerungsbänder* (commemorative cuff titles) to the lower right sleeve of uniform tunics. Adopted from 1935, these bands recalled prominent figures from Luftwaffe history; KG1 'Hindenburg', KG4 'General Wever', KG27

'Boelcke' and KG53 'Legion Condor' (Plate H2). Unique among the *Stuka-Geschwadern*, StG2 wore the 'Immelmann' cuff title. (Plate A3). Some sub-units produced their own unofficial miniature pocket badges or lapel pins, but the origins and symbolism of most are now sadly lost to history. Perhaps the most famous semi-official distinction was the Edelweiss insignia worn by KG51 personnel. Traditionally the reserve of mountain troops, permission to fix this white metal badge to their headgear was granted on 15 August 1942 by General Lanz, in honour of the tactical support given to his Gebirgsjäger-Division 1 throughout the campaign in the Caucasus.

Aircrew badges

A series of *Militärfliegerabzeichen* (military aircrew badges) was adopted on 19 January 1935, eventually renamed *Luftwaffen-Fliegerabzeichen* on 8 June 1939. Pilots received the *Flugzeugführerabzeichen* and observers the *Beobachterabzeichen* (Plate H3).

The *Flugzeugführer-und-Beobachterabzeichen* (pilot/observer's badge) was awarded for dual-qualification, but holders had to re-qualify for this status annually. Also known as the 'Doppelabzeichen' (double badge), it was identical in design to the pilots' badge, but with the addition of a gold-coloured wreath (Plate H4). Some pre-war pilots disparagingly called it the 'Weder-noch-Abzeichen' (neither-nor-badge). The young Leutnant Hajo Hermann naturally preferred to call his the 'Sowohl-als-auch-Abzeichen' (not-only, but-also-badge).

The clumsily titled *Bordfunker-(Fliegerschützen-) und Bordmechaniker-(Fliegerschützen-)Abzeichen* (Plate A4), sensibly abbreviated to *Bordfunkerabzeichen*, was initially worn by wireless operators, flight mechanics and air gunners. On 22 June 1942 the *Luftwaffen-Fliegerschützenabzeichen* was introduced for flight mechanics and gunners only (Plate H5). Originally made from nickel-silver, they were cast in aluminium-alloy from September 1937. From 18 November 1937, metal badges were officially reserved for everyday dress, while embroidered cloth versions were intended for flight clothing. Although the regulation was frequently ignored, the cloth badges were more comfortable under tight-fitting parachute harnesses and, moreover, prevented unnecessary wear to the inflatable life-preserver. The wartime decline in badge quality was reflected in its presentation packaging, which declined from leatherette-covered cases to cardboard boxes and paper envelopes.

From 13 May 1935, air crewmen not yet fully qualified for these badges wore embroidered cloth insignia, denoting *Fliegendes-Personal* (flight personnel) or *fliegertechnisches-Personal* (flight-technical personnel), on the lower left sleeve (see Plate E).

Awards

The *Frontflugsparange für Kampfflieger* (operational flight clasp for bomber crewmen) was introduced on 30 January 1941, for level- and



Whereas the RAF and USAAF automatically granted pilots the minimum rank of sergeant and 2nd lieutenant respectively (regardless of suitability), this man was clearly considered neither officer nor NCO material, reflecting Luftwaffe policy of separating rank from 'trade'. While Gefreiter pilots were very rare, some even held the lowest grade of Flieger.

dive-bomber crews. The clasp was awarded in three classes: bronze for 20 missions, silver for 60 and gold for 110 (Plate H6, 7 and 8). Operational flights made from 1 September 1939 were considered in these totals, but because of the wide variations in type and duration of missions undertaken, not all were counted. On 22 April 1941, precise criteria were laid down for what constituted a frontline flight: crews were required to venture a minimum of 30 km into enemy airspace, or 100 km overseas (this measurement was taken from German-held borders). It is worth noting that of KG4 pilot Lt Elmar Börsch's first 200 missions, only about eight per cent lasted more than ten minutes over enemy territory (his final total was 312). Flights that took the crewman over enemy territory for more than four hours counted as double, eight hours triple, 12 hours quadruple and quintuple for those in excess of 16 hours. This latter, phenomenal duration was added on 28 January 1944 in respect of ever increasing ranges the bombers were forced to travel to their targets, from drastically receding German frontline airbases. Following the invasion of the Soviet Union, it soon became evident that the original order had underestimated the speed at which airmen could accrue missions, many far exceeding those represented by the current highest-grade clasp. From 26 June 1942, therefore, this golden clasp could be upgraded with the addition of the *Anhänger zur goldenen Frontflugschleife*, a pendant in the form of a star flanked by laurel leaves (Plate H9). When soldered beneath the clasp by a jeweller, the pendant denoted a greatly increased total of operational flights: 300 for bomber and 400 for dive-bomber crewmen. By 29 April 1944, it was realized that even these upgraded clasps were insufficient and, moreover, imprecise; a man with over 600 missions to his credit wore the same badge as those with 'only' 300. A new range of hangers was thus designed to keep pace with each airman's achievements. The *Anhänger zur goldenen Frontflugschleife mit Einsatzzahl* (with operational number) was a simple lozenge, again supported by laurel leaves, displaying black-lacquered numerals appropriate to the missions flown, commencing with 200 and rising in increments of 100 (Plate H10). A unique, diamond-encrusted version of this hanger was presented to Stuka-Experte Oberstleutnant Hans-Ulrich Rudel, marking his 2,000th mission.

Flight gear

Fliegerkopfhäuben (flight helmets) were issued in summer- and winter-weights, designated *LKp S 100* and *LKp W 100* (see Plates A and C). The improved '101' versions, which appeared in late-1940, were fitted with superior communications equipment (Plates F3 and 5), and ridges on the headphone casings held the goggles in place. An extra-lightweight version, the *LKp N 101 'Netzkopfhäube'* with mesh crown, was available from mid-1941 (Plate F4).



This Unteroffizier proudly displays his four-year service medal and 1934-pattern *Fliegerdolch* (flyer's dagger) with blue leather-bound scabbard. Correctly worn squarely on the left hip, it was habitually turned to the fore whenever a camera appeared. Crewmen frequently breached regulations by retaining the *Fliegendespersonal-Abzeichen* sleeve insignia, alongside a metal *Fliegerabzeichen*.

Adopted in 1934, the one-piece *Fliegerschutzanzug* (flight suit), or *Kombination* (overall), featured a distinctive diagonal opening system, a slightly fussy design that greatly eased donning and removal. Its horizontally positioned fly zip was easy to operate with one hand, an important consideration for a busy pilot. However, in its final configuration, from mid-1940, the fly zip was curiously re-orientated to a vertical position, making one-handed operation awkward. The summer-weight *K So/34* underwent numerous modifications, most notably the fitting of Karl Heisler's quick-opening *Reissverschluss* (rip-fastener) to its left side. Winter-weight equivalents included the sheepskin-lined cloth *KW l/33* designated for overland use. A diagonal zip replaced its original button closure in 1940. The leather *KW s/34* provided superior insulation for overseas use. In 1940 a lightweight, velveteen-lined *KW Fl.bR/40*, of synthetic 'Schappe' twill cloth, was introduced for 'aircraft with restricted space'. Although not heated itself, an internal wiring loom transferred current to electrically heated *Heizbare-Fliegerpelzstiefel* boots and *FW m/40* gloves.

In 1941 each version was replaced by a *Zweitelig* (two-piece) equivalent. These eminently practical and comfortable garments provided voluminous trouser pockets for a vast array of survival gear, with a flare pistol holster on the right hip, for which cartridges were now carried in *Patronengurt* straps worn on the calf or the ankle. *K So/41* suits were produced in tan and grey-blue cloth, often worn combined. The sheepskin-lined *KW l/41* had a blue cotton cloth shell, and the *KW s/41* was now in more supple sheepskin. 'Schappe' *KW Fl.bR/41* suits are readily identified by external heating contacts at forearm and upper-calf and the plum-coloured velveteen collar. Special rank insignia, worn on both sleeves since December 1935, were reduced to the left sleeve only in August 1942, but seldom fitted to sheepskin garments. Alternatively, uniform epaulettes were frequently added.

The archaic-looking *Kapok-Schwimmweste 10-76A* (life-vest) could sustain significant damage with no adverse effects, but several unconscious airmen were drowned when its large and very buoyant back panel inverted them in rough waters. The *10-76 BI* version, introduced in late-1940, overcame this danger with a simple yoke harness, and its improved collar could be fastened by the wearer's comrades to support his mouth above water (Plate C1). Despite appearances, these surprisingly lightweight vests were not particularly restricting and remained popular for their comfort, insulation and float characteristics. The inflatable *Schwimmweste-pneumatisch 734* could be activated by compressed air or orally (Plate B5). An early colour change from brown to yellow greatly increased visibility. Its equally hazardous back panel was simultaneously modified in the *SWp 734 BI*. The metal mouthpiece caused several freezing injuries to air crewmen in the north Atlantic, but was substituted by plastic on the *SWp 734 B2* in early 1941 (Plate F5).

The three *Fallschirm* (parachute) types incorporated a quick-release buckle identical to the British Irvin design, resulting from shared pre-war



This Leutnant sports typical officer's attire for the first half of the war, including splendidly flared *Stiefelhose* breeches with *Reitstiefel* boots. Accompanying crewmen wear final and early-1937 configuration *K So/34* flight suits. Evolving throughout its eight-year production, at least ten variations of the *K So/34* existed (seven conforming to regulations).

research. Men requiring unrestricted movement, notably observers and wireless operators, generally favoured the *Fallschirmgurt* harness, to which the *Brustfallschirmpack* (chest pack) was hastily clipped before bailing out. The back-type *Rücken-fallschirm-12B* (Plate A5), supported by a metal tray, was frequently used by air gunners and flight engineers, while medium-bomber pilots invariably used the *Sitzfallschirm 30-IS-24B* (see Plate H). Stuka crews only employed the latter two types. Late-production parachutes utilized dark-green synthetic 'Perlon' or 'Pe-Ce-Werkstoff' harness webbing.

Body armour was not issued, crews relying instead upon strategically placed armour plating within the airframe. Additional plating was often fitted to aircraft by unit engineers, but had adverse effects upon compass accuracy, take-off weight, fuel consumption and flight characteristics. Simply removing the lining from a large-sized standard issue *Stahlhelm* (steel helmet) and gluing horsehair pads inside improved individual head protection. Ground crew engineers later reshaped or cut away the sides to adapt it for flight helmet headphones, but a purpose-designed *Fliegerstahlhelm* was finally introduced in 1944, albeit in limited numbers.



A Feldwebel Flugzeugführer is dwarfed by his Ju87, Russia, 1942. In flight, and even on the ground, it is often difficult to comprehend the scale of the truly enormous Stuka. Its SC250 cargo is here fitted with the rarely seen 'Dinort-Spargel' (asparagus) detonator arm, designed by StG2-Kommodore, Major Oskar Dinort. This improvised device exploded the bomb just above ground level with devastating effect in anti-personnel and vehicle attacks. The 1,000ft average release point ensured minimum safe recovery and reduced target evasion time.

Organization

The smallest autonomous component of a *Kampfgeschwader* was the *Staffel*, comprising a wartime average of between nine and 12 aircraft, generally flown in *Kette* (chains) of three. Three *Staffeln* constituted one *Gruppe*, totalling 27–36 machines, of which four served as the *Stabschwarm* staff element. Four such *Gruppen* composed the *Geschwader*, fielding a total of 108–144 aircraft, with the staff units forming the *Stabsstaffel*. It must be noted that establishments were flexible, with most *Gruppen* raising or disbanding *Staffeln* as conditions dictated.³

Theoretically, 75 per cent of aircraft would remain airworthy, while the reserve underwent routine maintenance. Wartime losses, repairs, equipment and fuel shortages meant that, in reality, only about half were combat-serviceable at any time. Each aircraft required a complete mechanical overhaul after 100 hours' flight time, but operational demands frequently stretched this to 150. *Bodenpersonal* (ground crews) of the *Flughafen-Betriebs-Kompanie* (airfield works company) carried out maintenance. Totalling approximately 150 officers and men, the *Fl.B.K* comprised three *Zugge* (sections) of 30 men under command of a *Zugführer* (section leader), commonly known as the 'Erste-Wart' (first

³ From 1942, operational units were steadily depleted by fuel shortages, and the crews were retrained as Flak gunners for Reich defence.



Produced in greater numbers than any other type (c. 15,000), the Ju88 was the very backbone of the *Kampfgeschwadern*, largely replacing the venerable He111 by mid-1942. Its very narrow fuselage placed all four crewmen literally inches from each other. Although advantageous for cooperation and moral support, one well-aimed burst of flak or cannon-fire could be devastating. (Gregory Pons)

mechanic, or crew chief). Each *Zug* was responsible for the aircraft of one *Staffel*, and generally consisted of 12 *Flugzeugmechanikern* (aircraft mechanics), two *Motorenschlossern* (engine mechanics), one *Feinmechaniker* (instrument mechanic), six *Waffenwarte* (armourers), six *Bombenwarte* (bomb armourers), two *Funkwarte* (wireless fitters) and one *Fallschirmwart* (parachute fitter).

BELIEF AND BELONGING

Throughout the early war years, Reichsmarschall Herman Göring made great efforts to visit every *Kampfgeschwader* and most crewmen saw, if not actually met, him at some point in their careers. The majority found him a comical and slightly ridiculous figure in one of his self-designed and liberally decorated sky-blue uniforms (he often changed several times during each visit). He had the general aspect of a fat, overgrown schoolboy, but was positively brimming with confidence and enthusiasm. Like most airmen, StG3 wireless operator Obergefreiter Hans Wiedemann, 'didn't even talk about him', but what popularity Göring did enjoy soon waned, as increasingly unreasonable demands were heaped upon the *Kampfgeschwadern* and their over-stretched fighter escorts. Directives were issued preventing all leave and rest. Exhausted crewmen could no longer be relieved from operations to recuperate – everyone had to fly. An average of two to three missions was executed per night, regardless of weather conditions, with barely an hour between each. As aircraft were hastily patched-up, refuelled and rearmed, aircrews were debriefed, then re-briefed, and perhaps able to grab a rushed meal before take-off. Oberkommando der Luftwaffe (Supreme Command) grew evermore obsessed with numbers, and seemingly detracted from the limitations of worn-out

men and aircraft. Even inexperienced crews had to join night operations, with predictable results. The combination of tired air and ground personnel, hurried maintenance and unproven pilots operating under strict light discipline, inevitably culminated in disastrous runway accidents and mid-air collisions. Units sometimes lost more men and machines on their own airfield than they did during the mission itself. Nevertheless, confidence in *Geschwader* and *Gruppe* commanders remained high.

Comrades

On rare occasions the *Staffel* might be blessed with an unexpected night off, the mission scrubbed due to the very worst of weather. Having been in a high state of nervous tension all day, the news brought tremendous relief and aircrews seized the opportunity for a celebration. Before long, every man had a drink in his hand, but their restricted alcohol intake made even a few glasses of beer or wine seem more potent. Tired men could only last so long before sleep beckoned and these parties generally wound down as quickly as they started. For that night at least, the spectre of death would not lurk at their shoulders.

Conversely, if mechanical failure or incomplete repairs had prevented a crew from joining the mission, any sense of personal release was tempered by concern for friends on other aircraft. Misplaced feelings of guilt were compounded when comrades failed to return, but ultimately the fatalistic airmen were glad to be out of it.

Estrangement and resentment

Crews routinely spent off-duty periods together, but were not always accompanied by their officers, military protocol dictating two very different relationships in air and on land. While the differences of rank were instantly forgotten and irrelevant in flight, for some crews, as they dismounted, the 'natural order' of officer and other-rank forced its way between them once more. Officers from different crews who had developed particular friendships in the mess would invariably meet to share experiences of the mission. Meanwhile, the non-commissioned and enlisted members of their respective crews, perhaps slightly uneasy in the presence of unfamiliar officers, would likewise gravitate toward each other. Despite the equally close bonds that grew between them, a similar segregation sometimes existed even among Stuka pilots and their gunners. This must not imply any falseness in the depth of their friendships, but was simply the result of proper military behaviour.

By mid-1941, a notable degree of separation was emerging in the relationship between air and ground crews, however. This was in no small part due to the rapid turnover in aircrew (new crews were lost after an average of only three to four missions), leaving little time or inclination for such friendships to develop. Furthermore, the steady decline in training standards meant

The close bonds enjoyed by *Kampfflieger* transcended rank and position. Most conferred closely in all matters, be they operational or personal, while shared experiences and memories of lost friends drew them ever closer. The Luftwaffe had no chaplains and few psychologists, but these were perhaps unnecessary. By far the best counselling men could receive was found in each other's company.



that inexperienced new pilots frequently reported mechanical faults and concerns to the already over-burdened crew chief that, upon investigation, proved insignificant or downright incorrect. Time and effort had by then been expended for no good reason, sometimes removing a perfectly serviceable aircraft from an operation, and leaving the mechanics' opinion of the aircrew significantly marred. The situation was so detrimental to squadron efficiency that attempts were made to reintegrate the two groups by standing-down a crewman from a mission while a ground crewman covered for him. This not only gave the aircrews some much-needed rest, but also allowed the mechanics to evaluate aircraft systems, defences and shortcomings in action (which occasionally resulted in the design and installation of improved armour or weapon mounts). The excitement of combat, as a 'reward' for seemingly unnoticed efforts on the ground, highlighted the importance of the ground crews' work and heightened their respect and understanding of the aircrews' tasks. They, in turn, came to regard their ground crew colleagues as more than just simple mechanics. While they were a valuable means of team building, these job swaps were only made on relatively short and simple operations. These exercises were generally successful and some very close friendships evolved.

Other replacements were far less welcome. The occasional appearance of a *Kriegsberichtler* (war correspondent) was deeply resented and commanders often flatly refused to tolerate their presence on operational flights. Aircrew were contemptuous of *Propaganda-Kompanie* reporters for the wildly inaccurate newspaper and radio claims they had to endure, boasting great success for 'minimal losses'. In fairness, much of the reporters' original text was corrupted (for dramatic and political purposes) by propaganda ministry officials who seldom ventured anywhere near an aircraft, let alone the frontline. Göbbels quickly decreed that *PK* men must first undergo appropriate training, as air gunners or even bombardiers, and some took a very active dual role in campaigns from mid-1940 onward. By far the greatest contempt was



Crew chiefs jealously guarded 'their' machines and always valued careful flight crews. With the regular crew on leave, a crew chief might occasionally report an aircraft unserviceable, or even delay repairs, to prevent its reassignment to another less experienced crew. (Gregory Pons)

reserved for the (thankfully rare) accompaniment of a 'Sandsack' (sandbag) – a completely useless staff officer who contributed nothing to the operation, thereby endangering the whole crew, and whose sole intent was to qualify for a year's flight pay and an Iron Cross.

Coping strategies

Any change to normal routine, caused by illness, leave, replacement, injury or death, could have a profound impact upon the cohesive operation of the entire crew. Their effectiveness demanded complete trust and familiarity, and was characterized by subtle practices and signals unique to each crew and developed since their days at *Grosskampffliegerschule*. It was in everyone's interest that replacements settled in quickly, encouraged and aided by their new comrades.

The odds seemed so heavily stacked against survival that airmen invariably developed some degree of superstition. They carried lucky charms or observed certain rituals (similar to the USAAF fear of placing a hat on a bed), but the precise nature of each man's atonement, of course, varied tremendously. Friday 13th had the same significance as for the British and Americans, while other chance events were considered lucky omens. An airman who was presumed killed and his family duly notified, but who later returned to his unit, was apparently assured of survival, for example.

Most 18-year-old flyers brimmed with confidence on their first missions. Gazing across a gently undulating mass of heavily laden bombers, they felt invincible, but the first sight of a falling aircraft was a chilling and mortifying experience. Virgin crews suddenly realized just how vulnerable these machines were and became sharply aware of their own fragility. Fragmentary apparitions were later recalled in vivid detail. Whether swathed in fire, plummeting dumbly to earth trailing thick black smoke, or suddenly bursting into a thousand pieces, the ghastly spectacle stayed with them for life. It is impossible to imagine the distress felt by the young airmen as they witnessed these surreal scenes, but as Stuka pilot Horst Ramstetter observed, 'They came back crying their eyes out.'

No matter how the aircraft had died, gracefully or violently, it was a vision that somehow stood out above the many horrors that most *Kampfflieger* were forced to witness. Numbled by the dreadfully painful loss of close friends, in time men grew to accept the passing of more comrades as inevitable. They knew their own time would come too, they just did not know when, where or how. Eventually, the news of death would be registered without pity. Ju88-gunner Heinz Philip was holding a particularly good hand when a mission interrupted a game of *Skat*. When he returned, he sat and waited for the other three. They had crashed on take-off and burned to death. Undeterred, he said, 'Well, there must be someone around here who can finish this game.' There was, 'so we finished the game'. In the words of General der Kampfflieger Werner Baumbach, it was as if they had 'simply gone on ahead'.

ON CAMPAIGN

Movement of an air unit was a major logistical exercise, requiring meticulous timing and coordination to ensure operational capability in

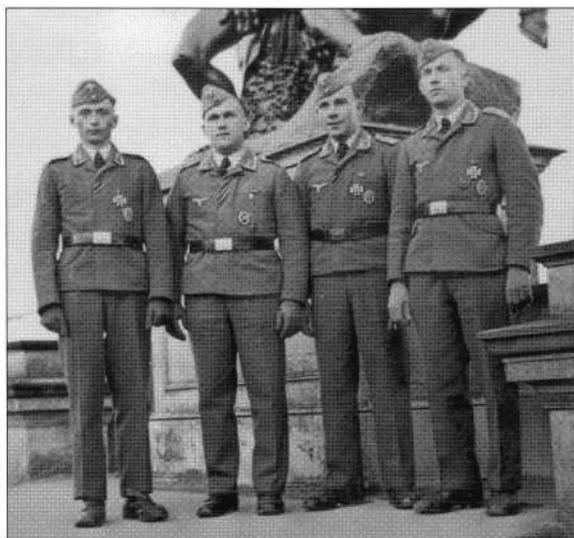
the shortest time possible. Once *Fliegerhorst* (air station) boundaries had been confirmed, a few of the more experienced pilots would immediately scout the surrounding countryside, usually in Fiesler 156 *Storch* liaison craft, locating and mapping suitable emergency landing and aircraft dispersal sites.

Logistics

A *Kampfgeschwader-Fliegerhorst* obviously demanded a great deal of space. Geographical restrictions and the need to deny enemy attackers a prime target generally prevented an entire *Geschwader* (with around 126 aircraft) operating from one field. Despite the additional logistical demands, various *Staffeln* would be located at separate *Frontflugplätze* (frontline airfields), often many miles apart. Advance units of pioneers, maintenance crews, supply, administration and command personnel would be dispatched by road to prepare the infrastructure of each airbase. Wherever possible, existing military and civil airports were simply taken over, and extended to cater for the numerous support and storage facilities vital for operations. As soon as the airstrip was ready to accept traffic, aircraft would begin to arrive, bringing with them the leading mechanics and essential stores that would enable the *Staffel* to function, and even execute missions, prior to the rest of the unit arriving by road.

Each *Staffel* required access to equipment stores, machine shops, parachute drying and packing sheds, and secure but isolated ammunition-, bomb- and fuel-dumps. Several units could share some of these facilities wherever their respective fields were close enough, and any tree-shielded minor roads within the area served as convenient pre-camouflaged bomb-dumps. The initially open airfields naturally had to be secured against sabotage, and so brick walls and fencing would be erected around the entire perimeter, with the addition of regularly spaced machine-gun towers and sometimes pillboxes. Concealed dispersal pens and hard standing also had to be constructed. Overly tall trees surrounding the airstrip (which were extremely hazardous in poor visibility) were felled in the interests of safety, and warning lights fitted to the tops of high buildings. Civilian construction companies were frequently employed to assist Luftwaffe pioneer units in such tasks. One Belgian contractor, employed to extend the runway for II./KG3 at Antwerp=Deurne, also obligingly removed the spire of a church, which was unfortunately in direct line of take-off. Sheep were often allowed to roam the flattened grass airstrips, as a simple lawn-mowing expedient.

In addition to all these demands was the need to accommodate 2,500 men. The owners of nearby houses might be ordered to vacate their homes with only 48 hours' notice, to be replaced by squadron personnel. Where sufficient buildings could not be found, barrack huts had to be hastily constructed by *Luftwaffen-Bau-Battalionen* (construction battalions), again often assisted by locally drafted craftsmen and labour. Any available personnel, including aircrews, were employed in the construction of slit trenches – a chore made instantly worthwhile by the first air raid.



An all-sergeant crew enjoy a brief leave together. Originally a relatively comfortable posting, increased Resistance activity on the Western Front from 1943 prevented servicemen from venturing out alone and contact with locals had to be kept to a minimum. (Radziwil Gogol)

A frontline *Kampfgeschwader* consumed around 1 ½ tons of bread, ½ ton of meat, ⅓ ton of sausage and ½ ton of peas every day. The administrative section, therefore, purchased a great deal of agricultural produce from local farmers at government expense, easing a sizeable part of the logistics train. Daily meals produced at the *Kuchhaus* (cookhouse) were usually of a high standard and the individual airman could often supplement his diet with regional delicacies and merchandise. Unlike some liberating Allied units who later battled their way through mainland Europe, the occupying German soldier always expected to pay for such services and many farmers and restaurateurs did lucrative business with their new (if otherwise unwelcome) customers.

Western Europe

Men based in Western Europe enjoyed a reasonably comfortable and civilized existence, little removed from their home stations, with the local civilian population of some countries often surprisingly well disposed toward their new neighbours. While most resented the occupation of their homeland, many citizens of Belgium and Holland in particular could not help but be impressed by German military achievements and displayed a curious admiration for air crewmen. Although not overtly collaborationist, they occasionally insisted on buying drinks and questioning the airmen about their daring exploits.⁴ The locals, with whom acquaintanceships grew, appreciated respectful behaviour, and many were genuinely saddened when their resident *Geschwader* transferred to another base.

If a short leave period prevented travel home to Germany, the *Kampfflieger* could spend the available time exploring his immediate surroundings. Even with wartime restrictions, public transport systems were such that travel further afield was not impossible. Many indulged in cultural and historic tours around ancient capitals and landmarks, visiting museums and galleries. Enormous numbers of Wehrmacht personnel undertook pilgrimages to the Ossuary of Verdun and the many German and Allied cemeteries tracing the length of the previous Western Front, often to visit the last resting place of a father or uncle.

Those in need of a more relaxing atmosphere could repair to the *Fliegerheim* (flyers' home), established in Paris early 1941. This former baroque palace in the Parc Monceau had been converted by German construction firms, under guidance of the *Sonderhaustab* (special buildings commission), to provide peaceful sanctuary for mentally and physically drained aircrews. Staffed by *Deutsches Rotes Kreuz* (German Red Cross) workers, the hostel was well equipped with a very popular table tennis and games room, a writing room, library and reading room, several lounges and a refectory serving teas, coffee and light meals. The wine cellar was appropriately transformed into the '*Bierstüberl*' (beer lounge). Overlooking the main entrance hall, a giant bronze bust of the Führer was installed at the foot of the marble staircase with its huge ornamental wrought iron banister; this no doubt had its own effect upon the men's flagging morale.

Paris was, of course, also a Mecca for those young airmen seeking a rather more uplifting experience, and the nightclubs of Montmartre and

⁴ It is interesting to note that large numbers of Flemish volunteers later joined the Luftwaffe – the majority (c. 50,000) serving in Flak batteries stationed in Holland.



In a snapshot familiar to their Allied opponents, members of an Africa-based unit make their own entertainment. Many elements of the practical and comfortable *Luftwaffe-Tropenanzug* are visible, including long- and short-sleeve shirts, assault trousers and off-white wool socks. The flysheet over the tent insulates a layer of air, reducing the inside temperature. (John S. Koller)

the Folies Bergère were ever popular destinations. Naturally, the local *femmes de la nuit* were also kept busy. To German servicemen, prostitutes were known either as *Dirnen* (girls), the easily translated *Huren* or more poetically *Bordsteinschwalben* (curbside swallows). The most common term, however, was the rather unpleasant *Nutten* (slits).

Other men were able to establish more meaningful relationships with local girls, but tragically, many of these women were later subjected to vile acts of humiliation and recrimination, meted out by their own countrymen against perceived collaborators. KG26 pilot Horst Juventus was so distressed by the disappearance of his French sweetheart, following threats from the local Resistance, that he requested transfer from operational duties, 'a pilot pining for lost love was no use at all ... I could prove a real danger'. His girlfriend was never seen again.

Although all personnel had already received a full course of immunization during their recruitment and training programmes, the movement of a unit overseas entailed a further round of booster shots for everyone. Contrary to the normal practice of injecting the upper arm, throughout the Wehrmacht vaccinations were administered to the chest: into a man's right breast if he were left-handed, or his left breast if right-handed. Thus any temporary, localized paralysis caused by the more virulent cholera and paratyphoid strains would not seriously impede his daily duties.

Africa

For those stationed in Africa, scorching days, freezing nights and viciously abrasive *Ghibli* sand storms made the western desert one of the harshest environments in which *Kampfflieger* had to serve. Aircraft were not the only things to suffer from the constant ingress of sand. The sharp granules, which always got into any food (and everywhere else), caused cumulative damage to tooth enamel, and dental complaints became commonplace. Combined with a limited fluid intake, the

passing of sand through the digestive system could produce a painful irritation all its own. But the human body is a remarkably adaptable machine, and, in time, subtle physical changes took place. Servicemen noticed a general deceleration in hair growth, reducing the need for frequent shaving and thus conveniently saving water rations. Another (less appealing) biological effect was the passing of a particularly dry stool. On the infrequent occasions that a man needed to evacuate his bowels in the latrine, or take a '*Spatengang*' (spade walk), his intestinal tract had already absorbed much of the moisture from the faeces. There was always a little more to be extracted, however, and within moments the deposit was neatly chopped up and carried away by '*Sheiss-käfer*' (identically known to the British as 'shite beetles'), that seemed to appear from nowhere and disappeared just as smartly.

Personnel serving in North Africa were paid in Italian lire, although the opportunities to spend any of it were somewhat limited. Leave was infrequent and, in the more remote locations, quite pointless. Nevertheless local Arab merchants soon learned to supply as many demands as they could possibly identify, by way of services and bazaar souvenirs. Just like their British opponents, many Germans picked up a few words of Arabic or Swahili during their dealings with traders, and daily conversation among themselves became liberally sprinkled with these phrases.

Contact with women was virtually non-existent, and only likely at major ports and cities. Where they could be found, very few German servicemen would dare employ the indigenous 'working girls' as this was in direct violation of the German Race Acts of September 1935 (designed to protect Aryan blood and German honour), a law aggressively enforced by the *Feldgendarmarie*. Instead, such needs were admirably fulfilled by the only officially sanctioned military brothel in North Africa, at No. 4, Via Tassoni in Tripoli, entirely staffed by Italian women. The use of no other establishment was permitted for enlisted men and NCOs, including those licensed for Italian military use.

The Russian Front

There were many hazards of service in Russia. The infamously bitter winters jammed control surfaces with ice and made tyres brittle. Slick runways caused countless take-off and landing accidents, accounting for as many losses as enemy action. Temperatures dropped to -30°F, causing engine oil, grease and lubricants to freeze solid, and rendering up to 75 per cent of all aircraft inoperative throughout the winter of 1942. Petrol-driven *Kärch* heaters were employed in attempts to pre-warm (or rather, thaw) the engines, cloaked in thermal jackets and fed through 'umbilical' hoses, although the process had to be commenced many hours ahead of start-time. Typically, it was the ground crews who suffered the cold more than most. Working both day and night with intricate electrical, mechanical and engine components, which prohibited the use of gloves and with the constant danger of exposed skin bonding to frozen metal, they incurred high incidence of frostbite and hypothermia.

Units lucky enough to have concrete billets or abandoned factories at their disposal were forced to burn furniture, doors and window frames in the absence of any other solid fuels. The majority of airfields



were bereft of such accommodation, and since tents were completely inadequate, underground quarters had to be constructed. This troglodyte existence did, at least, provide respite from the savage ice winds and afforded some protection from incessant Red Air Force raids. A Russian winter does not last forever, but the spring thaw merely created alternative problems with which to bind a *Kampfgeschwader*. The *Rasputitsa* (time of no roads), as the Russians themselves called it, instantly reduced all unmetalled surfaces and airstrips to a sucking morass. Baking hot and dusty summers brought dangers of their own, with many ground crewmen succumbing to heat stroke. Vast crop fields concealed another altogether unexpected problem. Personnel of KG51, living in tented encampments at Balti in Bessarabia during 1941, spent much of their time battling a plague of mice. Such infestation carried high risks of disease, with droppings left in nibbled food stocks, the undetected gnawing of aircraft components and equipment, and the startling discovery of unwelcome company in personal kit. The heat also had detrimental effects upon food preservation, with the resulting generally poor diet and unsanitary conditions inevitably producing gastroenteritis and dysentery. Autumn was but a short, muddy transition to another bitter winter with frequent heavy downpours that flooded airfields and accommodation. Although bitter, none of the subsequent winters equalled that of 1941–42.

The demands heaped upon the *Kampfgeschwadern* stretched them to, and often beyond, their limits. Crews made three to four sorties per day, each between four and five hours long, and most units remained operational for at least six months (some up to nine months) without a single day off since the start of the campaign. Unsurprisingly, medical officers of several units reported that extreme nervous exhaustion was widespread among aircrews. Relentless long-range flights, constant mortal fear and the physiological stresses of dive-bombing severely

***Ostfront Kampfgeschwadern* suffered regular casualties to Red Air Force harassing raids. The *Polikarpov Po2*-equipped units, including the all-woman '*Nachthexen*' (night witches), sometimes inflicted very heavy damage; in November 1942, one well-placed bomb on a fuel dump at Armavir airfield touched off a chain of explosions, destroying or damaging almost 100 fully laden *He111s* and *Ju88s* from several *Geschwadern*. After a somewhat lighter raid, crews salvage the charred remains of a parachute, probably to be fashioned into scarves, *Fusslappen* (foot cloths) or comfortable, lice-proof underwear.**

degraded bodily and mental constitution. Men became fractious, a typical symptom of sleep deprivation, sometimes breaking into unprovoked weeping spasms. Air and ground crews alike were on the verge of a collective nervous breakdown. Some Geschwaderkommodore were forced to implement timetables that at last made rest periods possible in rotation. Men seized the opportunity to sleep, sometimes for days at a time. Others resolved to get as far away as possible, as quickly as possible. Although rare and fleeting, a little peace had great restorative power upon a man's spirit. Returning mentally refreshed, he nevertheless began to sink back into the general state of nervousness within a few hours.

While leave shortages severely undermined morale, perhaps the most distressing and all-pervading of miseries was the lack of contact with home. Although every effort was made to convey mail to and from Germany, the demands for ammunition, fuel and medical supplies across the 1,000-mile front simply had to take priority. The desperately over-worked *Transportflieger* did all they could to alleviate the situation, shoehorning mail sacks into their Ju52s wherever possible, but untold tons of letters were never delivered. Some units detailed men to undertake epic road journeys, lasting several days, to deliver and collect mail from rear depots themselves. A simple and effective expedient was finally devised in 1943 to establish occasional radio links with Berlin. A bomber flying at high altitude, trailing its 75 yard-long cable aerial, enabled *Luft-Nachrichten* signallers to relay short (often coded) messages between squadron personnel and their families. The meteorological officer of KG51, Doktor Rumbaum, learned of the birth of his daughter in this humorous message: 'New tail-less aircraft type fit for take-off. Production plant ready to accept further work.'

In the remote agricultural regions of Russia, Byelorussia and Ukraine, most villagers (never enamoured of their Soviet overlords) greeted the invading German army as liberators and proffered friendly assistance. A mutually beneficial trading system was established with peasant farmers who sold geese, eggs, pigs and cattle to the *Kampfflieger* to supplement meagre rations. (This was in contrast to Red Army soldiers, who, with little to exchange, simply commandeered supplies.) Acts of fraternization carried enormous risk for the villagers, if discovered by a *Politruk* or military *Kommissar*, yet they frequently courted still greater danger by assisting shot-down Luftwaffe airmen to return to their own lines. The slaughter of these docile villagers, principally by *SS-Einsatzgruppen* under the edicts of Nazi racial policy, soon squandered the potential of these helpful allies and ensured total and brutal defeat for the Third Reich.

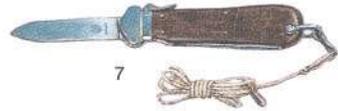
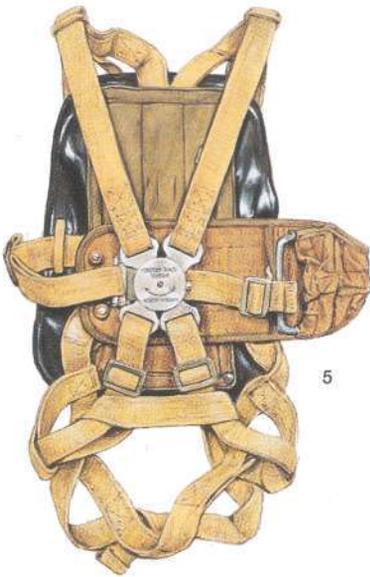
Mediterranean Theatre

The demanding climate, ever diminishing supplies, and the seemingly unending nature of the entire campaign, contrived to make the Mediterranean one of the toughest theatres of the Second World War.



Dining al fresco. A Mediterranean-based *Kampfflieger* made this portrait of his crewmates buying oranges from a local trader, c.1942. The Unteroffizier on the left has applied a particularly sharp bend to the crown stiffening-wire in his *Schirmmütze*, contrasting with that worn by the Oberleutnant. The Uffz gunner on the right wears a fashionably shortened *Fliegerbluse* and carries his camera, as per regulations, on his left hip. He also appears to have pinned or sewn the crown pleat of his *Fliegermütze* together, presenting a slightly lower and sharper profile.

Geschwader Immelmann 3



Training establishments (Fl.Ers.Abt., Fl.Anw.komp. and Fl.A.R.), 1940



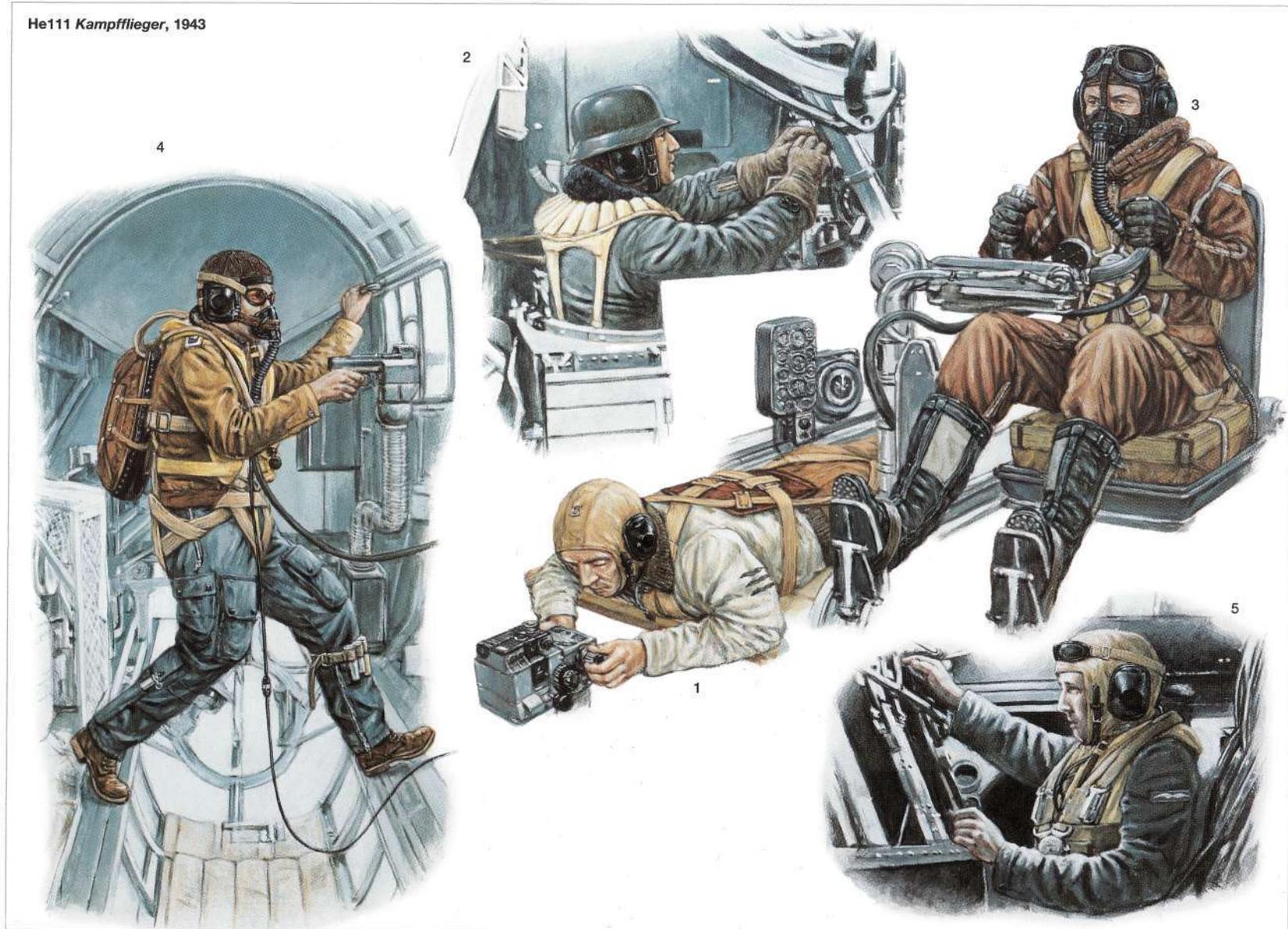
Sturzkampffliegerschule 1, Wertheim-Regensburg, 1941



II./Grosskampffliegerschule 2, Horsching-bei-Linz, Germany, 1942



He111 Kampfflieger, 1943



Stab-III./Kampfgeschwader 2 'Holzhammer', Gilze-Rijen, Holland, 1944





Geschwader General Wever

Geschwader Hindenburg

Geschwader Goelcke

Legion Condor





I./KG30 *Bombenwart* prepares an SC250. The *Geschwader's* own *Platzsicherung* (airfield security) detachment was often augmented by army reserve personnel, such as this *Landsers* with M1916 *Stahlhelm*. Note the extended dive-brake behind the port engine nacelle, the black and white stripes forming part of the *Balkankreuz* insignia when closed. (Gregory Pons)

This aside, the posting had its compensations. The *Kampfflieger* stationed in Italy, Sicily, Salonika or the Greek Isles was almost overwhelmed by the great range of local *'Delikatessen'* that supplemented his diet. Meals regularly featured fresh or sun-dried tomatoes and fish, oranges, mandarins, cheeses, olives and, of course, plenty of pasta. Given the chance, he could enjoy a tremendous selection of wines, too. Steeped in history and culture, the Mediterranean region presented excellent leave potential, and thousands explored the Acropolis, ancient Roman villas and the comparatively modern architectural splendour of Rome.

Until 1943, an ostensibly Fascist Italy imposed none of the restrictions found elsewhere and the *Kampfflieger* was able to consort freely with local women. Alternatively, he could turn to one of countless civil or military bordellos,⁵ such as that hosted by *La Tenutaria del Casino* or *'La Signora'* Luccia Cecotti, at No. 10, Via Ludovico Cavitelli, Cremona. This facility was just one of several founded within range of the Caserna Manfredini, an Italian Army barracks 80 km south-east of Milan. Although the girls at these establishments were regularly checked, as in most armies, contraction of any serious social disease was considered a self-inflicted wound. If it was determined that the soldier had failed to exercise proper precautions, he would be duly charged with such an offence. Several brands of condom, such as *'Odilei'* in *Tropfenfest* (tropical) packaging, were readily available to Wehrmacht personnel.

BATTLE

All operational orders originated at the *Gefechtsstand* (battle headquarters). The *Kartenstelle* (map room), chiefly responsible for updating and issue of appropriate aerial maps, selected the general routes in and out of the target area according to calculated range, as dictated by aircraft type and bomb load.

The *Wetterstelle* (weather office) provided planners with constant reports and forecasts, before and throughout each mission. Meteorological personnel were affectionately known as *Wetterfrösche* (weather frogs; in

⁵ These institutions remained operational until abolished under the Legge-Merlin Act of 1956. 'No.10' is now a restaurant, appropriately named *La Trappola* (the trap).

German folklore, frogs are renowned for their forecasting prowess), or, less kindly, *Falsche prophete*. Under command of the Funk-u. Navigationsoffizier (wireless and navigation officer), the *Bodenleitstelle* (ground control centre) informed aircrews of available radio frequencies and take-off and landing signals. Constant communication would be maintained with the formation throughout the flight, via the *GeschwaderLuft nachrichtenkompanie* (air signals company), advising of any weather updates or last-minute amendments to orders. In turn, they received regular reports from aircraft wireless operators, relaying any critical information back to the *Gefechtsstand*, who could decide the required course of action and issue new orders as necessary. From this basic information, the *Staffelkapitän* fixed the precise approach, bomb-run sequences and exit routes, finally briefing the squadron observers.

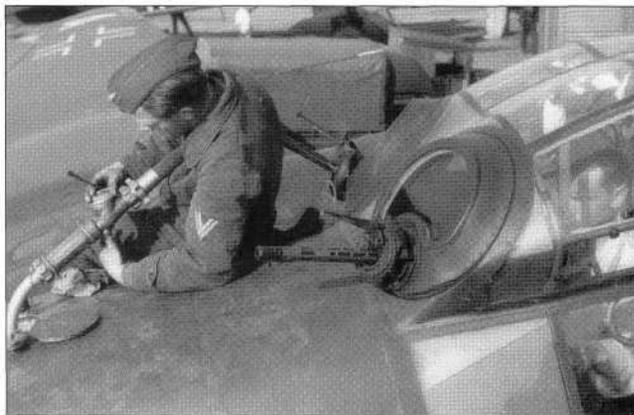
From 1940 a necessarily generous 400 Reichsmark bonus and extra leave privileges were granted to specially selected, sometimes voluntary, *Zerstörerbesatzungen* (destruction crews). Written orders and target descriptions came directly from *Fliegerkorps* headquarters, and although no time was specified, assignments were expected to be completed as soon as possible. The aircraft commander theoretically decided the exact method and time, based on prevailing conditions and crew readiness, but was occasionally detailed to execute a mission immediately, regardless of these factors. The near-suicidal raids against vital installations, principally aircraft factories, engine works and airfields, were flown without fighter escort. Crews were obliged to destroy their targets, in addition to regular operations.

Preparation

Aircrews themselves frequently knew little of the precise nature of their target, sometimes not even the name of the city, and were often not interested. Their only real concerns were to know about the levels and type of defence they might expect to encounter. Only the *Beobachter* (observer) needed to know that much detail, and even he received only the shortest of briefings, with target descriptions often limited to little more than map references. As the *Staffel* grew evermore familiar with their operational areas and routes, information could be reduced to an airfield or factory name only. Before long this was perfectly adequate, as veteran crews could navigate by sight and memory alone.

Beobachter were initially under very strict orders to avoid civilian casualties wherever possible, to the extent of aborting an entire mission if necessary. Enemy reports of deliberate 'terror raids' prompted investigations by *Führerhauptquartier* (Führer Headquarters) itself. The offending aircrews were traced and interrogated to ensure they had exercised all practical precautions.

On 24 August 1940, British jamming of the *Knickebein* radio-navigation signals caused He111s to inadvertently strike blacked-out central London, believing it to be Shorts' aircraft factory.



An Obergefreiter Tankwart (fuel maintenance man) tops up Ju88 reserve tanks, while a Waffenwart checks the B-Stand guns. Aircraft often commenced long-range missions with only a partial fuel load, stopping at forward airfields to fill up, and ensuring maximum possible reach. The various 'Wart' nicknames were derived from *Wartung* (maintenance).



A Motorenschlosser pre-warms the engines. Flugzeugmechaniker regularly attended courses on the latest types and were usually able to attend to any visiting aircraft. 7./KG30 crew chief, Oberfeldwebel Heiner Mank even earned his unit a cash bonus by inventing a special spanner for a particularly inaccessible Ju88 sparkplug. Additional paint layers on this I.Gruppe machine indicate switches to and from night operations. (Gregory Pons)

The Luftwaffe continued to concentrate on military targets, but five seemingly 'unprovoked' RAF raids on Berlin eventually incited retaliation on 7 September, intended to force a return to military targeting. Hereafter, mission briefings could not have been more succinct: London, Bristol, Coventry. Escalating casualties merely ensured a bitter duel, killing 60,000 British and 600,000 German civilians by 1945.

Crews gathered their gear for the long trek to dispersal. Civilian buses had originally been commandeered for this purpose, but ever present fuel shortages curtailed such luxuries and most had to walk (sometimes well over a mile) to the flight line. Ground crews helped airmen into their flight suits, and life-vests and parachute harnesses were adjusted to a tight fit.

These physical preparations did at least provide a brief distraction from impending mental stresses. Most felt a degree of anxiety before every mission, sometimes evolving into great fear, resulting in trembling, clammy sweats or a dizzy, sick feeling. In extreme cases, men found their legs momentarily refused to move or, conversely, turned to jelly. Some attempted to stifle their nerves by singing or humming a favourite tune. He111-Bordschütze Gerhard Adam admits 'OK, I was afraid', but his comrades encouraged him with 'witty and funny remarks' throughout his very first combat sortie, over Leningrad in late 1942. Fear was not confined to inexperienced crewmen, however, and even seasoned veterans could be reduced to vomiting before an operation.

Take-off

The crew ambles reluctantly toward the belly of their machine, perhaps exchanging a few words with the *Erste-Wart*, seeking reassurance that all will be well. Everyone climbs aboard and squeezes awkwardly into his post, as a *Schwarze* ('blackie', a nickname for ground crew mechanics) slams the gondola entry hatch shut. A few minutes later, when everyone is strapped into take-off positions, the pilot enquires over the intercom 'Alles Klar?'



Unteroffiziere airman and Funkwart work together on the cockpit. Some ground crewmen, having watched others depart and (hopefully) return in the machines they spent countless hours maintaining, volunteered as reserve aircrew. Following appropriate instruction, they covered for resting, injured or lost personnel as flight engineers, wireless operators and gunners. (Gregory Pons)

(‘All clear?’). Each crewman responds in turn, and the intercom is switched off.

The crew sits in silence, awaiting the signal from the crew chief standing just ten yards in front of the nose, while he in turn watches for a signal from the *Start- u. Landeaufsichtsoffizier* (take-off and landing look-out officer). The hands of the cockpit clock deliberately count off the final seconds, and the signal is at last given. Suddenly, the airfield erupts into frantic action as ground control staff wave arms and signal flags in all directions. The *Flugzeugführer* shouts from his open window to the crew chief, ‘*Voraus alles klar?*’, and the chief confirms all-clear ahead. Ground control staff and every observer have received a flight plan from the *Gefechtsstand*, detailing take-off sequence and time slots allocated to each aircraft. The pilot calls ‘*Backbord frei!*’ (port free) as he presses the starter, clutch in, and the 1200hp engine whines and splutters until, with a burst of oily grey smoke driven down into the ground, the props catch and accelerate to a shimmering blur – ‘*Steuerbord frei!*’ When both are running, he gives each full throttle in turn to test the generators. Between them, pilot and observer check oil-pressure and temperature, coolant, hydraulic and fuel pressure, fuel and oil level gauges in well-rehearsed sequence. Engines burst into life at intervals around the field, as lead aircraft are already thundering down the airstrip.

The pilot reduces the revs and applies wheel brakes, easing the pressure against the chocks, which are whipped away by ground crewmen. The *Erste-Wart* shouts the traditional ‘*Bremsklötze weg!*’ (chocks away), barely audible amid the din of the entire *Staffel*’s aircraft, and steps to one side. Throttles are eased open and the machine shudders across the field toward the foot of the strip, at night defined by green lamps. This scurry of activity is a welcome distraction to the crews, who are glad to be moving at last.

A flag, or at night a lamp or green flare, signals the start of the take-off run. Brakes on, half-throttle and then three-quarter-throttle is applied as the aircraft strains to be released. The *Beobachter* watches the instrument panel and signalled that all is well. The *Flugzeugführer* releases the brakes and the machine lurches forward. Full-throttle is piled on as they race down the 1,500yd (1,400m) runway at around 140 mph (220 km/h). Judging the precise moment, the pilot winds the trim lever with his left hand, pushing down the tail, and hauling back the control column with his right. The nose and undercarriage begin to lift just as the red lamps, marking the final 600ft of runway, flash by underneath. The barely airborne machine sways through the backwash of preceding aircraft, only seconds ahead, as the pilot retracts the undercarriage in the desperate struggle for aerodynamics. At around 300ft, the giant eventually settles into a steady, laborious climb. Flaps are retracted and, with an unnerving sink and accelerating lurch, the ungainly metal lump suddenly becomes an aeroplane. Propeller blades are trimmed to a deeper pitch and throttles reduced, as the now stable craft enters a graceful and positive climb. At night, perimeter and runway lights are extinguished as the last aircraft leaves the field. Limited facilities available to frontline units often called for ingenuity; at Gerbini, Sicily, 7./KG30 had to illuminate their airstrip with the headlights of strategically parked cars.



For the return journey, the crew notes airfields and emergency landing sites in case of mechanical failure or serious injury. Introduced during 1940, the SC1000 'Hermann' featured an arrester-ring around its nose, preventing the device from burying itself too deeply before detonation, ensuring maximum blast effect above ground level. (Gregory Pons)

In mixed formations, slow-climbing Do17s and He111s took off first; the superior climb-rate of the Ju88 enabled them to catch up easily. The lead aircraft must maintain constant speed and height for the fleet to assemble on him, until finally the lead *Beobachter* sets a course for the target. The fleet briefly continues under navigation lights to establish safe spacing at night, but these would have to be extinguished about four minutes into the flight. Every crewman scours the darkness, nerves chewed by constant risk of collision (a frighteningly easy occurrence even in daylight). The wireless operator double-checks his radio-telegraphy and telephony set, and reports, *'FT Klar'*. The craft is now ready for its part in the mission. A weighty silence descends upon the crew as they climb higher, and further away from their present home – perhaps for good. The formation might stay together for *Grosseinsatz* (massed attack) against a single target, or split at pre-arranged points, toward individual objectives, in small groups or even individually.



Briefings were typically held outdoors, only retreating to cover in poor weather. A group of *Beobachtere* study their route for the coming mission, aided by a *Hauptmann* briefing officer. Generally experienced crewmen themselves, many of these officers suffered from guilt and stress, provoked by sending young men into battle from which they frequently did not return.

Flight and navigation

With aircraft swaying gently in formation, in-flight checks are carried out; the *Beobachter* and *Flugzeugführer* examine their shared instrument arrays, the former operating switches and fuel transfer levers, more conveniently located for him than the pilot. At night, the *Bordfunker* maintains constant communication with immediately flanking aircraft, in order to hold position and report any mechanical or medical emergencies. He also monitors ground direction-finding equipment in concert with the *Beobachter*. The *Bordschützen* meanwhile attend to their weapons and ammunition supplies, firing short test bursts over open land or sea. On larger aircraft, the *Bordmechanik* might also assist with some general duties.

Although they had their intercom system, most crews preferred to communicate with simple gestures and sign language of their own invention. Outward and return flights granted rare opportunities for solitude and there was no need to interrupt a comrade's thoughts with

A hydraulic *Bomben-beladewagen* (bomb-loading trolley) positions an SC500 under the grinning canine features of a Ju87, for a raid on Valletta, Malta, May 1942. Echoing the Battle of Britain, the costly air campaign sufficiently depleted the island's defences for a well-supported invasion to succeed. Hitler's concerns over high casualties, and unwillingness to divert materiel from his Russian campaign, again resulted in cancellation. Thus another vital hub for regional control was ceded to a near-beaten enemy.



regular and mundane navigational data until the enemy frontline grew near. The longer journeys common to the Eastern Front would be passed in idle chat and banter. Imminent home leave was always cause for great excitement, and crews often spent virtually the entire flight discussing how they intended to spend it, the mission itself of secondary concern.

At 7,000ft, air humidity is quickly evaporated into steam by friction-generated wingtip heat, with the condensation trails, or 'contrails', scratching unmistakable tracks across the sky. Greater danger appears at 18,000ft as the temperature drops to around -30°F and moisture freezes against control surfaces, air-intakes and propellers. Fine, needle-like crystals squeeze through tiny cracks in the Plexiglas nose, peppering the skin with a stinging mist. Unchecked, ice will cause engine seizure, so regular inspections are carried out. Climbing through the damp cloud band nearer the sun melts the ice, but this too could be hazardous. Accompanied by loud cracking noises, chunks of solid ice break free to slam into the fuselage, occasionally smashing off the radio mast. At increased altitude, the rarefied air grows even colder and demands pure oxygen, although prolonged dependency on it has a wearying effect, even in healthy young men. At night, all interior lights are extinguished as they near the enemy front, and an almost complete, inky blackness descends upon the aircraft, leaving only the dim glow of luminous instrument dials. Complete radio silence is imposed and the formation spreads out to reduce the likelihood of collision. The tension increases with the knowledge that already-alerted defences await them.

The *Beobachter* had previously noted distinctive geographical features upon his map, providing accurate datum points throughout the flight. Reaching these points on time confirms original wind speed and drift calculations. If not, flight time, airspeed and distance covered are used to determine actual conditions. These new calculations will then be applied to future headings.

Experienced crews welcomed the appearance of searchlights and distant flak as a helpful navigational aid. They could recognize cities from

their searchlight signature alone, and simply circumnavigate dangerous areas. Certain unconcealable landmarks, such as major rivers and power stations, provided excellent reference points. Large and easily defined towns were familiar features and at lower levels, aircraft could simply follow major road and railway lines directly to their targets.

Heavy fog presented great navigational and formation problems, but wing-mounted fog lamps were seldom used as the reflection generally exacerbated the situation. In such poor conditions, enemy counter-measures on the ground could be remarkably successful. On 30 August 1940 'Starfish' decoy fires lit in British fields to simulate blazing cities, deceived a heavy raid against Liverpool into bombing a Welsh hillside. Even if these massive oil-fed infernos could be distinguished as subterfuge, they occasionally masked the intended target with such dense smoke that an accurate strike was impossible, forcing the fleet to abort its primary mission to seek secondary or opportunity targets. In favourable conditions, however, the *Beobachter* was seldom fooled; regular instrument fixes generally enabled him to find his target.

Flak and fighter defences

Approaching known anti-aircraft emplacements, the *Flugzeugführer* throttles back both engines to confound predictor crews' attempts to determine his altitude and course. If the gunners should hear his muted engines, they might assume from the pitch that this machine is beyond range – a common and surprisingly effective ruse. By sporadically desynchronizing his engines, an experienced pilot could even influence the direction of fire, teasing it away from his planned approach route. The bomber might fly on unmolested, but a swaying searchlight could suddenly find and lock onto its prey, flooding the cockpit with blinding white light. Soon other ghostly fingers converge on the bomber, 'handing over' the captive aircraft to neighbouring batteries as it enters the next zone. The *Flakwaltz* begins with

III./KG30 Hauptmann fastens his silk scarf, 1940. At this time, KG30 aircrews sported neckwear in *Gruppe* colours, matching the background shield of their *Geschwader* insignia (white, red and yellow respectively). Although non-regulation, their purpose was threefold: they provided important symbols of unit identity; they offered comfort and protection from chafing; and they were convenient recognition panels in the event of ditching. (Gregory Pons)



Winching an SC1000 (2,205lb) into position, via block-and-tackle anchored to the tail wheel. All available ground crewmen were commandeered for this Herculean task, and aircrews routinely lent a hand. Throughout 1940, German ordnance suffered a 20 per cent failure rate, sometimes due to sabotage by courageous enforced factory workers. (Gregory Pons)

a sudden dive, jerking wildly, before climbing back up to evade the searchlights' grasp. The pilot buys a few moments of dark safety, until an angrily sweeping, silver shaft catches metal once more.

The first AA-tracers, known as *Bügeleisen* (flat irons), lazily arc through the formation and are closely followed by several innocuous-looking puffs of black smoke by day, or sharp flashes by night, usually inaudible over the drone of engines. As the gunners find the range, aircraft are jolted violently and engines falter from the blast waves of AA shell-bursts above and below, sending shards of white-hot steel to clatter against the wings like gravel thrown at a tin shed. The loud metallic bang of a large shell-splinter punching through the fuselage, mindlessly scything through everything in its way, produces a loud, howling noise to add to the general melee and the acrid, sulphurous smell of explosives.

British AA-fire was generally restricted to a precise, narrow band. Royal Artillery gunners rightly prided themselves on their fire discipline and accuracy, only rarely resorting to deeper or scattered barrage in desperation. The bright, fleeting muzzle flashes on the ground gave brief warning of approaching AA-fire, but aircraft in close formation could do little to avoid it. Instead, the crews had to ride the storm with every muscle clenched, often causing violent, uncontrollable trembling deep within the stomach. It was not unknown for men to wet their trousers, particularly during low-level approaches at around 2,000–3,000ft.

At these heights, reaction and firing times of ground or naval defences were significantly reduced, but the bombers' immediate manoeuvring space was also curtailed in the event of fighter attack. An extremely low-level raid was famously executed by Do17s of 9./KG76 against RAF Kenley on 18 August 1940, skimming across the Channel and English fields at altitudes as low as 2 yards. Steeple-chasing over woodland, several picked up leaves and branches as they ripped through the treetops.

As terrifying as artillery fire could be, the fighter attacks somehow invoked far greater fears. The fighter pilot, determined to down the bomber and all its crew, introduced a personal element to the encounter. With German aircrews bunched so closely together, a concentrated burst of fire into the cockpit would be devastating. Prolonged cannon fire hammered through the engines and wing-roots would rupture the main tanks. Gushing fuel, combined with explosive rounds and tracers, could easily take the wing clean off.



1./KG53 Unteroffizier prepares to board He111 'Julius-Heinrich'. The flight suit is worn, as intended, over the inflatable *Schwimmweste* for protection; even a small tear would render the vest completely useless. A short midriff zip was initially incorporated into the flight suits to provide access to the vest's compressed air cylinder. This was soon replaced by a quick-opening '*Reissverschluss*' (rip fastener) to the left side of the suit, permitting access to both the canister and oral inflation tube. (Bundesarchiv #342/620/8)

As enemy territory draws near, every eye is strained for a distant shadow or the slightest movement below. Even at close range it is extremely difficult to define a well-camouflaged profile against the shifting landscape.

The contrails that once betrayed the bomber could now become an ally; a sudden break in the tracks above indicate that fighters have commenced their diving attack and would soon be on the bombers. Many gunners were initially dismayed that their own fighter escort denied them the chance to exercise their skills. The first interloper quickly changed their outlook.

A sudden shout of *'Jagdflieger!'* and everyone is braced for the onslaught. Reactions and aim must be instant and perfect; a fraction of a second would determine survival or disaster for the entire crew. Every gunner has to hold his emotions firmly in check, while he quickly and clearly tells his comrades the direction and level of incoming fighters. A shouted instruction over the intercom becomes an indecipherable hiss – useless noise that might easily result in an airman's death, instead of saving his life. Furthermore, it could induce an air of panic among the crew, instantly destroying all hope of cohesive defence. The sheer number of attackers often made precise direction and fire control impossible.

Aerial engagements were extremely short-lived occurrences. Most of the fighter's time was devoted to selecting and reaching a suitable starting point for his attack, and repeating the process after every pass. Even if a running battle developed over several miles, to the bomber crew it was made up of frantic, terrifying moments. Put simply, it was a brief and uneven confrontation between one man with a single MG-15 (and severely restricted vision), and a rapidly closing opponent with up to eight medium or heavy machine guns. With a cyclic rate of about 850 rounds per minute, sustained fire on the Rheinmetal-Borsig MG-15 ate through a 75-round magazine in just five seconds. Reloading took a similar time. During 1943, MG-81 machine guns, fed by 500-round belts, replaced these woefully inadequate weapons.

For all his training and accuracy, an air gunner seldom got to place well-aimed fire at the fighter as it flashed past him at around 375 mph. He could merely throw a wild burst in its general direction, before the blurred apparition vanished completely from view once more. The crowded scene of insanely twisting silhouettes could melt into a deceptively peaceful, clear blue sky in an instant. Bombers commonly came under sustained attack, with cockpit and radio sets blasted to pieces by sparking bullets, and yet the entire crew saw nothing of the fighters tumbling all around them.



All manner of domestic and wildlife species were adopted as unit mascots and individual pets. KG26 'Löwen-Geschwader' naturally recruited lion cubs, but pets included anything from crows to eagles, chameleons, goats, donkeys and even camels. Dogs were the favourite and many crews adopted their own 'Bordhund', some of whom logged several (non-operational) flying hours. (Gregory Pons)

'Bremsklötze weg!' for another night raid on England, August 1941. Initially appalled by orders to attack civilian districts, crews gradually accepted this as retribution for Bomber Command's area bombing policy. The under-surfaces and external bomb-load of this He111 are liberally coated with non-reflective black paint against searchlight detection, which was effective even at close quarters. (Hayley Morris)



Take-off and landing the temperamental Ju88 was often considered among the most terrifying aspects of a flight. The large rudder held the tail perfectly straight until it lifted, whereupon it could make violent swings for no apparent reason. Unless the pilot reacted quickly and correctly, he might easily lose control. Painfully clenched abdominal and rectal muscles drained many pilots even before the mission began in earnest. (Gregory Pons)



At greater range a gunner has a little more time to aim, but the danger of firing into other bombers in formation could deny him even this fleeting chance. A fired round does not stop when it misses the intended target, of course, and with effective ranges of up to a mile it is inevitable that a degree of damage was caused to friendly aircraft by stray 7.92 and 20mm cannon-fire.

Bomb-run and observation

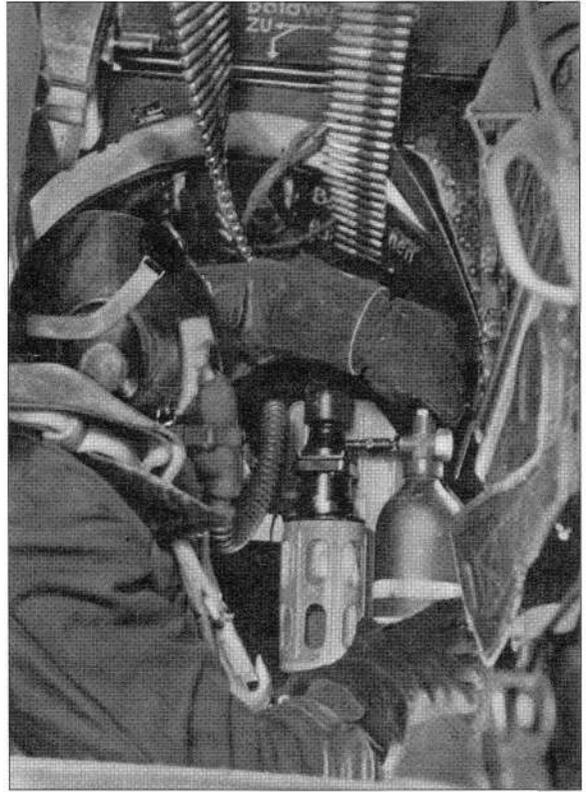
As the formation reaches its target area almost exactly on schedule, the fighters finally break off their assault as the first grey puffs of light flak appear. The leader waggles his wingtips, signalling the formation to loosen as they begin to climb. Moments later a green flare is fired and aircraft break in all directions to prepare their individual attacks. Each circles patiently, avoiding flak concentrations, while the *Beobachter* selects a suitable start-point for his bomb-run. Keeping a close eye on the clock, he observes and records the results of the preceding aircraft's strike.

Each aircraft has been allocated a precise time over the target, a one-minute slot in which to deliver its payload. (Allied bombers routinely held formation to release cargoes simultaneously on cue from the leader, plastering much of the surrounding area.)

Oblivious to the chaos around him, the *Beobachter* remains transfixed over his *Lotfernrohr-Bombenzielgerät* (perpendicular telescopic bomb-sight), concentrating solely on coaxing the approaching target directly into his cross hairs. Ground wind direction, which might push the bombs slightly off course, could readily be determined from chimney smoke, or even horses and cattle, which habitually stand with their hindquarters to the wind. The pilot's concentration, meanwhile, flicks between instrument panels, busy traffic and his commander's voice. Fighting all natural instincts to heave the machine away from pounding artillery, he must hold a steady course, listening intently for every subtle correction relayed to him. A Ju88 pilot could occasionally get to settle the score with his observer: in dive-bombing attacks he became bombardier, aiming the aircraft directly through a *Reflexionsvisier* (reflector-sight). The observer then had to sit patiently beside him, checking their 60–70° angle against coloured lines etched on the port window.

With no duties to distract them, the remaining crewmen are only too aware of the countless dangers surrounding them, expecting a direct hit at any moment but not knowing exactly where it would come from. Every man wills the *Beobachter* to release his *eier* (eggs), cursing him silently for his precision, but knowing that this was the moment he trained for. His pride and reputation are at stake. Moreover, he has no desire to sell his life, and those of his comrades, cheaply. If they are to die (and their circumstances seem to dictate that they should), then he must ensure their efforts are not in vain. Close would simply not do.

After an eternity, the *Beobachter* finally hisses a self-assured 'Jetzt!' (now) as he presses the release switch. The aircraft suddenly lurches upward with the instantaneous loss of up to 1 ton of steel and high explosive. If a serial is being unloaded, a rapid succession of faltering lifts is felt, as the release-interval mechanism drops each projectile in 30ft (10m) increments. When the *Bordmechanik*, lying prone in his ventral turret, confirms all bombs gone, the pilot immediately slams open his throttles, side-slipping clear of the target for the following crew. From 6,000ft, the bombs take about 20 seconds to hit the ground, but they disappear from view long before. The *Beobachter* could perhaps squeeze a glimpse at the results of his work, although the *Flugzeugführer* seldom got the chance. Standing orders forbade him from making additional passes, but very few wanted to. The *Bordmechanik* in a medium-bomber, or the *Bordfunker* in a Ju87, had the best views of a strike.



A *Bordfunker* checks oxygen supplies. Any system failure would result in anoxia, a serious deficiency of oxygen in the bloodstream. A punctured or ice-blocked oxygen mask hose could cause a man to pass out without even realizing anything was wrong. Immediate action was to descend below 10,000ft, perhaps returning to base for medical attention. Luftwaffe aircraft used an advanced 'demand' system, supplying oxygen only upon inhalation. Early British and US aircraft used wasteful continuous-flow systems, which required huge reserves.

Paper-wrapped sandwiches were frequently carried for outward journeys, while boxed energy-rich *Bordverpflegung-Verteilte* (in-flight rations) were generally distributed during return flights. These contained dark or light chocolate, dried fruits, nuts, raisins, and fast-acting *Dextroenergen* tablets for extra long journeys. At high altitude, air pressure could drop to half or even two-thirds of that at sea-level, while internal body pressure remained constant, occasionally producing biliousness and some quite spectacular flatulence.



Watching the silent grey splashes far below, it was possible to separate oneself from the horrors unfolding at the point of impact. Even at lower altitudes, men saw flashes, followed by giant hazy rings racing out toward the horizon, crumpling model buildings, flying matchsticks and blazing toy trucks. On occasion, a steel helmet hovering beside the cockpit, a chunk of masonry slamming against the fuselage, or even a torn limb striking the glazed nose, would jar the occupants sharply back into reality.

Heading home

With enemy defences now fully alert, the return journey was often more hazardous than the approach. A sinister black void in the night sky was a chilling discovery, revealing a lurking barrage balloon silhouetted against the stars. One misty evening in 1940, a crippled Do17 with one engine dead and the elevator jammed was limping home across England when a maze of balloon cables suddenly emerged from the gloom. With limited power and control, the pilot had no choice but to fly right through the steel labyrinth. Barely managing to heave the Dornier past the entanglements, and losing altitude all the while, they finally emerged just six feet off the ground. Gunning that misfiring engine again, he was barely able to reach France for an emergency landing. In another more bizarre incident, Major Hajo Herrmann's Ju88 stalled and lurched to a halt right on top of a barrage balloon, only to tumble off one side into an inverted but recoverable dive.

The use of searchlights, unaccompanied by gunfire, was often the first clue that the bomber was being set up for one of the most dreaded weapons in the British arsenal – the night-fighter. Ironically, the commencement of flak would be a great relief, but the crews' worst fears are confirmed by the sudden appearance of '*Leichenfinger*' (corpses' fingers), bright pink tracer rounds sliding eerily past the windows in

first clue that the bomber was being set up for one of the most dreaded weapons in the British arsenal – the night-fighter. Ironically, the commencement of flak would be a great relief, but the crews' worst fears are confirmed by the sudden appearance of *'Leichenfinger'* (corpses' fingers), bright pink tracer rounds sliding eerily past the windows in silence, or cracking noisily through the fuselage. Bundles of *Düppel* tin-foil strips are hurriedly ejected (akin to British 'window' or American 'chaff', named after the Danish town from where pieces were first recovered) in an effort to confuse the enemy's onboard radar. The bomber's principal defences, however, are its diving speed and a sharp-eyed crew, sighting the lurking silhouette first. Spotting a day-fighter was hard enough, but crews almost never saw a night-fighter. Many literally never knew what hit them.

Damage

Whatever the cause, the physical demise of an aircraft took many forms. A bomber may glide silently past, to be suddenly blown to bits in an oily black cloud. Alternatively it may simply break up, with large pieces dropping away. Other aircraft flying directly through the trail of debris could be damaged or destroyed by impact with falling engines, fins and stabilizers. Sometimes a seemingly unharmed machine sails close by, perhaps with dead or dying crewmen aboard, as a lethargic figure emerges through the upper escape hatch. Leaden and struggling, he drops away to plunge earthward, and moments later a parachute blossoms. Crews could only stare in shock as the descending man drifts into the path of oncoming aircraft, but the *Flugzeugführer* can do nothing to avoid him, for fear of colliding with others in the tight formation. Others were simply unable to escape. An apparently slow and graceful roll to earth actually generates a centrifuge of around 3G inside the fuselage, tripling body weight and pressing the doomed crewmen into the walls of their machine.

Nearby aircraft suffering engine fires have to be avoided because of the danger of explosion. Crews watch helplessly as burning craft lag further behind, but relief that it was not themselves perhaps tempers their sorrow. With so many immediate dangers to distract them there is little time to dwell on the fate of others. Despite their high state of anxiety, those aboard a stricken craft have to act quickly to shut down the crippled engine. The *Beobachter* instantly engages the electrical fuel transfer system, drawing fuel from the dead engine to reserve tanks. An emergency manual pump is provided in case of electrical failure, usually operated by the *Bordfunke*. Although the fire is extinguished, the *Flugzeugführer* must still 'feather' the propeller, rotating the blades into the wind to prevent them turning. Failure to do so would allow them to spin at unregulated speed, which would generate excessive heat within the engine and re-ignite fuel vapour. The machine begins to list, but the pilot pushes the 'live' wing down to compensate. In this attitude, the



In flight, the *Bordmechanik's* technical skills were largely negated and his primary function became that of gunner. If mechanical failure forced an emergency landing, he could attempt to rectify the problem. An He111 flight engineer gets 'comfortable' in his rearward-facing C-stand position, known as the 'Topf' (pot) or 'Sterbebett' (deathbed), here with single MG-15 in the *Bodenlafette* (on-board mounting) or 'Bola'. (Manfred Klein)



Nocturnal operations further aggravating an already complex task, the *Beobachter* uses a standard-issue torch to illuminate his map and Dreieckrechner DR3 (triangular computer) while calculating new bearings. An unguarded flash of white light in the cockpit would disrupt the crews' night vision for several minutes, but a sliding red filter on the torch averted this hazard. Used with yellow-backed maps, the red light provided far sharper image definition than with white-backed versions.

With formations routinely broken up, the return route was seldom the one intended, and crews often had to determine their own way home. In cases of severe damage, or with wounded crewmen aboard, the pilot levels off at 3,000ft (1,000m), while the *Beobachter* locates the nearest emergency landing strip or any suitable open ground. Such unscheduled approaches, especially at night, often confused German air warning personnel, and Flak emplacements frequently opened fire on already battered Luftwaffe aircraft. When pre-arranged flare signals failed to convince the hapless Flak crews, they could incur the wrath of air gunners, who gave spirited return fire in the genuine hope of hitting some of them. One KG55 He111 was brought down, and its pilot killed, as they neared the French coast on the way to Liverpool. In the gunners' defence, they were faced with Allied air forces bombing around the clock, so had to assume that all unseen aircraft were hostile.

Landing

Airstrip lights are illuminated as the first returning aircraft are identified. Priority is automatically granted to crews discharging two red flares, signalling the need to make an emergency landing. Those with wounded aboard pull to one side of the airstrip immediately after landing, and await the removal of casualties by ambulance before taxiing back to revetments. A severely wounded or dead pilot forces the remaining crewmen to make a '*Schwarze-Landung*' (black landing, i.e. without permission, or by an unqualified airman). With luck, the involuntary pilot is flying a He111, which always gave a positive landing. Its weight makes it difficult to bounce, although braking requires substantial effort. Compared to the Heinkel's stately 95 mph landing speed, the Ju88 had to race in at 155 mph to remain under control and was not easy to land at the best of times. It was difficult to get the tail down and had an unnerving tendency to swing violently if even slightly too much brake was applied by an inexperienced or tired pilot.

A lost engine would slow the electrical lowering of the undercarriage, while damaged hydraulics could prevent it altogether. Assuming the assembly itself is still intact, the gear can be lowered manually by hand-wheel or pump. If this back-up system is inoperable, the pilot must execute a '*Bauchlandung*' (belly landing), a procedure that, for obvious reasons, could not be practised, but has to be learned the hard way.⁶ Although theoretically identical to a normal landing, control was drastically undermined from the moment of impact. Friction, sparks and bursting fuel tanks often resulted in fire. Exhaustion, misjudgement and poor visibility caused numerous mid-air and runway collisions, as aircraft attempted to land simultaneously. An unexpected torrent of cannon-fire from the blackness, ripping into an aircraft just as it began

⁶ If a belly landing was found to have been avoidable, the pilot could be charged with negligent damage or destruction of Reich property and sentenced to one week in jail.



Ju88 A-Stand in action. Developed in 1936 by Rohm & Haas, Dermstadt, Polymethylmethacrylate (thankfully registered as 'Plexiglas'), used for nose glazing was (and still is) less than half the weight of glass, but 17 times stronger. The yellow cloth ditching cap, worn over the flight helmet, was intended to aid air-sea rescue searches. In practice, for a *Seenot* crew to spot such a diminutive patch of colour, they would probably have to be moored alongside the unfortunate airman. Downed aircrews were surprisingly difficult to locate and even bright yellow dinghies, with a full complement of waving crewmen, could be over-flown without being seen.

its landing, at last reveals the insidious presence of night-fighters that had trailed the formation all the way back home. Struck at their most vulnerable time, the crews stood virtually no chance of survival. Having made it through countless preceding dangers, the loss of crewmen in these final moments of the mission was particularly cruel.

As soon as the last aircraft is down, all airfield lights are extinguished. Traffic controllers guide each to its *Splitterbüchse* (splinter box) protective pen with green hand lanterns, as ground crewmen set about their tasks. Engines are shut down and silence eventually returns. Airmen struggle to dismount, but the mission is not yet complete: with stiffened joints, crews amble toward the debriefing hut.

Evasion and capture

During the early Blitzkrieg campaigns over Poland and mainland Europe, shot-down crews made determined efforts to return to their units wherever possible, but those who did fall into enemy hands spent only a matter of days or weeks in captivity before liberation. For those brought down over Britain the prospects for escape to Germany were virtually non-existent, although a loose airman could still be a thorn in the enemy's side, tying up disproportionate resources in the hunt. The longest such evasion was made by Feldwebel Josef Markl, 8./KG55 'Greif', in July 1940, only ending when he gave himself up, famished and exhausted after hiding in fields outside Newbury for eight days. While evasion is the accepted duty of the downed airman, very few even attempted to avoid capture, but instead made immediately for the nearest village to hand themselves in. Some were cocky, or mildly irritated by this temporary interruption to their flying careers, certain of liberation by the conquering German Army, but the overwhelming majority were subdued and cooperative, offering little or no resistance. Invariably in shock, they surrendered easily to unarmed policemen or



Do17 Bordschützen observe a distant target. Defence largely depended upon evasive manoeuvres, principally comprising sudden accelerating dives and erratic banking to confound enemy aim. The most effective technique was to fly as fast as possible at extreme low level, where fighters suffered lower performance and severely limited attack options. This also freed the flight engineer from his C-Stand, to cover or reload other guns.

even civilians (although in one case, near Portsmouth, a child's toy pistol was brandished by the local pub landlord). Having miraculously survived a high-speed air-crash, the prospect of incarceration was of little concern. While some took a few punches and kicks, most Luftwaffe airmen received reasonable treatment from their captors – and usually a cup of tea. Their own treatment of British prisoners was sometimes even more hospitable. In 1941 the crew of one shot-down RAF Blenheim were first plied with coffee and beer in a KG26 mess, shown around the base and eventually wound up in the cockpit of a Ju88. Encounters with Americans were not always so genial, however. *Flugzeugmechanik* Karl-Heinz Mewes was deeply hurt when one POW camp guard ripped the Iron Cross from his tunic, feeling the GI had no right to it.

A forced landing on the Eastern Front could be an extremely hazardous affair, and finding sanctuary with any Axis unit was the overriding priority. Many Red Army soldiers, brutalized by years of savage conflict and the bestial behaviour of certain Waffen-SS units, had little sympathy for the unfortunate '*Fashisti*'. Some of those captured by Soviet personnel would not survive long enough to reach imprisonment, and even those that did faced an uncertain future. Such was their fear that several bomber pilots were compelled to land alongside crashed aircraft, risking death or capture themselves in order to rescue their comrades from advancing infantry. Others less fortunate were forced to undertake epic journeys on foot, private odysseys lasting many days or even months, back toward German lines. Reliant on their wits or assisted by courageous anti-communist locals, downed crewmen first had to pass through Russian frontline positions. Rescuing army units promptly lavished medical treatment, food, alcohol and adulation upon any dazed airmen before returning them to their squadron.

Tales of daring escape attempts often overshadow the mundane and distressing reality of prolonged incarceration, but during their years as POWs, the calm and rational characteristics that ensured selection as



Safely home, albeit with different transport, three KG1 crewmen relate their adventures to comrades, September 1939. Their He111 brought down by Polish defences, they battled their way back to German lines with salvaged MG-15s and ammunition. The injured crewman wears a *Schlupfjacke* sweater, with a flare pistol stuffed into his belt. He and his Feldwebel pilot and observer, displaying an interesting array of emotions, will presently undergo a full debriefing.



KG30 crewmen celebrate their 100th *Frontflug* (operational or combat sortie). American aircrews famously had the option to return to the USA after 25 missions, imparting their experiences to trainee aircrews (although this threshold was gradually raised). Luftwaffe men enjoyed no such choice. In the words of General Adolf Galland, 'our pilots and crews fought until they died'. (Gregory Pons)

bomber crewmen in the first place almost certainly influenced their behaviour in captivity. Those airmen who were most keen to escape, and persistently uncooperative, were nearly always the fighter pilots.

Casualties

People, like aircraft, can sustain remarkable levels of damage while remaining operable. However, minor injury to a vital component can be fatal. High-velocity cannon shells and white-hot shell fragments produce savage wounds. A machine-gun bullet entry hole may appear clean, but its accompanying shockwave ruptures internal organs and produces massive internal haemorrhaging; the exit wound may be the size of a fist. At reduced speeds the projectile may ricochet off a shoulder blade, sending splinters and debris in all directions as it tears through the thorax, perhaps exiting near the hip. Medical treatment in flight was somewhat restricted by space (particularly in the Ju88), although the crew was well equipped

(see Plate C). In the main, all sides displayed great compassion in the gentle care of enemy wounded. Red Army doctors often expended scarce supplies on badly injured Luftwaffe men. Britons who rushed toward a freshly downed aircraft, intent on “avin’ that bastard!” would, upon ripping open the canopy, be suddenly overcome with shame and concern for the torn and bloody young man lying before them.

Death could sometimes come from unexpected quarters. With aircraft in the hands of the autopilot, the monotonous drone of the engines could have a soporific effect upon the crew, and several *Kampfflieger* confessed to having succumbed to tiredness. Sometimes the entire crew would be fast asleep for several miles, bypassing their last available airstrip or heading out across an ocean. It is impossible to know just how many (if any) crews met their end in this way, flying into mountains and hillsides or simply running out of fuel, but it is not inconceivable. KG30 Beobachter Uffz. Hans Fecht and his crew narrowly avoided just such a disaster over the North Sea in 1941. On occasion, the circumstances were shameful. On 15 September 1940, an already badly wounded O/Lt Robert Zehbe, KG76, came down near the Oval cricket ground in London. An angry civilian mob descended upon him, beating him mercilessly before the police could rescue him. He later died of his injuries.

Throughout the war, German and British air forces upheld the traditions of according full honours to each other’s dead whenever possible. Onlookers gathered in respectful silence, as honour guards presented volley-fire over the flag-draped casket. Where an original could not be found, copies of the *Kriegsfahne* or the ‘Union Jack’ were specially produced. Russian citizens gave simpler, though equally respectful burials to those lost in the East. Many Luftwaffe *Kampfflieger* still lie in British and Commonwealth military cemeteries, not separately, but shoulder to shoulder with their former adversaries.

7./KG30 ground and aircrew assess recent damage to 'Dora-Richard', early 1940. Her name is derived from the Stammkenzeichen (roll number) 4D+DR painted on her fuselage. 'Dora' was one of seven KG30 machines brought down en route to airfields in Yorkshire on 15 August 1940. Pilot O/Lt Werner Bachmann, observer Uffz Werner Evers and flight engineer Flg Robert Walther all entered captivity, but wireless operator Fw Georg Henneske was tragically killed in the action, struck in the head by machine-gun fire. (Gregory Pons)



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COLOUR PLATE COMMENTARY

A: UNTEROFFIZIER (BORDFUNKER) II./STURZKAMPFGESCHWADER 77, NEUDORF-OPPELN, SILESIA, SEPTEMBER 1939

A 1.Staffel wireless operator prepares for his first operational flight. From May 1937 special outer thigh pockets were added to the K/So 34 *Kombination*, for two *Verbandpacke* first aid packets (6) and the gravity-activated *Flieger-Kappmesser* aircrew knife (7), enabling entangled airmen to cut themselves free of parachute lines. The chest pocket could hold maps and target photographs (8), but was often used to stow the oxygen mask. Inset detail shows *Luftwaffe-Bekleidungs Amt* (clothing administration) acceptance stamp and typical makers' label inside the suit (9). Most units added their own identification marks, here denoting 3.Staffel, (I.Gruppe) StG1, but this practice quickly fell from use. The *Armbandkompass* 39 (10) proved difficult to see at night, prompting the introduction of the more visible white-dial version. Of interest is the commercially produced leather 'holster' for pencil and notepad (11), the lower edges of which are secured by a few stitches. Designed to ease fitting over bulky flight clothing, the twin-zipped *Fliegerpelzstiefel* (12) were expensive to manufacture and subsequent boots used a perfectly adequate single zip. A standard belt supports a P-08 Luger pistol but, with no practical alternative, the flare-pistol and cartridges are secured wherever convenient; an unsatisfactory situation that was not rectified until early 1941.

Details of items 1-5 appear throughout the main text.

B: TRAINING ESTABLISHMENTS (FL.ERS.ABT., FL.ANW.KOMP. AND FL.A.R.), 1940

1: Flieger-Ersatzabteilung XI, Neumünster

The centuries-old assault course is used to build stamina, physical strength and team spirit. Recruits wear standard *Sportbekleidung* sports kit, consisting of a cream *Sporthemd* (sport shirt), with two sizes of insignia, and blue cotton *Sport hose* (sport trunks) with elasticized waistband. The black collar stripe denotes an NCO. Issue grey wool *Socken* with white size indication bands are worn with brown or grey *Laufschuhe* plimsolls.

2: Flug-Anwärterkompanie, Berlin-Gatow

Silver braid shoulder strap loops mark this potential pilot as an *Unteroffizier-Anwärter* (NCO candidate). After at least three months' basic training, prospective NCOs attended a

two-month infantry section commanders' course at *Unteroffizierschule*, developing confidence and leadership skills. The black-painted metal *Navigations-Lehr- und Übungsgerät* (instruction and training set) contains flight computer, set squares, slide rule, range protractor and 'wipe-off' calculating tablet with bone scriber.

3: Fliegeruntersuchungsstelle, Mauberge, France

The aircrew examination centre puts would-be air-crewmen through a rigorous *Fliegertauglichkeitsprüfung* (aircrew fitness test). The integral parachute course is here made as awkward as possible with a *KW s/34 Kalbin* (calfskin) winter flying suit and *FK-34* summer helmet. The instructor wears the *Heer-Fallschirmschützenabzeichen* (army parachutists' badge), signifying qualification before 1 January 1939 when the fledgling *Fallschirmjäger* battalion transferred to the Luftwaffe. In addition to physical, sight, hearing and health checks, candidates had to demonstrate responsibility, quick responses and aptitude in maths and geometry. If successful, the *Oberarzt* (medical officer) issues a *Wehrfliegertauglichkeit* (military flyers' fitness) certificate, to be carried in the *Soldbuch*.

4: Flieger-Ausbildungsregiment 32, Uetersen

The Dreyse MG-13 was typically the first machine gun that an airman used. Fl.Ers.Abt. familiarized him with MG, rifle and pistol, but the Fl.A.R concentrated on honing marksmanship skills against static and ground-towed targets. The *Drilllichanzug* work uniform was standard training wear. This instructor wears an early-style *Fliegerbluse*, with arm-of-service *Kragenlitze* (collar piping) and no breast eagle. Until October 1940, this tunic was considered work wear and is thus fitted with *Ärmelstreifen* sleeve bands, denoting *Stabsfeldwebel*.

5: Flieger-Ausbildungsregiment 71, Sorau

Ditching practice was carried out on convenient boating lakes or specially chartered swimming baths. Organized as a competition, trainees had to board a four-man *Schlauchboot* (dinghy) from the water and row back to shore. A decrease in body core temperature of 4°F can promote hypothermia, a condition worsened by shock (commonly induced by wounds, distress and exhaustion). A 14°F drop brings coma and death. Crews ditching in the North Atlantic had up to three minutes to avoid this fate. Inset: *Erkennungsmarke* (identity disc) for a member of



The Ju88's legendary resilience is evidenced by this example's battered gondola and propellers, the result of skimming a little too low across water. Struck at speed, water is like concrete, but the 'Schwarz'-type laminated wooden propellers splintered upon impact, otherwise retaining their integrity. In a comparable incident, metal blades deform, causing violent, eccentric revolutions. Unless immediately shut down, the engine would quickly tear itself apart.

reserved for flights over vast Russian forest and marshland (20). Each man's *Verbandpacke*, often in waterproof packets, were for his wounds only (21). Every aircraft

2. Rekrut Kompanie, Flieger-Ausbildungsregiment 51, at Weimar-Nohra. Upon the wearer's death, the steel or zinc-alloy disc was snapped along its lateral perforations. The upper half remained with the body and the lower part was returned to headquarters for records and accounting. Many air crewmen retained F.I.A.R.-marked discs throughout operational service. Leather and impregnated cloth covers could be purchased, providing safe carriage for leave passes, photographs, etc.

carried a portable *Sanitätstasche für Flugzeuge* (aircraft medical case) for more serious injuries. The oilcloth pouch contained bandages, burn dressings and wire frame splints for broken limbs (22). Large *Sanitätspacke* (medical packs) were available for long-range flights. Impractical for in-flight use, they provided downed aircrews with comprehensive supplies for prolonged periods of isolation (23).

Details of item 1 appear on page 21.

C: SURVIVAL EQUIPMENT

Some early accounts remark upon serious deficiencies in survival packs. These very rare failures are best attributed to shortages or haste, rather than any lack of concern. If the air cylinder failed, dinghies had to be inflated manually; *Blasebalg* bellows (2) were held against the chest and pumped by hand, an unwelcome chore that took around three-quarters of an hour to complete. Three-piece aluminium *Bootsriemen* (oars) (3) were stowed inside the dinghy. Recognition aids included *Blendspiegel* heliographic mirrors (4) and *Farbbeutel* ('colour bags') of lime-green granules that spread quickly across water (5). Telescopic *Sichtfahne* signal flags (6) were carried in a special lower right leg pocket of the two-piece flight suits. Pyrotechnics included hand-held, orange and red *Rauchsichtziechen* smoke dischargers (7), and assorted 27mm flare cartridges (marked with expiry dates) for the lightweight *Leuchtpistole* (8). Much equipment was produced in occupied countries, as evidenced by this *Schwimmweste* label (9). *Absprungverpflegung* (bale-out) ration tins (10) contained caffeine-laden *Scho-Ka-Kola* chocolate in standard or 'Seenotpackung' (sea survival) packaging (11) and 125g tubes of processed cheese with tinned *Zweiback* 'twice-baked' biscuits (12 and 13). Thermal flasks with a phenol-plastic cup contained coffee or soup for in-flight consumption (14). Two large drinking water canteens were carried, plus a similar *Benzin* petrol flask (15). *Model 9 'Esbit-Kocher'*, (folding field cooker produced by the Esbit firm) with chemical fuel tablets (16 and 17) and issue combination spoon-fork (18) were also useful. The original *Flieger-Kappmesser* (flyers' covered/hooded knife) was susceptible to dirt, but a field-strippable version adopted in c.1940 enabled proper cleaning (19). A *Machete* with blackened steel scabbard and web frog was primarily

D: STURZKAMPFFLIEGERSCHULE 1, WERTHEIM-REGENSBURG, 1941

The Ju87 could absorb punishing stress levels and demanded the same of its crew. The rearward-facing *Bordfunker* must have absolute faith in his pilot during this most disconcerting manoeuvre (much like taking a rollercoaster ride backwards). Practice dives were made with *Zement-bomben* (cement bombs) or 'Zebo', representing an SC250, as inset:

1: Typical approach commences from 15,000ft. As target is acquired through the floor window, the range-timing clock is set. Engine is reduced to idling speed, air-intakes are closed and dive-brakes opened. Nose drops into instantaneous 80° dive and the timing clock is started.

2: A Ju87 tended to oscillate in the dive, but the pilot centres the target in the 'Revi-16B' reflector sight, holding it in the crosshairs. A buzzer sounds at 7,000ft (c.30 seconds into dive), and the pilot starts the release and recovery timer.

3: The aircraft continues to plummet at c.350 mph, largely driven by gravity. At 3,000ft, the *Einhängung* cradle unlocks to swing the bomb away from the fuselage and clear of the propeller. The bomb slips free as the auto-recovery system commences simultaneously. The crewmen push their heads back against padded restraints to prevent their chins being forced painfully into their chests.

4: Auto-recovery pulls the aircraft out of the dive so steeply that crewmembers usually black out under forces of 3-4G. The bomb continues its line of descent toward the target (approximately 15 seconds to impact). Pilot resumes consciousness and control of aircraft.

These trainee crews discuss anti-tank techniques with their

Hauptmann instructor, (who is sporting a privately purchased jacket and suede-reinforced *Reithose*, riding breeches). After 'Stukaschule', crews will advance to a *Sturzkampfgeschwader Ergänzungsstaffel* for operational training.

E: II./GROSSKAMPFFLIEGERSCHULE 2, HÖRSCHING-BEI-LINZ, GERMANY, 1942

Newly qualified airmen were divided into *Kompanien*, assembled into four- to five-man crews and thereby introduced to the men with whom they would theoretically remain throughout their service lives. Three months of intensive training ensued, during which crews gained around 40–60 hours of flight time together, involving formation work, long-distance navigation exercises (to airfields hundreds of miles away) and short-range bombing practice over countryside ranges. Their instructors, often recuperating combat veterans, tutored them in various attacks and current enemy defences. Crews routinely supplemented official cross-training in their limited spare time, with pilots giving rudimentary flight instruction to any interested crewmen.

The addition of silver piping to his other ranks' cap and tunic distinguish the *Beobachter* as an *Oberfähnrich* (senior officer candidate). An *Oberfeldwebel Zugführer* discusses a damaged engine component with the *Bordmechanik*, while the *Bordfunke* assists an *Obergefreiter 'Waffenwart'* to equip their Do17 for live firing exercises. Junior grade mechanics rarely bothered to fit rank insignia to work wear.

Upon completion, crews parade to receive their assignments. They were originally forwarded to *Waffenschule* (fighting school) for continued practice on newer aircraft types. These 'holding posts' lasted a few days to several weeks, until frontline units required replacements.

Quickly inundated, the *Waffenschulen* were disbanded in 1940. Fuel shortages and aircraft requisition for transport use eventually made *Grosskampffliegerschulen* unsustainable. In July 1943 they became combat units, re-titled *Kampfgeschwadern 101–105*.

F: HE111 KAMPFFLIEGER, 1943

After all the training, crews eventually had to face their first battle, a transition 'eased' by the *10.Ergänzungsstaffel* (completion squadron) attached to most *Geschwadern* during 1940, replacing the defunct *Waffenschulen*. The *Staffel* comprised nine new crews under the guidance of three veteran *Lehrbesatzungen* (instructor crews, on temporary relief from frontline duties). Missions were generally flown against partisan encampments behind

Damage ratios were expressed as percentages: 1–9 per cent (superficial), readily patched by ground crew; 10–24 per cent (light), requiring repair or replacement of small components; 25–39 per cent (moderate), complete inspection of damaged area; 40–44 per cent (major), replacement of engines or control systems (electrical, hydraulic, mechanical); 45–59 per cent (severe), replacement of major sections (wings, stabilizers, undercarriage, etc.); 60–80 per cent (beyond repair), cannibalized for spare parts; 81–99 per cent (effective total loss), unsuitable for major parts salvage; 100 per cent (total loss), destroyed or unrecoverable (inaccessible or enemy territory). This II./KG30 Ju88 force-landed on a Scandinavian ice floe with relatively light, though clearly critical, damage. The rescue party member wears the rarely seen *Wettermantel* (raincoat). (Kristof Dongleur)



German lines, but these were sometimes well defended and losses were incurred. 10.Staffel provided replacement crews for the frontline *Gruppen* as required and was soon supplemented by an 11. and 12.Staffel, forming a complete IV.Ergänzungsgruppe. Attrition rates later necessitated 13., 14. and sometimes even a 15.Staffel to the IV.Gruppe.

1: Beobachter, IV. (Ergänzungsgruppe)/KG27 'Boelcke', Kursk

Although never intended for first-line use, many Eastern Front *Geschwadern* were forced to mobilize their IV.(Erg.)Gruppe during major offensives. Striking enemy reserve and partisan units, supply columns, road junctions or railway marshalling yards, this 14.Staffel Feldweibel, based at Karkov, receives his premature baptism of fire in Operation *Zitadelle*. The 'Lotfe' bombsight gave outstanding accuracy, placing bombs within 25m of the release point. A sliding floor-hatch covers the sight, enabling him to serve the A-Stand machine gun, and a small seat beside the pilot is provided for take-off and landing. He wears the limited-production *Fliegerjackede So/40*, with wool-knit collar and waistband and improvised rank insignia applied directly to the sleeve.

2: Bordfunker, III./KG40, North Atlantic

Engaged in maritime operations, KG40 employed FW200s for high-altitude reconnaissance, while their bombers mined harbours and attacked Allied convoys. The 'Verfahren *Steckrube*' (turnip method) involved extremely hairy low-level diagonal passes, slicing the bomb through the target's waterline. After one such raid against Royal Naval and merchant vessels making for Narvik in September 1940, an He111 returned with the tip of a ship's mast rammed into its underbelly. Twenty-four-hour daylight ensured great accuracy, but receding ice floes from December to April enabled convoys to venture further north into Arctic waters, out of most bomber ranges. Based at Bordeaux-Merignac, this 9.Staffel Obergefreiter transmits position fixes and weather updates as they shadow the convoy.

3: Flugzeugführer, II./KG55 'Greif', Stalingrad

By 1943 most He111s, and often the *Kampfgeschwadern* themselves, had been reassigned for transport duties. Inspired by the successes of KG4 in relieving infantry units at

Kholm and Demjansk, the whole of KG55 was requisitioned to supply the besieged 6th Army at Stalingrad, evacuating 24,760 casualties in return flights. Operating close to the Heinkel's 22,000ft ceiling, this Leutnant hopes to avoid artillery attention, en route for Pitomnik airstrip. The glaring white landscape could seriously impair his judgement, concealing points of reference and scale, to make landing a particularly hazardous process. The last aircraft to escape (2 February) was piloted by Uffz Johann Boos, 9./KG55.

4: Bordschütze, I./KG26 'Löwen', Sicily

Operating from Salon de Provence, France, KG26 opposed the Allied Operation *Husky* landings (10 July 1943), attacking shipping, bridgeheads and ground units. Covering both *Seitenstand-links u. recht* (left and right beam guns), the Feldweibel might easily become entangled with his communications cable while hurriedly switching sides. To reduce the danger of oxygen masks separating unnoticed from the supply line, hose clamps are fixed to leather chest straps on flight clothing, alleviating tension on the coupling. Aluminium locking rings further reinforce these connections. With only a narrow foot ledge, it requires gymnastic balance to maintain his precarious perch and avoid stamping on the prone *Bordmechanik* during sudden moves or flak bursts. Window *Handgriffe* (hand grips) also assist maximum gun depression.

5: Bordmechanik, Einsatzstaffel/KG100 'Wiking', Mediterranean

Experienced crews were occasionally detached into temporary *Einsatzstaffeln* (special duties squadrons), performing specialist tasks during various campaigns. Between April and November, Einsatz./KG100 operated from Athens-Kalamaki, Greece, as the 'pathfinder' and *Beleuchter* (illumination) element for LG1, marking the target area with seven-minute parachute-flares, high-explosives and incendiary. The deceptively named *Lehrgeschwader* (demonstration group) was actually an elite combat unit. Its operational testing and development functions ensured high levels of expertise among crews, who were frequently despatched for special duties themselves. This Unteroffizier checks fuse setting and bomb release mechanisms in the bomb bay as they near Gibraltar.

G: STAB-III./KAMPFGESCHWADER 2 'HOLZHAMMER', GILZE-RIJEN, HOLLAND, 1944

Although short in duration, even seasoned veterans considered 'Steinbock' raids to be the most terrifying by far. British anti-aircraft defences were unrivalled and those fortunate enough to return invariably did so drenched in cold, clammy sweat, sore-eyed and mentally assaulted by what they had seen.

This rare snapshot taken by a Russian guard, c.1942, depicts an unfortunate aircrew Feldweibel wearing a prison-issue beret. According to official Soviet records, the Red Army captured some 2,388,000 German servicemen by 1945. Of these, 356,000 died of malnutrition, exhaustion or cold in labour camps and mines. The last survivors were repatriated during 1955.





Wounded airmen convalesce at a Luftwaffe hospital, tended by Luftwaffe-Sanitätspersonal and DRK nurses. In addition to Flak and bullet injuries, high-altitude crews could suffer frostbite, with the formation of ice crystals beneath the skin, rupturing cell tissues. As the crystals melt at lower altitude the condition becomes excruciatingly painful, with irreparable damage requiring amputation of fingers or toes. 192,594 Luftwaffe personnel (of all branches) had suffered wounds by the close of 1944, but records for 1945 are incomplete.

Returned Do217 crews of III.Gruppe-Stabsschwarm gather for interrogation by debriefing officers. A seasoned crewman himself, the Major cross checks the *Gefechtsbericht* (battle reports), collected by motorcyclist from each *Beobachter* directly after landing, building a detailed analysis of the mission. Claims of a particularly successful strike will require confirmation by photo-reconnaissance, usually undertaken by the responsible crew. An injured pilot explains how his mechanic and observer helped him from his seat to administer first aid, while the wireless operator took control of the aircraft. The *Sanitäts Stabsgefreiter* (note dark-blue *Waffenfarbe*), redresses his wounds prior to escorting him to the *Flugplatz-Lazarette* (base hospital). Men glance around the room to check that special friends have returned. They did not need to speak, just to know they were still alive. When at last they are released, the drained airmen trudge back to billets. They could find their friends, and discover who had not returned, tomorrow.

H: HAUPTMANN (FLUGZEUGFÜHRER BEOBACHTER) STAB./KAMPFGESCHWADER 76, KARSTÄDT, GERMANY, MAY 1945

By late 1944 the bomber arm was virtually dissolved altogether. Pilots were retrained on single-seat jet aircraft (killing over 200 in the process) and their crews transferred to other duties, frequently as infantrymen in savage street-fighting against advancing Soviet armour. An Arado-234 jet bomber pilot of the *Geschwader-Stabsstaffel* prepares for his last flight, seeking the westernmost Allied airbase – to surrender. From December 1944, fear of being mistaken for an American ‘*Gangsterflieger*’ by his compatriots prompted the wearing of recognition *Armbinden* (11).

Highly volatile and toxic ‘*J-Stoff*’ fuels spurred the production of *KW Fl.BR/41* suits in leather, a practical expedient based on its natural fire-retardant properties. The *Fliegerstahlhelm*, worn over a *Netzkopfhaube*, gives an appropriately futuristic appearance (12). *Nitsche u Günther Splitterschutzbrillen* (splinter protective goggles) are protected by their oval section metal case (13). He wears an *Armbandkompass*, fitted to the top of his boot via its extension

strap, and a Hanhart *Fliegerchronograph* (14), one of many excellent and highly prized timepieces. A most unusual item of flight equipment is the clutch pencil (15), tethered by lanyard to prevent loss in the cockpit (hazardous during evasive manoeuvres). Durable plastic-coated *Luft-Navigationskarten* (16) are tucked into the *Navigations-Ausrüstung für Flugzeugführer der Kriegverbände* (navigation set for aircraft commanders of bomber units). A mica-windowed pocket on the front flap held the user’s details. Inside are the contents list and maker’s nomenclature plate (17).

Details of items 1–10 appear throughout the main text.



‘*Ich hatt einen Kameraden*’. In a scene all too familiar in wartime, a cortege of *Kampfflieger* lay their comrade to rest. The two leading *Feldwebel* pallbearers wear the *Frontflugschleife für Kampfflieger* and *Bordfunken-Bordschützenabzeichen*. The man on the right wears the *Ärmelschild-Krim*, denoting at least three months’ service in the Crimean campaign, September 1941–July 1942. A total of 165,014 Luftwaffe personnel were killed in action, and a further 155,450 reported missing.

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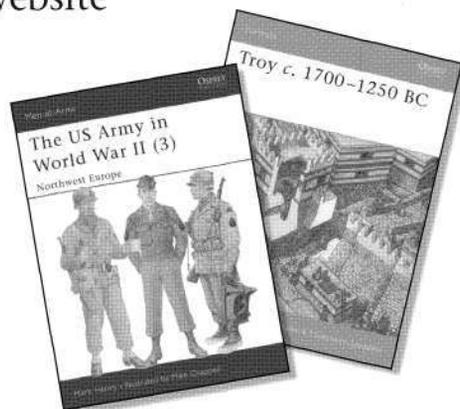
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