



***JAGDFLIEGER:*
LUFTWAFFE FIGHTER
PILOT 1939–45**



ROBERT F STEDMAN

ILLUSTRATED BY KARL KOPINSKI

ABOUT THE AUTHOR AND ILLUSTRATOR

ROBERT F STEDMAN has had a varied career that included working as a special effects technician, leather craftsman, sailmaker and porcelain restorer. He is a regular contributor to international militaria magazines and occasionally works as a military advisor to TV, film and theatre. Currently living in the south of England, Robert is a passionate collector of World War I and World War II military uniforms and equipment, and enjoys restoring uniforms in his spare time.

KARL KOPINSKI is an experienced illustrator who has worked in a wide variety of different formats, with a keen interest in Victorian portraiture and Napoleonic military art. He lives and works in Nottingham UK, this is his first project for Osprey Publishing.

WARRIOR • 122

JAGDFLIEGER: LUFTWAFFE FIGHTER PILOT 1939–45



ROBERT F STEDMAN

ILLUSTRATED BY KARL KOPINSKI

First published in Great Britain in 2008 by Osprey Publishing,
Midland House, West Way, Botley, Oxford, OX2 0PH, UK
443 Park Avenue South, New York, NY 10016, USA
E-mail: info@ospreypublishing.com

© 2008 Osprey Publishing Ltd.

All rights reserved. Apart from any fair dealing for the purpose of private study, research, criticism or review, as permitted under the Copyright, Designs and Patents Act, 1988, no part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, electrical, chemical, mechanical, optical, photocopying, recording or otherwise, without the prior written permission of the copyright owner. Inquiries should be addressed to the Publishers.

A CIP catalog record for this book is available from the British Library

ISBN: 978 1 84603 167 0

Page layout by Mark Holt
Index by Alison Worthington
Typeset in Sabon and Myriad Pro
Originated by PDQ
Printed in China through Worldprint Ltd

08 09 10 11 12 10 9 8 7 6 5 4 3 2 1

FOR A CATALOG OF ALL BOOKS PUBLISHED BY OSPREY MILITARY AND AVIATION PLEASE CONTACT:

NORTH AMERICA
Osprey Direct, c/o Random House Distribution Center, 400 Hahn Road,
Westminster, MD 21157
E-mail: info@ospreydirect.com

ALL OTHER REGIONS
Osprey Direct, The Book Service Ltd, Distribution Centre,
Colchester Road, Frating Green, Colchester, Essex, CO7 7DW, UK
Email: customerservice@ospreypublishing.com

Osprey Publishing is supporting the Woodland Trust, the UK's leading woodland conservation charity, by funding the dedication of trees.

www.ospreypublishing.com

ARTIST'S NOTE

Readers may care to note that the original paintings from which the colour plates in this book were prepared are available for private sale. The Publishers retain all reproduction copyright whatsoever. All enquiries should be addressed to:

Karl Kopinski
57 Bourne St
Netherfield
Nottingham
NG24 2FJ

The Publishers regret that they can enter into no correspondence upon this matter.

AUTHOR'S NOTE

There are innumerable works covering the famous aces in exhaustive detail (see Osprey's *Aircraft of the Aces* series), and while it is impossible to write such a book without mentioning these 'Experten' at all, here they are given only proportionate coverage. It is the experience, and essence, of the truly 'average' pilots and crewmen that I have attempted to capture. These were ordinary men, doing their best, in extraordinary circumstances. After many hundreds of hours in training, untold numbers did not survive beyond their first combat, or were cruelly taken in flying accidents before even meeting their foes. It is to these men that this modest work is respectfully dedicated.

Dem Unbekannten *Katschmarek*.

Der vordere schießt die tommys weg, der hintere fangt so manchen dreck,
ehrt leute – euren *Katschmarek*!

Readers are directed to the author's previous title, *Warrior 99: Kampflieger – Bomber Crewman of the Luftwaffe 1939–45* for additional information on various general aspects of Luftwaffe service, including uniforms and insignia, flight gear, parachutes, survival kits, and personal experiences common to both these arms of the air force.

ACKNOWLEDGEMENTS

My sincerest thanks, as always, go to my great friends: Martin Brayley for once again giving so freely of his knowledge, advice, reference material and moral support; to Walter Glomp for his patient and detailed translations, as well as insights into German thinking; as ever, to Mark Taylor for his many hours of painstaking research, tracking down and calculating answers, whenever I had written myself into a corner; also to my new-found and much-valued friend Peter Spoden, to whom I owe the greatest of thanks for so openly sharing his memories and time.

For generously sharing their own memoirs and thoughts, I respectfully and sincerely thank Luftwaffe veterans, Norbert Hannig, Willi Holtfreter (interviewed by James Holland), Karl-Heinz Mewes, Günther Rall, Klaus Scheer and Peter Spoden.

For additional information or the gracious loan of original photographs, Martin Brayley, Kristof Dongleur, Kevin Kelly, Alfredo Meletti, Tony Sara and Mark Taylor.

A very special thank you is reserved for my editor, Kate Flintham, for her outstanding patience.



CONTENTS

INTRODUCTION <i>Jagdflieger</i>	4
CHRONOLOGY	5
RECRUITMENT AND TRAINING Induction and medical examination . Evaluation and selection	7
CONDITIONS OF SERVICE Barracks . Rations . Off-duty . Promotion . Crime and punishment . Damage	14
APPEARANCE AND EQUIPMENT Flight gear . Survival equipment . Awards: mission clasps . Awards: victory criteria . Presentation	20
BELIEF AND BELONGING Camaraderie . Chivalry . Friends and rivals . Attitudes to leadership	28
ON CAMPAIGN Command and logistics . Operational airstrips . Accomodation . Diet . Morale	35
BATTLE Preparation . Take-off . Bomber escorts . Destroyers . Night-fighters . Day-bomber interception . Dogfighting . <i>Abschuß!</i> . Landing . Defeat	41
INDEX	64

JAGDFLIEGER: FIGHTER CREWMAN OF THE LUFTWAFFE 1939-45

Despite any perceptions of 'glamour', the real war that the *Jagdflieger* had to endure involved great mental and physical strain, and it took enormous courage to return to the fray, again and again, despite his overstretched nerves. He ran the daily risk of death or severe wounds – loss of limbs, paralysis, or disfiguring burns; and he usually lost the best friends he would ever have. His personal conflict usually stayed with him long after the war, the memories – and even feelings of survivor-guilt – often intensifying over the years. (Tony Sara)

INTRODUCTION

The fighter arm was regarded as the lesser branch of pre-war Luftwaffe airpower: the bomber – particularly the dive-bomber – was to be the war-winning element. The primary function of the *Jagdwaaffe* (fighter arm) was to achieve and secure air superiority, without which all strategic operations would suffer heavily, if not fail. This goal was achieved over Poland in 1939, France in 1940 and Russia in 1941; it was very nearly achieved over England in 1940, and later over Malta, but in those cases the prize was ultimately lost through German underestimation of the fighter arm's achievements, and untimely switches of target.

Invariably starting campaigns in style, the fighters were before long pushed onto the defensive, becoming and remaining over-tasked. Although the pilots were consistently able to inflict heavy casualties upon their enemies, these were short-term victories of little or no strategic value, since the Allies' greater resources allowed such losses to be replaced. The destruction of enemy day-fighters, even in great number, had diminishing effects, and as the strength of the USAAF bomber force in England steadily increased in 1943–44 even the occasional slaughter of these 'heavy babies' ceased to threaten Allied strategic aims. The achievements of the night-fighters, in their struggle to prevent British bombers from reaching their targets, were of far greater value to the defence of German industry, military capability and civilian population; yet these victories, too, were of limited effect against such overwhelming odds. The fighter arm was constantly forced to evolve and adapt, and met every challenge that was thrown at it (and not always from its enemies).

Jagdflieger (fighter crewman)

The Luftwaffe produced all of the world's leading *Experten* (aces), a small number achieving three-figure totals of aerial victories that are never likely to be equalled. Even by night, a few were able to out-perform the best Allied pilots' daylight achievements. These men represented a tiny percentage of Luftwaffe fighter pilots, but today they too-frequently monopolize the attention of commentators. The average fighter pilot was no ace.



Like all fighter pilots of the day, he had undergone up to two years of training before his first combat mission. Many did not survive that first engagement; and for those who did, most of their subsequent combats were inconclusive. At best, the average pilot may have inflicted some damage on a few enemy aircraft, but he seldom brought one down. In time he might develop the necessary instincts to do so, but this was generally a slow process.

The one key difference between the *Jagdflieger* and his foreign contemporaries was the duration of his frontline service. Assuming he survived, he had no option but to continue in a task that most others endured for only a limited period; those Allied pilots who returned to squadron service after completing a tour of several months, and a period instructing or performing some other rear-area task, did so by choice. The odds were stacked against the German aircrews' survival; nevertheless, to most of the pilots, radio-operators and gunners, supported by their ground-crews, all that mattered was to be *Jagdflieger*.

CHRONOLOGY

Some milestone dates in the history of the *Jagdwaaffe*:

1935

September Maiden flight of Messerschmitt Bf109 single-seat, single-engined fighter

1936

12 May Maiden flight of Messerschmitt Bf110 two-seat, twin-engined fighter

1939

1 June Maiden flight of Focke-Wulf Fw190 single-seat, single-engined fighter

1940

17 May Bf109s of 1./JG3 destroy complete formation of 13 RAF Bristol Blenheim bombers near St Quentin, without loss

8/9 July

First *Nacht-Abschuss* (night victory), by O/Fw Paul Forster in Bf109 of 4.(Nacht)/JG2, off Heligoland

October

Göring orders one *Staffel* of each *Jagdgruppe* to be re-equipped as *Jagdbomber* (fighter-bombers – JaBo)

1941

18 April JG27 arrives in North Africa (thereafter known as the *Afrika-Geschwader*)

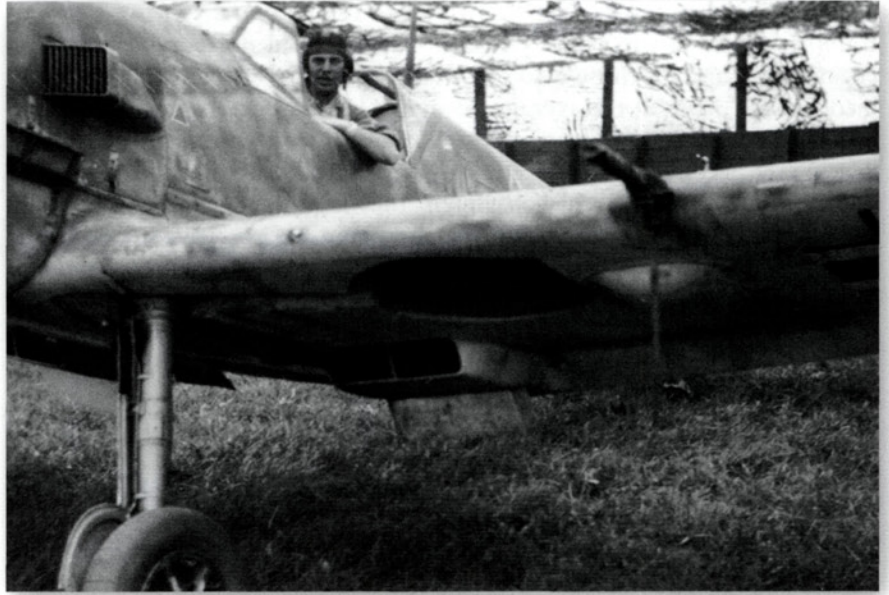
27 September

Combat debut of Fw190

1942

11/13 Feb Operation *Cerberus*: 250 day, night and heavy fighters provide cover for capital ships *Scharnhorst*, *Gneisenau* and *Prinz Eugen*

A pilot poses in his Messerschmitt Bf109E in a camouflaged dispersal pen, c. 1941. Unlike some elements of the other services, the Luftwaffe was operating at full stretch from early in the war, and the strain on men and equipment merely got worse as the months and years passed. (Kristof Dogleur)



sailing from French Atlantic ports eastwards through English Channel. Over 200 attacks are repulsed, 49 British aircraft shot down for 9 losses

18 July

Maiden flight of Me262 twin-jet fighter/ fighter-bomber

1943

17 August

377 USAAF B-17s raid Schweinfurt and Regensburg, losing 60 to Luftwaffe Flak with more than 500 fighter attacks

14 October

291 B-17s repeat the attacks, again losing 60, with 138 returning damaged, including 17 beyond repair

1944

30 March

Nuremberg raid: 710 RAF night bombers approach city in single stream, without customary diversionary manoeuvres. *Nachtjäger* bring down 94, their most successful engagement. British temporarily abandon deep-penetration raids

October

Introduction of Focke-Wulf Ta152, high-altitude development of Fw190 with uprated engine and pressurized cockpit

1945

1 January

Operation *Bodenplatte* (flat earth): delayed commencement of air support for Ardennes offensive by low-level attacks on Allied airfields. Most of the c.495 Allied aircraft destroyed or badly damaged are on the ground, with minimal aircrew losses, but c.238 German fighters and their crews are lost

7 April

Rocket-firing Me262s of *Jagdverband* 44 destroy 25 B-17s in a few minutes; remaining bombers jettison their bombs and abandon mission

RECRUITMENT AND TRAINING

Between the ages of 10 and 14 many German boys joined the Deutsche Jungvolk (German Youth) movement, which replaced German participation in the World Scouts Organization (rejected as a 'Jewish-led spy network'). The DJ encouraged the acceptance by the new generation of order and authority, vital to the planned regeneration of Germany. From the DJ they progressed to the more overtly political Hitler Jugend (Hitler Youth); originally voluntary, from 1936 membership became compulsory for all 14-year-old boys. Regular drill and marches engendered discipline and team spirit, and an annual two-week camp encouraged leadership potential. The great majority seem to have taken pleasure in the opportunities available to them in the HJ, which included mountaineering, sailing, orienteering, and – of particular interest to those aspiring to Luftwaffe service – the chance to qualify as pilots at *HJ-Segelschule* (glider school).

Induction and medical examination

The fighter arm consistently enjoyed a ready supply of young hopefuls from which to choose. Some felt a strong sense of duty, others a wish to take a kind of personal revenge against the Allied nations for the hardships following World War I; but for many the personal challenge was the major spur. All shared the curiously innate human desire to fly, and responded to the appeal of the perceived 'glamour' of the fighter pilot's life (few could honestly have denied that the guaranteed interest of girls was a factor). None of these incentives, honourable or superficial, were sufficient to ensure success, of course: aircrew selection was a particularly rigorous process.

All aspiring aircrew had to undergo the basic induction routine. Each man took a series of tests to determine fitness for flight training, including examination of his heart, lungs, eyesight and depth perception, hearing, weight, balance and co-ordination. Luftwaffe medical examiners carried out some tests *en masse*, such as that designed to disclose renal infections. A small group of men would be called to fill a large beaker with urine, passing it down the line. The combined sample was then heated and a weak acid

Operational units

The largest permanent operational unit of fighters was the *Geschwader*, of between 108 and 144 aircraft at full strength; the appointment of *Geschwaderkommodore* was normally held by an officer with the rank of colonel or lieutenant-colonel (*Oberst, Oberstleutnant*). This command was categorized as a fighter, heavy-fighter ('destroyer') or night-fighter *Geschwader*, and was identified by an abbreviation of that category and Arabic numerals – e.g.

Jagdgeschwader JG26,
Zerstörergeschwader ZG76,
Nachtjagdgeschwader NJG6.

The *Geschwader* comprised three or four *Gruppen*; each *Gruppe* of between 27 and 36 machines was led by a *Gruppenkommandeur*, normally a major or captain (*Major, Hauptmann*), and was identified by a Roman numeral – e.g. III./JG26.

Each *Gruppe* comprised three *Staffeln* of between nine and 12 aircraft; the *Staffelkapitän* might be a captain, first lieutenant or lieutenant (*Hauptmann, Oberleutnant, Leutnant*). The *Staffel* was identified by an Arabic numeral – e.g. 7./JG26; these numbers ran continuously through the *Geschwader*, so that e.g. 7./, 8./ and 9./JG26 made up III./JG26.



Glider training was a prerequisite, but not a guarantee, of future pilot training. From April 1937 all civil clubs were amalgamated under the Party-run *Nationalsozialistische Fliegerkorps*; the NSFK winged-man insignia, rarely applied to gliders, can be seen on the nose of this GOE-3 Minimoa of 14. Gruppe, based at Bayern-Sud. A three-stage course built up to qualification for the C-Schien licence, for a five-minute sustained-altitude flight and passing an oral examination.

solution added. If it turned cloudy or an albumen developed, then some form of kidney disorder was present and each would have to be tested individually. If no trace was found, however, all were in the clear – thus saving a great deal of time. (Although sensible in theory, this test was not infallible; recruit Norbert Hannig managed to scrape through twice, despite having suffered incipient nephritis only months before – once by simply passing the beaker on to the next man without actually contributing to it, and later with the complicity of a sympathetic nurse.)

Evaluation and selection

Pilot selection commenced only after the recruit had completed six months of basic training with a *Flieger-Ersatzabteilung* (airmen replacement battalion, FlErsAbt), going through the traditional programme of physical education, foot drill, weapons training, basic military law and other essentials. Following this initiation, those displaying the basic mental, physical and practical aptitudes required were offered the chance to apply for further evaluation with a *Flug-Anwärterkompanie* (aircrew candidate company, FlAnwKomp); few declined. During the next two months the applicants were tested on general aeronautical subjects, their instructors constantly assessing their suitability for possible advancement to a pilot training centre. Unsuccessful

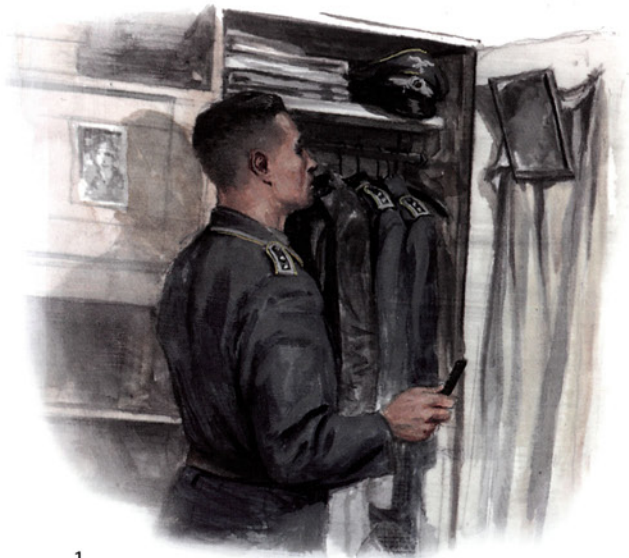


SPECIALIST TRAINING ESTABLISHMENTS, 1940

1. **Luftkriegsschule 5, Breslau-Schöngarten (formerly Wrocław-Strachowice), Poland**
An *Oberfeldwebel* (*Offizier-Anwärter*) prepares for daily studies, his locker displaying its correctly arranged contents (his silk dressing gown representing one of the extra privileges allowed). Professional officers served for an unlimited period, governed only by retirement, but *Kriegsoffiziere* were only obliged to serve for the duration of hostilities. With the coming of peace, they would be entitled to apply for acceptance and retraining as professional officers.
2. **Unteroffizierschule 1, Schloß Hubertusburg-Sachsen, Germany**
During basic training at *Flug Anwärterkompanie*, this *Obergefreiter* (*Uffz.Anwärter*) urges fellow trainees forward in an infantry section-attack exercise, at NCO school. Pre-war NCOs had been required to sign up for a minimum 12-year term (during their second year of conscription), although voluntarily extension to 18 years was always possible. NCO shortages prompted a reduction to 4½ years minimum service (excluding the more specialist careers) from July 1939, in order to attract more volunteers. Extended *Unteroffiziere* service was restricted to 12 years that October.
3. **Luftflotten-Nachrichtenschule 4, Budweis (formerly Budejovice), Czechoslovakia**
A trainee *Bordfunke* practises advanced radio procedure, under the expert tutelage of a *Stabsfeldwebel* instructor. Several good career paths existed within the *Luftnachrichtentruppe* (air-signals branch), including *Peilfunkeleiter* (radio direction-finder) and *Funk- and Fernsprechoberfeldwebeln* (radio and telephone senior sergeants), but this *Unterfeldwebel* intends to qualify as *Flugzeugfunkpersonal* (aircraft-radio personnel).
4. **3./Jagdfliegerschule 5, Toussus le Noble, France**
A newly-qualified pilot receives last-minute instruction, just prior to taking flight in a Heinkel He51 trainer. Fighter cadets were progressively introduced to a broad range of ever more powerful machines, culminating in recently-retired frontline models (often with impressive and important combat histories), ensuring great competence and versatility (a particularly vital quality). The *Hauptmann* instructor wears the distinctive, drop-tab holster, accommodating a Belgian FN, Walther PP(K), Mauser P34 or, as here, a Hungarian Femaru P37 pistol.

Inset

Schulterklappe for a *Feldwebel*, fitted with a strip of *Offizier-Litze* (piping) to denote potential-officer, and that for a *Flieger*, fitted with transverse *Unteroffizier-Tresse* (flat-lace) indicating NCO candidate.



1



2



3



4



Those not already qualified attended (before 1943) Luftwaffe glider schools; here, c. 1941, one of the nearly 21,000 trainees examined during the war years looks thoughtful as he prepares for a catapult-launch in a Grunau Baby IIB. On the ubiquitous K So/34 flight suit the instructor shows the 'double-wing' sleeve ranking of a *Feldwebel*.

training. Unfortunately, two months proved far too short a time to accurately identify suitable candidates (a fact highlighted by increased FLAnWKomp rejection rates), and by 1943 the FLAR course was extended to three or four months; but even this had effectively halved the waiting time.

Ground crew selection

Those found unsuitable for flight training were transferred from the FLAR to a FLERsAbt for completion of basic training, before starting specialist instruction in an alternative trade or branch. Conscripted recruits were generally simply reassigned according to aptitude and Luftwaffe needs, but others were able to request a particular alternative career path. After 14 days of aircrew evaluation at Berlin-Wansee, the 17-year-old Karl-Heinz Mewes was found unsuited to flight training; but since he had volunteered for the Luftwaffe immediately upon leaving school without waiting for his compulsory call-up, he was granted the privilege of choosing his favoured branch. With his combined natural interests in aviation and engineering, and having now learned some basic avionics, his choice seemed obvious; Mewes intended to remain with the flight branch, training as a ground crewman.

He soon found himself stationed in Lyon, France, for the next phase of evaluation. The three-week course combined intensive instruction in signals, gunnery and several mechanical and engineering disciplines, each section lasting two to three long and exhausting days. These were extended by never-ending assignments and homework, so that men found themselves operating on little more than three hours' sleep per night (a habit that would later stand them in

applicants were redirected to a *Flieger-Ausbildungsregiment* (airmen development regiment, FLAR) for selection and introductory training in a branch better suited to their skills. Consequently, the aircrew candidate had already been working his way through a training and sifting process for some eight months before he entered flight school proper.

While in peacetime this had been beneficial in preparing him for the intensive training he would eventually undergo, the attrition rates suffered by frontline units after the outbreak of war soon demanded a streamlining of the system. From early 1941 all new recruits were sent directly to FLAR for a two-month induction period, now combining elements of their basic training with a short but demanding aircrew evaluation course (comprising rudimentary navigation, MG-gunnery and aeromechanics), and a series of medical examinations. Those considered suitable then commenced more stringent examination with a FLAnWKomp, successful completion of which led to flight school; this shaved some six months off the time taken to identify a future pilot and commence his flight

good stead for frontline service). Despite his exhaustion, Mewes remembers his relentless instructors with great respect and even some affection: 'They were fast, thorough and efficient – they knew their job.' By the end of the course the highly-skilled tutors knew exactly to which discipline each man was best suited – 'there was no choice in this bit, it was made for you'.

Upon final completion of FLAR evaluation and before commencement of his specialist training at a *Flieger-Technische Schule*, the recruit was granted up to two weeks' home leave. Karl-Heinz Mewes recalls the pride he and his family felt when he returned in his brand-new uniform, but the intensity of the training schedule had taken its toll: 'I slept through most of it!'

Aircrew selection

Those selected for evaluation with a FLAnWKomp completed the remainder of their basic training programme (albeit reduced) concurrently with the next phase of the aircrew selection process. This involved a more intensive and detailed examination of the candidate's abilities, including demanding physical tests (which might include the use of oxygen apparatus and even time in a centrifuge), and ever-more-complex theory. Young hopeful Wilhelm Holtfreter recalled: 'There was a lot of classroom learning, and if you weren't good enough in class, you'd get thrown off the course. I had my glider-flying experience, but had to get my flying licence.' Those scrubbed from the course were quickly transferred to a FLERsAbt for full completion of basic training and allocation to suitable branches.

Basic flight training

Having survived initial induction and assessment, the candidate at last began flight training proper. Up to 60 circuits with an instructor generally proved sufficient before – with red warning pennants fixed to the wingtips, signifying his absolute right of way – the trainee made his first solo flight. Those

BELOW LEFT

Ground crewmen looking for usable components pick over French wrecks – already showing the handiwork of souvenir-hunters – at Villacoublay airfield, summer 1940; even an unmounted engine was a useful training aid. Many captured types were used for training in 1940–42, but after about March 1943 the shortage of spares limited the inventory to German and French aircraft.

BELOW

Flight practice always involved a great deal of simply waiting around; black/yellow quartered or crossed flags marked the waiting and exchange points on the airfield. At the start of each training day, stores personnel laid out an assortment of flying clothing beneath the flag, as well as flasks of coffee and snacks.





This trainee wears the sheepskin-lined KW 1/33 suit, K/33 helmet and Degea 295 goggles, vital in an open-cockpit trainer. The schools produced an average of 21,790 pilots per year, though precise figures varied widely. The student/instructor ratio was raised from 4:1 to 6:1 in wartime – which equated to about 320 extra hours of work per instructor per course. The schools' task became harder from winter 1942, when some 350 aircraft and 400 instructors were transferred to frontline service; and in 1943 their fuel allocation was nearly halved, grounding about two-thirds of the school aircraft.

considered unable to solo after about 80 circuits were returned to FLAR. Wilhelm Holtfreter remembered his first solo as an exciting but nerve-wracking experience: it was in a Fw44, on 23 January 1943 at Gross-Stein in Upper Silesia. 'I did five minutes. I was certainly happy to get down again in one piece.'

Progression through the elementary flying schools, *Flugzeugführerschulen A/B*, initially required the acquisition of four separate licences; the *A-*, *A2-*, *B-* and *B2-Schein*, introducing students to dual- and solo-control light aircraft, theoretical and practical navigation, and flight procedure. Practical experience was gained on high-powered single- and twin-engine aircraft during 100–150 flying hours. From late 1940, however, the urgent need to replace frontline casualties led to a radical acceleration of this programme, favouring practical experience and a speedier initiation to high-powered single-engine aircraft. The *A2* licence was dropped, and its curriculum was blended into the remaining phases; from the modified *A-Schein*, with increased dual- and solo flight time, students proceeded directly to the *B-Schein* stage, now devoted to the introduction to high-performance machines (generally obsolete combat types). Designed to enable rapid identification and advancement of prospective combat pilots, the accelerated programme inevitably resulted in a sharp rise in accidents, since novice pilots with only limited solo experience were severely tested by any unexpected idiosyncrasies of these more powerful aircraft. Stalls, spins or temporary loss of control that might have been handled easily by an even slightly more experienced pilot occasionally led to disaster; and even if they avoided anything worse, the notoriously tricky ground-handling characteristics of the Bf109 cost many pilots a collapsed undercarriage. Although the seasoned instructors rarely misjudged their students' capabilities, flight school

accidents peaked in 1943, with no fewer than 23.5 per cent of training flights resulting in the loss of an aircraft (generally during landings).

Those who had mastered rudimentary flight were then schooled in the arts of advanced navigation and flight theory, and introduced to twin-engined aircraft, all of which culminated in the *B2* licence. A newly-introduced *K1 Kunstflug* (stunt-flying) course, which ran simultaneously, further revealed the natural fighter pilots in the class. Having accrued between 100 and 200 flying hours (by 1943, in as little as six to nine months), pilots were then assigned to either twin- or single-engine training, based upon continuous evaluation of their skills and character.

Single-engine pilots

Pilots selected for short-range fighter and dive-bomber training each had their specialist schools, at which flying time totals were initially raised to some 150–200 hours over a leisurely 13-month period. By the close of 1943, however, a potential fighter pilot could expect to be forwarded directly from *A/B-Schule* to *Jagdfliegerschule* (fighter school), where special attention was paid to formation flying and gunnery, to accrue the same 50 hours' flight time in just three to four

months. The intensity of the course meant that trainees now received an average 12½ to 16 hours' flying per month – three or four times the peacetime norms. If no space was immediately available at one of the fighter schools proper the trainee might temporarily be assigned to a *Jagdfliegererschule* (intermediate fighter school), usually amounting to around 15 hours of basic aerobatic flying. Upon completion of JFS the late-war pilot would join his future *Geschwader's Ergänzungsgruppe* (finishing group), with a total of 180–250 flying hours amassed over a 9–13 month period.

Multi-engine pilots

Those A/B-Schule graduates demonstrating sufficient mastery of twin-engine trainers were destined for future service with bomber, transport, reconnaissance and heavy fighter ('destroyer') units; they were immediately advanced to C-Schule for an additional 50–70 hours on heavy aircraft over the next two to six months. This included introductions to instrument-flying and direction-finding apparatus on aircraft such as the Ju52 tri-motor transport. From here, pilots were separated and sent to appropriate schools, with those selected for the heavy-fighter arm attending *Zerstörerschule* for two to three months of gunnery and target flights. It was here that pilots were introduced to their wireless operator/air gunners, with whom they would continue their service. The crews would first attend blind-flying school, for an advanced instrument navigation course involving intensive instrument-flight and landing practice, along with advanced direction-finding technique. With a total of around 220–270 flying hours, after 20 months in training, the pilot and his *Bordfunke*r would finally join an operational *Ergänzungsstaffel*, to become a reserve crew.

Wireless operators/air gunners

Those unsuited to pilot training but still showing aircrew aptitude were initially sent from FlAnwKomp (and latterly direct from FlAR) to either *Beobachter-, Bordfunke*r-, *Bordmechanik-* or *Bordschützenschule* (observer, wireless operator, flight engineer or air gunner schools). Frequently joined by 'washed-out' trainee pilots from the *Flugzeugführerschulen*, future wireless operators would proceed to *Luftnachrichtenschule* for training in ground wireless operation (see Plate A3); those found unsuitable for aircrew would be reassigned to ground signals duties. At the air signals school they had nine months in which to learn basic wireless communication skills and attain 100 letters per minute in Morse code (reception and transmission), and were simultaneously expected to master elementary navigation. They attended other schools for actual flight practice and navigation, map-reading, radio-direction training and elementary aircraft engine instruction; and thence to air gunner school for a five-month course, including ground-based machine gun and small arms training, camera-gun practice aboard light trainer aircraft, and air-to-air machine gun firing. Completion of this particularly demanding training schedule, after some 16–18 months, brought eventual graduation as *Bordfunke*r, and assignment to specialist schools; the destroyer radio operator attended *Zerstörerschule*, where he was teamed up with his new pilot.

Gunnery

Until entering this final phase the emphasis had been almost entirely devoted to developing flying skills, with aerial gunnery a secondary concern. Typically,



Flight students endured 12-hour working days beginning at 6am, followed by four hours of study before lights-out at 10pm. These trainees revising their navigation technique are identifiable as officer cadets by the rearranged lockers in their room, the personal travelling clock, and a stoneware bottle of schnapps or Belgian *graanjenever* (just visible top right).



A *Leutnant* pilot, possibly of II./JG2 'Richthofen' at San Pietro, Italy, early 1943. He wears the smart and comfortable *Tropenanzug 41* tropical uniform, with officer's silver piping added to the *Tropenfliegermütze* cap. The most substantial building on the airfield was the *Flugleitung* (flight control office), with cement foundations and solid walls to protect its sensitive communications equipment. When conditions allowed, similar huts were built for accommodation, though generally the men had to put up with tents.

Willi Holtfreter had been in flight training for more than a year before he even began to practise such skills: 'They set up boards on the ground and we had to fly in and shoot. I shot 50 and hit 4 – that was gallery practice' (he adds, 'I got better'). While it might seem strange to invest so much time in training a pilot who might later prove a poor marksman, it must be remembered that flying was the tricky part, with take-off and landing accidents far more likely to kill him than aerial combat. 'The more planes you flew', said Holtfreter, 'the more experienced you got at handling the different types. We flew a lot of different types.' Accurate shooting would only come with time and under real combat conditions.

Operational training

Now fully trained, future combat pilots were originally sent to *Waffenschule* (fighting school), while awaiting assignment to operational units. Training at these establishments, usually staffed by combat veterans, was merely a continuation of instruction on appropriate aircraft types, and lasted from a few days to several weeks. From 1940 the role of the over-stretched fighting schools was largely – and effectively – taken over by the *Ergänzungsstaffeln* (later growing to entire *Gruppen*) attached to most operational *Geschwadern*. These 'finishing' squadrons provided new pilots and crews with the best possible introduction to frontline conditions and tactics, in surroundings as close as possible to actual combat. Flying as wingmen to experienced veterans 'resting' from frontline duties, the new pilots carried out relatively safe rear-area patrols, but missions occasionally included attacks on poorly-defended enemy

transport and reconnaissance machines if the opportunity arose. Transfer to one of the *Geschwader's* operational *Staffeln* was initially made only when a new man was considered experienced and dependable enough to join the '*alter hasen*' ('old hares') in combat; latterly, the pressure on manpower saw *Ergänzungsstaffeln* as a whole increasingly being committed to combat at need. By 1943 aircrew shortages had left many *Ergänzungsstaffeln* undermanned with suitable instructors, leading to their disbandment and the eventual reintroduction of the *Waffenschulen* (primarily for single-engine fighter pilots). The fledgeling pilots thereafter often suffered from a lack of practical mentoring before joining their combat squadrons.

Even when a pilot was fully qualified the training process was continuous, with new aircraft types and variants constantly entering service, and aircrews reassigned to new tasks.

CONDITIONS OF SERVICE

Barracks

Pre-war *Kaserne* barrack rooms, maintained at around 18°C with solid-fuel stoves, housed nine men in modest comfort. Each had a bed with mattress and a *Schrank* (locker) ranged around the walls, with two central tables and sufficient chairs, although no radios were permitted. In the various *Luftkriegsschulen*



Waiting at readiness, pilots of II./JG27 'Afrika' take their midday meal where they can; kitchen staff delivered the food from insulated containers (here into quite civilized chinaware rather than the usual aluminium mess tins, where it quickly cooled). The cable under the *Schwarmführer's* legs leads to a *Feldfernsprecher* 33 field telephone resting above his windscreen. Tropical survival kit stowed inside the aircraft included a standard K98k rifle, in the optimistic hope of shooting wild game.

about six men usually shared a room, and were permitted some freedom in their arrangements; it was common to partition the room with a wall of lockers, creating a large living and study area and a smaller bedroom. Each *Schrank* incorporated a small lockable compartment for personal items; these were still subject to inspection, if absolutely necessary, but could only be touched by the owner.

Rations

Following morning ablutions, all enlisted personnel reported to the cookhouse with *Kochgeschirr* (mess tins) and *Fettbüchse* (fat containers) to receive their daily cold rations. These comprised one-third of a loaf of bread, a pat of butter, a piece of cured sausage, cheese, jam and an apple or tomato. From these the individual would make his breakfast and supper to individual tastes, while a daily hot lunch would be served in the mess hall. Meal tickets, issued with morning rations, had to be presented to kitchen staff before receipt of the meal (though some chancers naturally found ways to fiddle the system to get second helpings). The quality of the meals remained consistently high; as Peter Spoden says, 'We had good food in the mess until the end of the war, officers the same as non-officers – I heard once that Göring himself was insisting [on this].' One aspect of ration allowance stands out clearly in Peter's memories to this day: 'For each flight we got an extra egg in the morning. Compared to the reduced rations of the civilian population, or to the infantrymen, we flyers were privileged.'

Base personnel enjoy the novelty of a brief run into town, though probably on official business; the sidecar bears what may be an early version of 1./JG51's chimneysweep insignia. Any short off-duty excursions were, of course, in addition to the basic annual leave entitlement of two weeks, plus six days at Christmas.



Off-duty

When not studying or working men could sometimes snatch a few hours off-base. Most wandered nearby towns or villages in small groups, perhaps enjoying a meal and a few drinks at a café. Eventually such jaunts became monotonous, and many chose to remain on base, catching up on sleep or just relaxing. The camp sports facilities or gymnasium could be used, or meals ordered from the base canteen. Officer pilots often joined their mechanics for a coffee and a chat, and regularly showed their appreciation with a round of weak 'Fliegerbier'. Despite their close and informal working relationship, this was seldom the case off-base, as officers and other ranks observed formal military courtesies in public. Men could receive up to three days off per week, but as an NCO and *Zugführer* (maintenance section leader) Karl-Heinz Mewes tended to absorb himself in study – it was vital that he remain abreast of aero-engine developments, enabling accurate diagnosis of any problem. When not studying aircraft he was studying for promotion, but always found the exams a struggle.

Promotion

At some point in their early training suitable recruits routinely attended a short course at *Unteroffizier-Schule* (non-commissioned officer school). One of the key elements of the programme was an intensive infantry leaders' course, in which the *Unteroffizier-Anwärter* (aspirant NCO) learned the importance of rapidly and correctly assessing situations, making prompt,

B

OBERLEUTNANT, 2./ZERSTÖRERGESCHWADER 2; DEBICA, POLAND, SEPTEMBER 1939

Near-total destruction of the Polish Air Force on the ground (by *Kampf-, Sturzkampf- and Schlachtgeschwadern*) left the fighters with relatively little to do, leading to much frustration and boredom. This continued throughout the 'Sitzkrieg' prior to the French campaign, when pilots were expressly forbidden from violating French airspace during border patrols. Both sides occasionally 'drifted' into foreign territory and engagements ensued, and a few were even shot down. This 'Spanier' (Spaniard), clearly elated at the rare prospect of aerial combat, displays the 'Spanisches Aussehen' (Spanish look), popular among *Legion Condor* veterans, comprising a private-purchase cloth jacket worn with issue breeches, officers' *Überschnallkoppel* leather belt and shoulder-strap.* Note commercially produced plastic pull-toggles, easing zip operation with gloved hands.

Insets

Around 50% of *Jagdwafler* pilots had seen action in Spain, many having earned the *Spanienkreuz mit Schwertern* (Spanish Cross with swords), of which 8,462 were awarded in bronze (1) and 8,304 in silver (to men of all branches, from 14 April 1939). Some might also wear the *Verwundetenabzeichen* (wound badge), introduced 22 May 1939, bestowed retrospectively upon those wounded in the Spanish Civil War. Requiring two wounds, just 182 black badges (2) were presented at that date and only one silver (four wounds); no gold badges (five wounds) were awarded. The hard-earned *Flugzeugführer-Abzeichen* (pilot badge) was accompanied by a *Verleihungsurkunde* (bestowal document). Metal badges, like this *Flugzeugführer-Beobachter-Abzeichen* (pilot-observer), were generally retained for service dress, while more practical embroidered versions could be acquired for flight clothing (3). With service dress, the regulation sidearm for *Offiziere, Fähnrich* and *Oberfähnrich* (junior and senior warrant officers) was the *Offizierdolch 37*, fitted with the aluminium-wire *Portepeee* (sword-knot) (4). During 1940, permission to wear this arm was progressively (and rather confusingly) extended to all senior Reserve-NCOs and senior NCOs who had previously earned the *Fliegerdolch* (flyers' dagger). The *Tragevorrichtung* (hanger) was fitted under the tunic at the left hip. Indispensable survival items include the Kadlec-designed *Armbandkompass 39* (5) and *Sitzfallschirm* seat parachute (6).

* This fashion faded during the battle for France, but made a brief reprise in early 1945.



1



2



3



4



5



6



well-informed decisions and effectively deploying men to deal with them, using clear and concise instructions. These skills were equally important when making reports to a senior rank in the correct manner. Graduates generally left with the rank of *Unteroffizier* (the most junior NCO grade and, confusingly, also the generic term for an NCO), or the really keen as *Feldwebel*, though failure to attain any rank would not exclude a man from future flight or specialist training (see Plate A2).

Those assessed as potential officer material during basic training were offered the chance to receive their rudimentary flight instruction at a *Luftkriegsschule* (air warfare school) with the status of *Kriegs-Offizieranwärter* (wartime officer aspirant), but would first have to undergo a two-month induction and evaluation period. Experienced enlisted men and NCOs from other branches – often from the *Flak-Artillerie* – could transfer in. The aspirant officers were organized into numbered companies, each comprising four lettered platoons (A–D *Zug* forming 1. *Kompanie*, etc.), the exact number of men per platoon varying slightly with intake. Air warfare schools offered an exhaustive curriculum of tactical and aviation theory and practical mechanical experience on various aircraft types. Students were confronted with a series of increasingly complex tasks, routinely featuring several duties demanding attention at once. On top of all these burdens, base patrols and guard rosters had to be drawn up and overseen, with minimal instruction from the tutors. This forced the cadets to prioritize, plan and share duties, taking account of their colleagues' opinions and abilities. Although they were still far from guaranteed elevation to officer status, their treatment by instructors was more restrained than during the initial stages of their training. They received instruction both in the behaviour expected of an officer of the Reich, and in social etiquette, and while they were allowed some freedoms they were also discreetly supervised; however, the emphasis was very much upon developing flight and leadership skills. Aircrew officers usually graduated as *Leutnant*, with a secondary discipline, such as engineering or signals (see Plate A1).

The Luftwaffe training system was designed to educate all ranks to a higher standard than their given rank; thus, each man was capable of executing tasks normally associated with the next higher grade, should he be called upon to do so. This also enabled all ranks to be comfortable in their respective roles, producing what many British servicemen regarded as the world's best NCOs and field-grade officers. The rate of progression through the ranks was seldom as swift as it became in other air forces, however; this was largely due to the fact that in the Luftwaffe, unlike most Allied air forces, no specific rank was required to fill any position. Thus, many very successful and highly experienced fighter pilots ended the war flying the most technologically advanced aircraft with relatively low ranks – some not even having qualified as NCOs.

One surprising aspect of the German armed forces was that their regular officers were forbidden from membership of any political party – including the NSDAP (Nazi Party) – this limitation long predating the formation of the Wehrmacht. While some pre-war regular officers were granted honorary membership, they were still forbidden any active role within the party. This restriction was not extended to *Kriegsoffiziere*, however.

Crime and punishment

With over 3,400,000 men serving in the Luftwaffe between 1939 and 1945, it was inevitable that a fair number committed the transgressions common to

This duty NCO in the Mediterranean theatre sports the 'Affenschaukel' ('monkey-swing'), a braided yellow lanyard ending in two short cords with yellow-metal ferrules; it was correctly worn looped under the right arm with the ferrules to the front. The lanyard denoted temporary assignment to supervise various activities – here, as take-off and landing director.





The push-up is perhaps the most favoured method of 'emphasizing a point' in armed forces the world over, and the Luftwaffe developed their own particular variation – with a seat-type parachute inverted on the shoulders. The almost invisible spot in the distance, left of the NCO's head, is a second miscreant, similarly burdened, catching his breath while running a circuit of the airfield.

all armies – lateness for duties, untidiness, or similar misdemeanours. These were typically punished, on the spot, with time-honoured penalties including press-ups, double-time circuits of the base in full field-order, or assuming a squatting position with rifle held outstretched – all at the discretion of the sentencing NCO. Drunken rowdiness was rare, however; Karl-Heinz Mewes recalls occasional off-base visits to bars in France, but witnessed no drunkenness, since 'this meant serious punishment: 48 hours in jail, or they would stop your pay'. Even when off-duty, men were seldom permitted a pass; their intake of refreshment could thus be strictly regulated with the specially brewed *Fliegerbier* (flyer's beer), containing only 1 per cent alcohol, available at the *Fliegerhorst Kasino* (airfield canteen).

One natural consequence of millions of very young men being posted far from home was a notable rise in the incidence of venereal disease. Regarded as a self-inflicted wound, this was severely dealt with; offenders generally received protracted stoppages of pay (difficult to explain to families expecting regular cash transfers), but might also suffer demotion or even a custodial sentence. In an effort to enforce prophylactic precautions, all men were required to carry at least one condom when leaving base, and to produce it on demand by the guard. Theoretically, there was no good excuse for contracting VD. A visit to the *Sanitätsoffizier* (MO) would dispel or confirm any suspicion, the airman hopefully being issued with a *Sanierschein* (sanitary note) declaring him '*Frei von Ungezeifer*' (literally, 'free from vermin'). Where men could not easily venture out (due to security considerations), some squadron commanders

managed to meet their needs by flying girls into the base to establish a temporary on-site brothel – as at the airfield of III./JG52 in Romania in 1940–41. On rare occasions, some senior commanders abused their position (and Luftwaffe transport) to arrange overseas liaisons with their ladies (espoused or otherwise), either flying them in or granting themselves a spell of absence for such encounters. The offenders were quickly relieved of command.

Damage

In cases of negligent or – far worse – suspected wilful damage to Luftwaffe property, the culprits were invariably brought before a court martial. Where damage was caused during flying operations the pilot was summoned to give a full explanation, and a thorough interrogation by air-accident investigators, combined with statements from all available witnesses, would determine his culpability. If he was deemed responsible his precise punishment was at the discretion of his CO, but it generally involved financial penalties and, perhaps, a period of suspension from flight duties. For instance, on 13 August 1942, Lt n Röhrig of I./JG53 was docked two-thirds of his pay for three months for having damaged two aircraft during a take-off accident; while such a fine contributed little toward the cost of repairs, it certainly ensured greater caution in future. No soldier could be tried for the same offence twice; to avoid the need to reconvene a court martial, a brief custodial sentence could be imposed.

Unnecessary loss of an aircraft was a very serious offence which might attract severe penalties. When he was an overzealous replacement wingman with 7./JG52, one O/Ltn Erich Hartmann broke all the rules in his determination to get a ‘kill’. He cut in ahead of his leader, Oberfähnrich Rossmann, instead of covering his attack, and in the swirling chase that ensued he was unable to relocate him, eventually having to crash-land an intact and expensive Bf109 with empty fuel tanks. Hartmann was severely reprimanded, fined, grounded for three days, and assigned to work with the maintenance section. This element of his punishment was the most constructive, since it taught him the true value of these machines, not simply in monetary terms but in the sheer volume of hard, physical labour invested in them by the ground crews.

Aside from indiscipline or the purely accidental, any man convicted of a more calculated crime was dealt with in the strictest fashion. Attempting to supplement their meagre diet, three pilots of JG54 were caught raiding the rabbit hutches outside meteorological staff billets in Russia. The ‘*Wetterfrösche*’ (‘weather frogs’) handed them over to the *Feldpolizei*, who duly charged the three with illegal entering and pilfering; they were summarily demoted by court martial and – in a ludicrous waste of highly-trained men – were transferred to a *Feld-Division*. Later captured by the Red Army, these unfortunates were eventually released only in 1949.¹

¹ Even the most senior ranks were not above larceny (the greatest looter of them all being *Reichsmarschall* Hermann Göring). The commanding general of *Fliegerkorps* II, Bruno Loerzer, grossly abused his position to smuggle trainloads of fresh oranges from Italy to Germany for personal financial gain. He was subsequently relieved of command, and only his valuable administrative skills ensured a discreet transfer to the personnel department. Less fortunate was Gen Bernhard Waber, commander of numerous air districts in eastern Europe and the Balkans, who was found guilty of large-scale black-marketeering and corruption and was executed in February 1945.



Three NCOs relaxing ; the right-hand *Feldwebel* wears *Fliegerhose*, introduced in 1935 with the *Fliegerbluse*, and identifiable by the button for tightening the bottom of the leg when worn with flying boots. He also wears the interesting soft-leather laced ankle boots with smooth or moulded soles; little is known about these, but the few period photographs all show aircraft use.

APPEARANCE & EQUIPMENT

Flight gear

Flight equipment and clothing was not retained by the individual airman, but was held and maintained by *Geschwader* stores, to be repaired, modified and reissued as required. All items issued to the airman were recorded in his *Soldbuch* (paybook), to be returned in the event of his transfer to another unit or according to seasonal change.

With sufficient funds (and a relaxed CO), many of the more flamboyant fighter pilots of frontline *Staffeln* acquired a non-regulation flight jacket – often locally-procured civilian leather motorcycling or driving jackets, usually adorned with the wearer's rank insignia and awards. Cloth types were far less common, but these too were generally converted from civil sportswear, even from ski jackets and smocks. Styles varied tremendously, depending upon origin, availability of materials, manufacturing skills and, of course, personal tastes and means. Rank epaulettes were often fitted to the shoulders, usually with issue buttons and 'stirrup loops', but sometimes sewn directly to the jacket (or even secured with safety pins). Breast eagles were frequently added, as were chain-stitched loops appropriately positioned to take the pins of awards and the prized *Flugzeugführer-Abzeichen* (see below). While not exclusive to fighter pilots, private-purchase *Fliegerjacke* nonetheless became almost a badge of this branch. Far less common was the acquisition of non-regulation *Fliegerhose* flight trousers; many of the earliest examples were simply modified wool service dress *Tuchhose*, with large cargo pockets added to the front thighs.

Survival equipment

The *Schwimmweste* provided buoyancy for up to 18 hours – theoretically, sufficient time for rescue. Once found, an airman in warm waters should

soon recover; however, if immersed in the icy winter seas he would begin to suffer the onset of hypothermia within just two or three minutes.

The lowering of the core body temperature (averaging 98.4°F) by as little as 4° is sufficient to induce this condition, in which the victim rapidly loses all mental acuity and co-ordination and is soon unable to do anything to help himself. It is worsened by shock, as caused by wounds, emotional distress and exhaustion – all common side-effects of being shot down. Unaided, he will quickly slip into unconsciousness, a further drop of 10°F leading to coma and death after just a few minutes of such extreme cold.

A ditched airman's best chance was to retrieve, inflate and board a dinghy in the shortest possible time. Single-seat aircraft originally carried an *Einmanschluchsboot* (one-man lifeboat) and medical equipment in special compartments within the fuselage, but operational use quickly revealed serious shortcomings: if forced to bale out over water the pilot had little hope of retrieving any of this kit before jumping. The chances of successfully ditching any aircraft at sea are extremely slim. The density of water is such that it exerts immediate braking force upon the airframe, as if hitting a solid object, invariably smashing any but the sturdiest fuselage. Larger types such as the Ju88 or Bf110 might fare slightly better, but the effects upon single-seat fighters were generally destructive, with baling out always the preferred option. Even if he did survive ditching it was extremely unlikely that a pilot could recover the survival pack before the aircraft sank, and many lost their lives needlessly. Peter Spoden of 5./NJG5 vividly remembers one heart-breaking incident over the North Sea in January 1944, when he was temporarily reassigned to daylight interception of USAAF bomber raids: 'One of our Bf110s shot down a B-17 and seven parachutes went down into the cold water.' Fully aware of the Americans' limited chances of survival, the night-fighters did all they could to help: '[we] informed our coast guard and stayed over them so our boats could find them. After 15 minutes, the boys did

BELOW

Ground crewmen of an Fw190 unit in Sicily or Italy, wearing a typical miscellany of *Drilllichanzug* work clothing, temperate and tropical uniform items. The *Unteroffizier* (second from left) wears an old *Fliegerbluse* stripped of its collar patches but retaining the NCO collar braid. They all wear poor-quality Italian M1912 ankle boots, known to Italian servicemen as 'cardboard shoes'.

BELOW RIGHT

From the same sequence, a group of pilots and ground-crew. The *Feldwebel* pilot (second from left) wears blue-grey *K So/41 Fliegerhose* over his closely-tailored tan tropical tunic. At right, note the very full cut of the *Tropenuberfallhose* (tropical assault trousers).





FAR LEFT

A *Feldwebel* fighter pilot wearing a fine example of a private-purchase *Fliegerjacke* in an off-white cloth; such jackets might feature half-length zip or button fastening, elasticated or drawstring waistbands, and a variety of pockets. He stands in front of his well-camouflaged Bf109; as the war progressed such concealment became even more necessary, and even maintenance was sometimes carried out under its cover. Some hidden aircraft were only discovered months after the war, betrayed by dying foliage. (Kevin Kelly)

LEFT

Fw190 pilots in NW Europe, representing in most respects the archetypal *Jagdflieger* from 1941 onwards. The *Oberfeldwebel* at left wears the complete *Zweitteilig* (two-piece) flight suit, here in the *Braunmeliert* (brown/grey mix) cloth previously used for the *K So/34*. His headgear is the peaked M1943 *Einheitsfliegermütze* (universal flyer's cap); and a ZZ-*Tabelle* wipe-clean noteboard sticks out of his left breast pocket. The *Feldwebel* at right has kept the old '*Schiffschen*' cap and, like many pilots, he wears just the trousers of the *K So/41* suit, here in the more common blue-grey. Both have elasticated garters looped for signal-pistol flares around their boot-tops; and both, unusually, carry their *LKp N101* flight helmets and *Dräger 10-6701* oxygen masks slung from safety equipment lanyards.

not give signals anymore, their heads falling down. Later on we heard that they were all dead [when found].'

This danger belatedly inspired the development of a simple pack that Luftwaffe aircrew could carry attached to their body at all times. The dinghy, packed with survival aids and rations, was carefully folded into a cover, the upper edge and sides of which fastened with press-studs. Designed to fit (relatively) comfortably under a suitably adjusted parachute harness, it was worn around the lumbar region, supported by a simple cross-strap arrangement over the shoulders. As he hit the water, the airman's immediate action was to free himself and swim clear of his parachute (an extremely hazardous encumbrance), and inflate his life preserver. He then had to pull open the right side of the survival pack to reveal the dinghy inflation canister; upon actuation, the remaining press-studs simply burst apart as the raft inflated behind him, while a tethering line prevented the dinghy drifting away (see Plate C11). This apparatus was one of the most highly valued items among an airman's survival equipment; even if he was fortunate enough not to need it, just the presence of the liferaft was greatly reassuring. Peter Spoden recalls: 'The lifeboats were a lot of fun to use in lakes [during regular practice sessions] ... Thank God I never had to use it in earnest, although I always carried it when flying over the North Sea or Baltic Sea.'

Immersion suit

While the dinghy greatly increased the airman's chances of survival, he might still suffer from the effects of severe cold, exacerbated by drenched clothing. Although not immediately life-threatening, this could become dangerous after prolonged exposure. From 1933 the requirements for survival at sea had influenced the production of flight suits; these were not simply categorized as summer- and winter-weight. The latter were now further subdivided according

to flight over land or sea, and employed materials with superior insulation properties. The unexpectedly severe conditions encountered in wartime led to accelerated research into protective immersion suits, culminating in the *Schaumgerät* (foam equipment).

Developed from a pre-war idea, this comprised a multi-layered *Zwischenweste* (inner vest), *Zwischenhose* (inner trousers), boot inserts and glove liners, each secured with drawstring closures to rubberized collar and cuffs. Each component was composed of an outer cellulose-acetate (poplin-type) shell of grey-green hue, with a viscose-silk lining. The outer layers were quilted together over a thick 'Wollinplush' synthetic pile layer, heavily impregnated with a special blend of powders (sodium bicarbonate, citric acid and a commercial foaming agent, 'Mersolat-30'), which quickly generated a dense foam cloud upon immersion. Although it possessed no heat-generating properties, when trapped within the wearer's outer flight clothing the blend produced a thick insulating emulsion, thereby preserving body heat. The *Schaumgerät* was certainly not intended as a substitute for the dinghy, but bought the wearer vital extra time while he struggled to inflate the raft, and greatly improved his condition once aboard; continued foaming action caused by wet clothing maintained the insulating emulsion and kept the airman relatively warm for some time. Klaus Scheer of NJG100 recalls that 'The crews were told that the *Schaumgerät* was good for eight to ten hours'; but he adds, 'I do not know of a case when this equipment was used in practice in the cold Baltic waters by any crew member.'¹

While it is not known how widespread its use was, or how effective it was, some 10,000 to 15,000 examples of the *Schaumgerät* were procured by the *Luftwaffe-Bekleidungs-Ampt* (clothing department) between early 1944 and

¹ Post-war testing by the RAF dismissed the suit as ineffective due to rapid dissipation of the foam; however, these tests appear to have been conducted without the outer flight suit, necessary to contain the foam cloud.



CLOTHING & EQUIPMENT

Fliegerschutzbrillen, with flip-down red filters, helped reduce searchlight flare by night, desert sun and snow glare (1). The 1936 K20/24v suit (2) was worn beneath unwired flight suits for use with heated gloves and boots. A contact at shoulder-blade level was provided for heated goggles. The modern 1941 *Fliegerhose* incorporated special stowage pockets for the 27mm flare-pistol and telescopic signal-flag (3), ten flare-cartridges and *Kappmesser 37* gravity-activated knife (4) and two wound-dressings (5) alongside numerous other survival items. An internal 'apron' was sometimes incorporated, providing some comfort and chafe protection (6). Noteworthy details include steel or cloth lanyard-securing loops, canvas pocket-supports, seat-reinforcing panels, electric cable exit position and leather bandage securing-loops. Security buttons or pull-tags were occasionally added by 'Fallschirmwarte' (parachute/safety equipment fitters) upon request (3-4). Early clothing manufacturers' labels provided vital, industrial targeting information to enemy intelligence, so in late 1942, a *Reichs-Betriebsnummer* (Imperial works number) system was adopted for secrecy (7). Some producers missed the point, however, and briefly used the *Rb.Nr.*, alongside their factory address! The three principal oxygen-mask types were the 2-strap *Dräger 10-69* (8), 3-strap *Auer 10-67* with chamois face protector (9) and double-strap *Dräger 10-6701* (10). Illustrated beside the 1-man lifeboat-pack (11), the contents of the 3-man survival-accessories pack, as detailed on its label (12), included medical kit, sun-shades and frostbite creams, with booklets detailing cold and sea survival techniques. Additional flare-cartridges were carried in commercially-produced *Patronengurt* belts of varying design (13), and *Patronenreimen* cartridge-straps (14), typically secured to upper calves. The 1.5 volt, 0.5 amp *Seenotleuchte* air-sea rescue signal light (15), with a battery duration of 8 hours, could be clipped to a lanyard (and left to float), or directly to the *Schwimmweste*, here an *SWp734 B-1* (16)



1



3

4

6

7

Knebl & Ditrich
INDJA (KONTIN)
IA

No. 0/0250/0245
Gr. II A

STRÜMPFE & SOHNENDE Knebl
Bismarckstr. 100/101
1943 *Knebl*
IIb



8

9

10



2

WISUNG
Baumwoll-Horbeck
Spannung 24 Volt
Erleucht 90 Watt
Gewicht: 2340g
Stark-Nr 2110
Größe:
Inf-Dat: IIa

5

Pektischen-Zylinder FIAT 005-3
in 8-20 (Mülltonnen)
1 Kammertüte, 1 Baumwollbeutel
je 6 Baumwollbeutel in 8-20
18 Stück je Tag, Handarbeit, Handarbeit
2 Stück je Tag, in 8-20, auch in
Druckluft, in 8-20
1 Baumwollbeutel
3 Stück je Tag - in 8-20, in 8-20
25 Schlauchzug-Lockentzuggr II



11



13



14

15



16

Größe: Schwimmweste
Baumwoll: Döner
Baumwoll: Sub 734
Größe-Nr: 10-30 8-1-2
Anforderungsnr.: F130154-1
Gewicht: 1,5 kg
Werknummer:
Tag der Herstellung:
Hersteller: KLEPPER-WERKE
ROSENHEIM

12

March 1945, primarily for the Eastern Front. Klaus Scheer says that night-fighter crews on the Russian Front used these suits when flying over the Baltic Sea between Finland and Russia; but while he remembers using the vest and trousers he does not recall the boot inserts or glove liners – ‘they were obviously too uncomfortable when using the rudders and trigger-buttons’.

Awards: mission clasps

On 30 January 1941 a series of *Frontflugspangen* (‘front-flight clasps’) in bronze, silver and gold colours was introduced to reward extended frontline service; the three classes were for 20, 60 and 110 missions respectively. A laurel wreath was flanked by oakleaf ‘wings’, and enclosed a central device symbolizing one of the three principal flight branches: bomber, reconnaissance and fighter. The *Frontflugspange für Jagd-, Zerstörer- und Schlachtverbände* (fighter, destroyer and ground-attack crews) featuring an upward-pointing arrow.

It was soon felt desirable to adopt new designs, reflecting the widely differing tasks and evolving duties of these branches (See Plate H). From 13 May 1942 a subtly modified *Frontflugspange für Zerstörer- und Schlachtverbände* was introduced, featuring a downward-pointing ‘intruder’ arrow to symbolize their long-range offensive role; thereafter the original style was reserved for day-fighter pilots, and titled the *Frontflugspange für Jäger*, its upward-pointing arrow now representing the short-range interceptor. On 14 August 1942 night-fighter crews received their own *Frontflugspange für Nachtjagdverbände*, distinguished by a chemically-blackened central wreath; again, the offensive *Fernnachtjäger* (long-range night-fighter) crews wore their clasps with an inverted arrow, while the defensive *Nachtjäger* wore an upward-pointing arrow.

Finally, on 12 April 1944, ground-attack crews were recognized with the unique *Frontflugspange für Schlachtverbände*, with crossed gladius swords in the centre to symbolize their close association with the infantry. The previous style, once shared with destroyer crews, was thereafter retained as the *Frontflugspange für Zerstörerverbände*.

Awards: victory criteria

The Wehrmacht as a whole operated an accumulated-points system in its award criteria, governing everything from specialist trade badges to Iron Crosses. The precise details varied between the different armed services, and the Luftwaffe elected for a flexible system reflecting the complex nature of their engagements:

- Destruction of single-engined aircraft – 1 point
- Destruction of twin-engined aircraft – 2 points
- Destruction of three- or four-engined aircraft – 3 points
- Damage to twin-engined aircraft – 1 point
- Damage to three- or four-engined aircraft – 2 points
- Final destruction of (damaged) twin-engined aircraft – ½ point
- Final destruction of (damaged) four-engined aircraft – 1 point

After a short initial period this system was no longer employed on the Eastern Front, in order to slow down the flood of applications for awards of the Knight’s Cross; thereafter individual aircraft destroyed were counted instead. Unlike in Allied air forces, claims for ‘shared kills’ were not accepted; in the event of a shared victory the pilots had to agree between themselves who

had the greater claim, and if no decision could be reached then the kill was simply credited to the unit as a whole. One strict ruling was always observed, however, in all theatres and for all ranks: no claim was accepted without the testimony of a witness.

Fighter pilots initially earned the Iron Cross 2nd Class for aerial victories equalling 1 point, while on the Eastern Front as many as three kills were required. Three points (or 7–10 aircraft in Russia) qualified him for the pin-backed Iron Cross 1st Class; alternatively, both could be awarded either for conspicuous acts of bravery or for continuous and outstanding efforts. It is for this latter achievement that the majority of *Bodenpersonal* (ground crewmen) earned their Iron Crosses. Within night-fighter units, however, mechanics routinely served as air-gunners; and if the pilot scored an *Abschuss*, the gunner was awarded the EKII for his share in the victory even if he hadn't fired a round (in fairness, just being there was an act worthy of the Iron Cross).

Ten aerial victories (totalling less than 20 points) were recognized with the silver *Ehrenpokal für besondere Leistung im Luftkrieg* (honour-goblet for particular achievement in the air war), engraved with name, unit and date of award (see Plate H). Twenty points (or 30 victories in the East), or acts of service not meriting the Knight's Cross, earned the ornate and striking *Deutscheskreuz* in gold. The size and style of this decoration prompted many irreverent nicknames, including *Spiegelei* (fried egg), *Ritterkreuz-Stopper* (for its seeming ability to prevent the subsequent award of the Knight's Cross), and – from its large central swastika motif – *Parteiabzeichen für Kurzsichtige* (party badge for the short-sighted).

Forty points earned the *Ritterkreuz des Eisernes Kreuz* (Knight's Cross of the Iron Cross), the highest award the Wehrmacht could bestow. This score originally equated to around 20 *Ostfront* victories in 1941, the requirement quickly rising to 45–50 victories in 1942, reaching 80 by 1943 and over 100 by 1944. This award was progressively upgraded with supplementary fixtures: 120 victories on any front earned the silver *Eichenlaub* (oak leaf cluster), 200 victories the *Schwerter* (crossed swords), and 250 the *Brillianten* (diamonds – which were actual diamond chips).

Presentation

Awards were conferred at the discretion of *Geschwader* headquarters, upon the written request of the Gruppe commander. If the board was satisfied with the application and witness statements the latter was notified by teleprinter (from which date the award was valid), and the medal, with accompanying *Besitzzeugnis* (award document), was dispatched to him. In western Europe



Feldwebel Rudolf Müller of 6./JG5, saluted by officers after being decorated with the Knight's Cross at an airfield on the Murmansk front, June 1942 – by tradition, on that day the new *Ritterkreuzträger* was saluted by all ranks, and saluted no-one. He already wears on his left breast the pin-back Iron Cross 1st class below a mission clasp, and on his right the German Cross in gold. The 21-year-old Müller was at that date the youngest recipient of the *Ritterkreuz*; he would be posted missing on 19 April 1943.

the medal might even reach its destination within a few hours, but more distant units invariably had to wait days or weeks for its arrival. Rather than wait, however, a squadron commander might often unpin the Iron Cross 1st Class from his own tunic and present it to the recipient during these increasingly impromptu ceremonies. (This practice extended to promotions, with a captain prising the stars from his own shoulder straps to present to a newly promoted lieutenant.) When the new award later arrived with the squadron the presenting officer simply retained it as his replacement (German decorations were not physically named to the recipient). This process was frequently repeated several times, as successive pilots were promoted to *Staffelkapitän* and had the pleasure of making such presentations themselves. Consequently, surviving examples may well have travelled some way through one or more units before reaching the final owner.

The Bf109 mechanic Karl-Heinz Mewes felt that 'the EKII was OK, but you only wore the ribbon' (the medal itself was usually only worn on the day of presentation). The EKI was his favourite, 'as you got to wear all of it'. Mewes was particularly proud of the fact that all the men in his *Zug* had earned the EKII, while he had both classes. Unlike the occasionally well-travelled EKI, presentation of the higher awards tended to be rather more predictable; these generally had just one owner and, since they were earned over a fairly protracted period, there was generally plenty of time to order an example (always assuming the intended recipient survived long enough to receive it). The presentation ceremony itself was a slightly grander affair, attended by Gruppe (if not *Geschwader*) representatives, but it still retained an informal and excited air. The Iron Cross, in both classes, was generally regarded as a mark of the individual's achievements; the Knight's Cross seemed in some sense to be shared by the entire *Staffel*, with each man feeling that he held a tiny share in it.

It was not exclusively pilots who could build up high scores: in the multi-seat destroyer and night-fighter units it was occasionally possible for the rear-seat man to attain 'ace' status too. The Gruppe commander of I./NJG6, Peter Spoden, recalls that 'If an air-gunner made an *Abschuss*, he would be credited with the victory, and the same if the radio-operator claimed one.' However, Hptm Spoden always felt that if *his* gunner had to fire, he would have failed in his own job as pilot. 'Of course, in most cases the pilot was shooting and got the claim. I always avoided coming under fire from the rear – with the help of radar, which recognized the Mosquito early enough.' Furthermore, he believed that a good radar operator should spend all his time locating and tracking targets, knowing exactly how many aircraft were in the area and where they were; if the operator had to resort to his guns, he too had been caught out. That said, there were inevitably times when it became necessary: Lt Karl Johanssen, the radio operator of IV./NJG6 *Gruppenkommandeur*, *Hauptmann* Martin Becker, 'shot down several *viermots* when "Tino" Becker was out of ammunition. Johansen got the *Ritterkreuz* later on.'

BELIEF & BELONGING

Camaraderie

Notwithstanding fundamental military discipline, the relationship between officers, NCOs and other ranks within Luftwaffe aircrews was very close. This familiarity also extended to their relationship with their ground



April 1940: the 'Sitzkrieg' ('sitting war') – a snapshot of Oberleutnant Max Dobislav, Staffelfeldkapitan of 3./JG1, relaxing and listening to the wireless at Gymnich, Germany. Within weeks he would be bringing down his first Spitfire over Calais, and was appointed Gruppenkommandeur of III. /JG1 that September. Dobislav later served as chief instructor at Jagfliegerschule 1, Werneuchen; and for about three weeks he commanded I./JG101, before the *Geschwader* was disbanded in April 1945 and its 2,400 personnel were absorbed into 10. and 11. Fallschirmjäger Divisionen. Many thousands of flying-branch personnel ended their war remustered as ground troops.

crewmembers, with whom they were often on first-name terms. The fact that the Luftwaffe was the 'new' arm of the Wehrmacht enabled the fostering of a far greater *esprit de corps* than existed in many older foreign air forces, though this was by no means an easy task. The majority of pre-war officers were drawn from the higher social classes, primarily transferred Army and Navy volunteers, who brought many of their prejudices with them. While their experience was vital to the rapid formation of a viable force, some regarded their NCOs and enlisted men, recruited from lower social strata, with barely-concealed disdain. Thankfully, the inherent pioneering spirit engendered a fiercely modern outlook within the Luftwaffe, placing far greater weight on a man's capabilities than his background or insignia.

Combat and tactical briefings were routinely given by the most experienced pilots, regardless of rank; thus lieutenants and captains frequently found themselves instructed by NCOs, and even flying as wingmen to their junior ranks; the great majority accepted the self-evident logic behind this policy.

Chivalry

General Galland was perhaps deceiving himself in believing all German aircrews to be chivalrous knights of the air, and in insisting that the traditions of mutual regard between adversaries had been upheld throughout the war in accordance with Luftwaffe standing orders. Some Allied airmen refute such claims, however, having taken fire from Luftwaffe aircraft while dangling helplessly beneath their parachutes. It must be noted that in the heat of aerial combat passing gunfire was not necessarily intended for baled-out airmen drifting through the ongoing battle, but there were unquestionably instances of base behaviour.

Some resulted from simple over-zealousness: Uffz Peter Crump of 5./JG26 had just forced down an American P-51 when he spotted his keen young

An airman enjoys a lighter moment with two of the *Staffel* mechanics on an airfield in southern France, 1943. *Staffel* pilots reported any problems with their machines to the 'Erste-Warte' (crew chief), who detailed his four *Zugführer* (section leaders), who in turn instructed their 15-man *Zugge*.



wingman, Uffz Hans Meyer, lining up for the kill as the crippled Mustang lowered its wheels, and shouted angrily to his comrade, 'Stop that, Meyer – he's landing!'

Against this, it must be acknowledged that USAAF fighter pilots are known to have deliberately targeted civilian refugee columns (most infamously, those fleeing Dresden in 1945), and also shot at parachuting German airmen.¹ Some gun-camera footage even records attacks on wounded airmen on the ground – indeed, in the closing months of the war, orders to do so in the case of baled-out Me262 jet pilots were expressly issued. In August 1944, Willi Holtfreter of JG53 was shot down in a battle against American P-51s, and was hit in the arm and leg when machine-gunned while parachuting down. *Leutnant* Norbert Hannig of JG54 took part in one particularly costly attack with just 12 Fw190s against an armada of 250 USAAF bombers escorted by dozens of P-51s; one *Jagdflieger* landed with engine trouble, two returned damaged, and five made emergency or crash landings, their pilots dead or dying. Of four pilots who baled out two were shot and killed under their parachutes. One of

¹ Not all attacks targeted enemy airmen, however. Early in 1941, shipbuilder Charles Stedman was strafed twice in one week by a Bf109 (presumably flown by the same pilot) as he cycled to work at Southampton Dockyard. Both attacks were low-level passes at close range, and therefore well under the aircraft's zeroed point of aim, causing the bullets to strike either side of Mr Stedman in true 'Hollywood style'. The pilot would clearly have known he was too low for accurate fire, so it would seem that his motive was simply 'entertainment'. Unsurprisingly, my grandfather failed to see the funny side.

the others came to earth in a potato field; quickly ridding himself of his harness, he had to dive for cover when four P-51s spotted his parachute canopy and strafed it one after the other.

For the most part, when confronted by an injured man – even an enemy – basic humanity will come to the fore. Already severely wounded, JG2 pilot Uffz Dilthey parachuted into the Channel off Folkestone on 23 September 1940; he would certainly have drowned had a nearby British soldier not swum out to him, keeping him afloat until both could be rescued by a fishing boat. Such compassion would be far less noted on the Eastern Front, where all fighting was characterized by brutality. This could sometimes reach bizarre extremes; Red Air Force pilot Lt Vladimir D. Lavrinyekov critically damaged a Bf109 and watched it crash-land in a field. Circling above, he noticed the pilot clamber from the wreckage and run for cover in a nearby ditch. Landing his fighter immediately beside the Messerschmitt, Lavrinyekov bounded from his cockpit and raced toward the ditch – where he strangled the German pilot to death, before returning to his aircraft and taking off again.

There were clearly good and bad on all sides, and we who have never been through such traumatic experiences have no right to judge.

Friends and rivals

Chivalrous or not, a strong competitive spirit undeniably ran through the upper echelons of *Experten* (aces), frequently bordering on the obsessive (this is illustrated by Galland's well-known frustration at having to join a weekend shooting-party with Göring while his closest rivals were busy closing the gap on his lead). The majority of *Jagdflieger* did not share this attitude, wishing only to do their job well, and survive. While it is true that 'doing the job well' inherently meant shooting down enemy aircraft, this was generally viewed almost as a by-product of their duty rather than its sole purpose; few had joined the *Jagdwaaffe* in the conscious pursuit of medals. Maintaining the trust and respect of their comrades was the only thing that really mattered. High-scoring pilots often stood down from scheduled missions to allow friends to take their place, giving them the chance to raise their own tallies to landmark figures and earn awards. Like everyone else, the non- or lower-scoring pilots were genuinely pleased for their leading men.

All were aware that their own victories depended upon someone else's loss – frequently, the loss of his life. Regardless of nationality the enemy was still a human being and a fellow airman, and it is a cliché of pilots' memoirs from all countries that they felt they were shooting at the machine, not the man. In the event of an *Aschuss* pilots frequently watched for and counted parachutes as the crew baled out. Circling over the kill, the pilot could visualize the slow-motion chaos unfolding within the twisting fuselage; any sense of euphoria was short-lived, replaced by the consciousness of being a helpless witness to suffering. This sensation was particularly acute with heavy bombers, which seemed to fall languorously while their large crews tried desperately to escape. With eyes transfixed by the wildly inverted *Viermot*, the victor might find

Feldwebel 'Bazi' Sterr (left) and Albin Wolf of II./JG54, both later awarded the *Ritterkreuz*, were inseparable friends; Sterr was killed on the Eastern Front in April 1944, Sterr in the West that November. By late 1944 the *Jagdflieger* were fighting simply for one another – they knew they stood no chance of victory, but the war had become an inescapable way of life.



himself willing its occupants to get free, expelling a sigh of relief if the full crew deployed their chutes. When they did not, their fate only served to remind the *Jagdflieger* of his own and his friends' frailty.

Attitudes to the leadership

Mounting losses led some to question what was being achieved by their sacrifice. It was not that they were opposed to the war *per se*, but rather to the way it was being run. It is often claimed that Germany continued to fight beyond 1943 merely to put off the inevitable and, hopefully, to reach a bearable settlement with the Allies; but as Willi Holtfreter points out, 'We all wanted to win the war – not lose it!' The majority of Germans had no clear picture beyond their own small part of the war, but for those flying over the devastated Fatherland, or the endless columns of retreating infantry, it was evident that the war was being run very badly indeed. Most inwardly questioned their

D

JAGDFLUGZEUG-MECHANIKER, 1942

The movement of aircraft, which were designed and developed in temperate European climates, into far-off theatres invariably presented problems for the ground crews.

1. **5./Zerstörergeschwader 1 'Wespengeschwader'; Kotelnikovo, Russia**
'Waffenwarte' synchronize the guns of a Bf109, Stalingrad front. In desert and Arctic conditions, weapons and ammunition had to be kept scrupulously clean and lubricating oils used sparingly; too much simply became a sand-magnet, or froze solid. Inboard guns (mounted above and through the engine) were always more reliable than outboard weapons (in outer-wing sections), which were prone to stoppages through G-force inertia during turns. Centrally-mounted guns produced a concentrated point of impact, requiring careful aim, whereas outboard guns increased the 'spread' of fire, increasing the chances of hitting something.
2. **I./Nachtjagdgeschwader 2; El Qasaba, Egypt, North Africa**
'Motorenschlosser' and aircrew replace a Bf110's portside propeller. In the Western Desert, baking days and rapid cooling by night caused repeated expansion and contraction of metals, seals and hoses. Engines were already hot before start-up and further over-heating often caused component failures in flight. In the Russian winter, ground-crews kept fires burning under the nose to prevent engines from freezing solid overnight. A captured Russian pilot later revealed the Red Air Force's technique of mixing fuel with the engine oil, immediately after shut-down. This preserved the oil's viscosity, but soon evaporated while the engine was pre-warmed the following morning - thus lifting one burden from the permanently overladen *Schwarzenmänner*.
3. **IV./Jagdgeschwader 5 'Eismeergeschwader'; Ørlandet, Norway**
An NCO 'Funkwart' (wireless engineer) retunes radio equipment in an Fw190, via the fuselage access panel, listening for improved reception in his flight helmet earphones. The helmet's shortened communications lead is connected to an extension cable, leading to the cockpit. The high-quality tube and valve technology fared well in extreme conditions, despite constant altitude changes in flight producing harmful condensation and freezing. Signals travelled well across uninterrupted desert and Russian steppe, but suffered in the mountainous Balkan and Mediterranean regions.

Insets

Werkzeugkasten (toolboxes), designed by Albert Witte, Berlin, were often marked to indicate specialist use, such as here for the armourers' section, or for certain aircraft, here for *Klein Flugzeug Mechaniker* (small aircraft), specifically the Fiesler 156 'Storch'. These heavy steel chests incorporated a small-parts tray (sometimes found with dividing walls removed), unlocked by an internal mechanism when the lid was opened. The *Prüfgerät E* (Inspection-equipment E) set contained an assortment of precision tools, including 6x magnifying glass, telescopic inspection mirror, calibrator set, rule and width-gauging spanners. Also included was a *Zylinder-Ausleuchtlampe* (*Stablampe*) cylinder-inspection lamp and two *Suchspiegelgerät* (*Taschenlampe*) flexible inspection-lamps, onto which a selection of small mirrors could be clipped for investigating particularly awkward nooks.



1



2



3



Werkzeugkasten leer
 Bauart jub
 Baumuster KI/Flug-Mech
 Gerät-Nr 40-55A
 Werk-Nr
 Anforderz Fl 68 611
 Hersteller byz



Werkzeugkasten m. Inhalt
 Bauart jub
 Baumuster Prüfgerät E
 Gerät-Nr MG-183
 Anforderz Fl 68 220

Reichsmarschall Hermann Göring visits his units on the Channel Front, summer 1940. At the level of squadron pilots the Luftwaffe commander-in-chief remained popular; a former fighter pilot himself, he had the common touch. Senior combat officers would see through him, though much later in the war; *Oberst* Günther Lützow, the highly decorated former commodore of JG3 'Udet', narrowly avoided court martial in January 1945 when he protested in outspoken terms at Göring's failures of command and slander of his pilots as cowards.



leadership, though such thoughts were seldom voiced openly. Unguarded comment was extremely dangerous; any suggestion of defeatism was officially viewed as seditious, and a wrong word in the wrong company might easily bring a man before a court martial. Even between the closest of friends the wider picture was almost never discussed; Norbert Hannig was shocked into momentary silence when his close friend Helmut Wettstein asked the straightforward question, 'Norbert, when do you think the war will be lost?'

There were rare instances when these small confidences grew into something rather larger and more dangerous. A total of 120 Luftwaffe personnel (of all branches) are known to have deserted, but perhaps the most infamous case in fighter circles was that of O/Ltn Herbert Schmitt and his radar-operator O/Fw Paul Rosenberger of 10./NJG2 on the night of 8/9 May 1943 (their flight engineer, O/Fw Erich Kantwill, was an unwilling accomplice and had to be persuaded at gunpoint. Flying from Aalborg-West, Denmark, they staged a mechanical failure over the North Sea, sending an SOS and jettisoning dinghies for German rescue crews to find, before continuing to eastern Scotland. Intercepted by 165 Squadron Spitfires, Schmitt lowered his wheels, discharged flares and waggled his wings to signal surrender, landing under escort at Dyce airfield. While respecting their convictions, it must be remembered that these men delivered to British intelligence a new Ju88R-1 night-fighter complete with its *Lichtenstein BC FuG 202* model aerial-interception radar, delivered intact to British intelligence. Within weeks, countermeasures were developed and deployed by the RAF, with devastating effects on their former comrades. (Despite his wishes, Schmitt was not permitted to join the RAF, who actually held him in some contempt for his betrayal.)

While frontline personnel were reticent on political matters, among the higher echelons of the fighter arm contempt for the *Reichsmarschall's* incompetence and his failure to support his aircrews was far from unknown; yet surprisingly, Peter Spoden says that Göring remained the most popular of their national leaders. Among the junior ranks the former World War I fighter pilot seemed to be in tune with his airmen; during frequent visits to his combat units he invariably won them over with his bawdy talk and avuncular

style. His notorious accusations of 'Jägerschreck' (fighter-fear) were reserved for his senior commanders and seldom filtered down.

The ground crewman Karl-Heinz Mewes admits that he, like most, concentrated on doing his job as well as he could and keeping out of trouble. Typically, Mewes always had confidence in Luftwaffe high command and trusted their decisions; 'It was only after the war that we discovered the extent of the cock-ups.'

ON CAMPAIGN

Command and logistics

Any frontline Gruppe or *Staffel* could be temporarily reassigned to another *Geschwader*, as demanded by tactical requirements, expediency or simple geographical convenience. Although the attached unit then came under operational command of the new *Geschwader*, its parent command retained responsibility for its logistics – arranging fuel and ordnance deliveries, replacing personnel losses, fulfilling maintenance and spares requirements, as well as organizing pay and victuals for its men. While this arrangement must have seemed like a good idea in peacetime Germany, wartime realities quickly demonstrated its obvious drawbacks. It was scrapped in June 1940 immediately following the French armistice, and thereafter each *Geschwader* assumed full administrative responsibility for all attached units while they were under its command.

Operational airstrips

Unless the unit was fortunate enough to take over an established military or civil airfield, with concrete, block-paved or tarmac runways, the majority had to

April 1943: *Tankwarte* attending to the needs of a Fw190A on the Channel coast. Maintenance crews generally worked in six-man teams – two 'Motorenschlossen' (mechanics), two 'Waffenwarte' (armourers) and two 'Tankwarte' (refuelling technicians) – turning a fighter round between missions in about 20 minutes. On frontline airstrips fighters could be refuelled efficiently by manual vacuum-pumps direct from fuel drums fitted with hard rubber rolling-bands. Long before the outbreak of war Germany faced serious fuel shortages, and her voracious wartime consumption explains – amongst other things – JG4's posting to help defend the strategic Romanian oilfields. Germany's high-pressure coal hydrogenation technology enabled her to produce 600,000 tons of aviation-grade fuel per year from her massive resources of lignite (brown coal), but it was never enough, and in the last year of the war fuel shortages placed serious restraints on Luftwaffe training and operations.



EMERGENCY PROCEDURES

There are four principal ways to land a malfunctioning aircraft. A controlled landing with undercarriage, on unprepared terrain, was generally defined as an *Außenlandung* (outside-landing). If successful, further damage to aircraft and crew was avoided.

1. **I./Nachtjagdgeschwader 4; Florennes-Namur, Belgium**

Damage that denied the pilot control resulted in a *Notlandung* (forced-landing). Willi Holtfreter highlights a frequent mechanical failing: 'I had a number of landings on my stomach in 109s because the wheels didn't come down. Sometimes one wheel came down and the other didn't and then that would normally be a crash-landing.' With luck, or a careful side-slip, the single wheel might be sheared off to reduce the violence of the crash, but generally the pilot had no influence upon the outcome.

Here the crew struggle to wrest control of their Ju88G, their pilot struck in the head by machinegun fire from a Halifax tail-gunner over southern England.

2. **2./Zerstörergeschwader 76; Malackey, Hungary**

Where the ground appeared too rough to attempt a wheels-down landing, or damage prevented landing-gear deployment, the pilot had to effect a *Bauchlandung* (belly-landing). Dropping to low level at reduced power, fuel master-switch and ignition were cut in quick succession. The pilot had to glide in level, as any sinking of the tail potentially allowed it to strike the ground hard and slam the nose down violently.

Crews would rather wrestle a shattered, even burning aircraft back toward their lines than risk crashing in Soviet-held territory, but this Me410 gunner will not abandon his pilot, despite rapidly advancing Red Army infantry.

3. **Stab/Jagdgruppe West; based Biarritz, France**

By far the hardest landing was the *Wasserlandung* (ditching) or '*Wasserung*' (splashdown). If the aircraft could be sufficiently slowed, impact might be lessened, but most would be smashed by the near-instantaneous braking power of water. Brought down over the Bay of Biscay, this staff courier pilot of JGr West managed to exploit the Fi156's extremely low glide rate for a rare successful ditching, though its fixed gear invariably induced a nosedive upon impact. Having deployed his *Einmanns-Rettungsschlauchboot* (one-man dinghy), he has activated the chest-slung *NSG4 Notsende-gerät* (emergency-signalling equipment). Developed in late 1941 by Löwe-Opta, it sent a continuous 0.3 watt VHF signal, with an initial 90-mile range, for up to 3 hours.

The *Ergänzungsgruppen*, originally raised within each *Jagdgeschwader* from 1940, were detached to form autonomous *Ergänzungsjagdgruppen Ost, Sud and West* in early 1942 (renamed *Jagdgruppen* by the end of the year). Finally joined by *Jagdgruppe Nord* in September 1944, all four were amalgamated into *Ergänzungsjagdgeschwader 1* in early-November.

4. **Erprobungskommando 262; based Lechfeld, Germany**

Only when no alternative remained would men resort to *abspringen* (baling out). This was seldom as straightforward as the instructions suggested: jettison canopy, release safety-straps, invert aircraft, drop free. In reality, this was an extremely stressful decision to take, against all natural instinct to stay with the aircraft, even if it was burning or barely controllable. For many, it would be their very first actual jump; training had concentrated upon packing and maintaining the parachute, with much of the rest left to simulation and theory. When this mental boundary was finally crossed, the escape itself could be even more traumatic. On the night of 22/23 August 1943, Lt Peter Spoden (6./NJG5) was badly shot-up by a Stirling tail-gunner over Berlin, shattering his left femur and setting his Bf110 on fire. Eventually managing to extricate himself, he tumbled from the cockpit, only to be slammed and pinned against the tail as his Messerschmitt plunged toward the burning city. (The slipstream was such that it held crewmen against the fuselage and many are known to have impacted the tail after jumping.) After the most terrifying experience of his life, Spoden was only released as the plane entered a gentle roll, but has no recollection of deploying his parachute.



1



4



2



3

K. Kopylov

operate from grass fields or even emergency strips. The grass fields offered benefits and disadvantages – the former, primarily, being that large circular fields always enabled aircraft to land into the wind, the ideal approach. Although the earth gave softer initial contact on landing, unless the strip was perfectly flattened the run-out could be a little bumpy, putting some stress upon landing gear and airframe. Airfield maintenance personnel, assisted by any temporarily unoccupied mechanics, were constantly employed in the upkeep of the runway, flattening out all imperfections and gouges with giant rollers dragged behind tractors.

Autumn rains and spring thaw, coupled with incessant traffic, quickly reduced grass strips to unsafe quagmires. Several reserve fields were typically earmarked for brief and rotated use in such conditions so as to ease the burden on the primary base. Wherever practical, units were transferred to paved fields during these periods, but hard strips were at a premium and often had to be shared.

The first snowfalls on a grass field were left untouched, to melt away; heavier falls were rolled and compacted, but had to be shovelled clear of paved strips, with sand or grit liberally applied to prevent icing. Uneven gritting could cause serious landing difficulties, as patches of reforming ice were extremely hazardous to heavily-braking aircraft.

Arctic conditions experienced in occupied Scandinavian countries and northern Russia posed further problems of airstrip recognition from the air. A pilot entering his final approach often needed assistance from ground-controllers who had a slightly better view of his line into the ‘cleared’ path, cut through deeply piled snow and marked with improvised flags or even tree branches. Untrained for blind flight, single-engine pilots had much greater problems in extreme conditions than night-fighter pilots, who could perform instrument landings with comparative ease.

A pilot – believed to be from II./JG26 ‘Schlageter’ on the Channel coast, 1943 – snatches a rest in full flight gear beside his Fw190A-6. In the cockpit the tireless ‘Schwarze’ continues his checks; he may be the *Staffel* instrument mechanic – *Feinmechaniker*. In the background is the protective wooden splinter pen for another aircraft, with a heavy beam framework to support camouflage netting. (Mark Taylor)



At the other extreme, the loose, fine dust of the central Ukrainian plains and North African desert presented some obvious problems with visibility, but many African regions had rocky terrain which had to be broken, cleared and flattened by *Luftwaffen-Pionier-Bataillone*. By far the greatest concern was constant and unavoidable penetration by sand, causing severe wear to engine components and clogging weapons and mechanical systems. 'Tropicalized' versions of aircraft types, with extra filters and covers, went some way to protecting them, but service in these regions remained equally punishing to man and machine.

Improvised airstrips were a necessary evil, only employed where no alternative was available. When tactical demands forced squadrons to operate from the exceptionally poor terrain encountered in undeveloped regions or those with a high water-table, the *Bau-Kompanien* (construction companies) were called upon to perform miracles of engineering. The surfaces they carved out were metalled with compacted gravel (extremely damaging to air intakes and prop-blades), open-mesh steel matting or interlocked wooden beams. In heavily forested areas clearings had first to be cut; the felled trees providing material for crude log causeways – particularly abusive to undercarriages. The infamously narrow track of the Bf109 was particularly susceptible to any unevenness or rutting, which caused frequent 'ground-loops' or jarred the machine onto its nose or back, but the beefy Fw190 took most surfaces in its stride. The same was not always true of the pilots. Men who had spent many years flying from grass or near-desert strips on the Eastern Front found it difficult to readjust to the concrete runways of some western bases when reassigned to *Reichsverteidigung* (home defence) operations from late 1944, and some particularly rough landings resulted in seriously damaged or even written-off aircraft. (The closing months of war found several units operating from sections of German *autobahn*.)



Ground crewmen servicing a Bf109E in France, 1940, are temporarily distracted by the 'Staffelhund'; one mechanic, still absorbed in his work, wears *Gummiuberschuhe* rubber boots to protect the airframe. About half of a *Staffel's* total inventory of 12–15 aircraft (including reserves) were operational at any one time. Apart from necessary repairs, each received a major service every month; good stocks of spare parts were maintained, and special factory deliveries could usually be made (to European airfields) in 48 hours.

Accommodation

On the more isolated central Russian airfields frontline airmen invariably had to make do with tented shelter. Tents were generally erected over neatly excavated pits, which provided some protection from summer heat and winter winds and further served as individual shell-scrapes in the case of Soviet night-harassment raids. Modest billeting might be possible in nearby peasant villages. The primitive cottages – often shared by their owners with livestock in winter – were heated by a large clay oven, and the compacted earth floor was covered with straw; these basically medieval dwellings were something of a culture-shock to the modern German. In larger towns *Luftwaffe* men were lodged in comfortable houses alongside the families, sleeping on couches or mattresses on the floor while the owners retained their beds. Considering the circumstances, most Russian homeowners were

surprisingly cordial and accommodating, the airmen often bringing them gifts of rations in return. A great many men picked up a few words of Russian and attempted to converse with their hosts; strangely, a remarkable number of isolated villagers already had a smattering of German.

Due to the limited and transient nature of Red Air Force night operations, NJG6 developed several autonomous mobile units, operating directly from – and housed within – a commandeered train. These ‘*Verdunkelte Züge*’ (dark night-trains) enabled a *Staffel* to relocate with relative ease and great speed, restricted only by the railway network and presence of suitable airfields (both quite abundant in Russia). The 18-carriage trains were well-equipped, housing a command office and radar station, generator cars and self-contained machine-shops. The 75-man crews were provided with comfortable berths, washrooms and dining cars with lounge (occasionally even a bar), and a galley supported by dry-ration stores and livestock wagons. The whole thing could be ready to move within two hours.

Diet

After the ‘*Schwarzemanner*’ (‘black men’ – the mechanics), catering staff were among the hardest-working personnel on any airbase. Constantly searching for ways to supplement and vary the menus they could offer, the cooks often struggled to provide a calorific diet. Besides the official quota of dried and canned meats, vegetables, fruits and powdered potatoes, it was sometimes possible to obtain local produce at unit expense, often traded for alcohol and tobacco. Where no fresh food was to be found, all the cooks could do was lace their concoctions with vitamin powders. Although it might be possible to shoot some wildlife for the pot, usually the best they could do was trade rations with any nearby Axis allies. Food might be washed down with *Ersatzkaffe*, processed from barley – the taste of which Norbert Hannig describes as ‘indescribable’.

The cooks prepared breakfasts, lunches and dinners at all hours, generally providing coffee before each mission and a hot meal upon return. While some intruder men chose to take snacks with them on their longer missions, no special in-flight rations were provided, so kitchen staff instead prepared sandwiches upon request. It is often claimed that night-fighter crews received a special diet to enhance their night-vision, but this was merely ‘advised’, leaving the individual to fill his plate accordingly. *Hauptmann* Peter Spoden recalls that ‘the doctors told us to eat many carrots [for the] vitamin-A, and so a few of us did. The ability to see at night was a factor we liked to improve by vitamin-rich fruit and vegetables.’ It took a surprisingly long time for the importance of individual night-vision to be acknowledged; ‘it’s a funny thing that nobody was checked before, when joining the *Nachtjagd*. Later on, in 1943, doctors checked us.’ Not surprisingly, ‘they found out the pilots with the best night-sight had the most successes. I think the same was true in the RAF; the man who sees first, shoots first.’ Spoden adds, ‘some rear-gunners did not recognize us [as enemy aircraft].’

Morale

While a mundane diet was simply tedious, lack of mail from home was a constant and powerful demoralizer, particularly for those with family in the target areas of RAF and USAAF bomber raids; latterly, the knowledge that the Red Army was advancing into Germany’s eastern provinces drove men from those regions close to despair.

The first loss of a friend was a hard introduction to the reality of frontline life, but it was certain that he would not be the last: 'When a comrade didn't come back, you just had to get on with it and put them out of your mind'; typically, Wilhelm Holtfreter had to put a lot of young friends out of his mind. 'We never lost our sense of humour, even though we had many losses. In one action, we lost nine machines. At the barracks in the evening we'd talk and tell stories, have a little drink. The camaraderie was good.' This emotional defence mechanism is, perhaps, best explained by Norbert Hannig: 'Whenever one received news of a comrade's death, something remarkable happened. All normal feelings seemed somehow to switch themselves off. The mind imposed iron control on the body.'

In spite of countless painful experiences, few pilots regret today the choice they made when they entered the Luftwaffe recruiting station all those years ago. They are constantly reminded of their own fortune and the great privileges they enjoyed. Recalling flying an Fw190 over Italy in 1944, Willi Holtfreter eloquently illustrates this: 'I remember getting to a certain height and being able to see the Adriatic on one side and the Mediterranean on the other. To be that high, it was a whole different feeling.'

BATTLE

Preparation

Upon arriving at dispersal, the *Staffel's* 12 pilots (if at full strength) were detailed into three *Schwarme*, each comprising two *Rotten* – the *Rotte* was the basic fighter 'pair' of leader and wingman. Each was then assigned to his aircraft for that day. Ground crews adjusted seat positions and rudder pedals to suit; the older, established men of the squadron had their own regular planes, permanently tailored for them. An *Alarmrotte* lined up at the foot of the runway every morning, in case of an *Alarmstart* (emergency scramble), signalled by a green *Pfeifpatrone* (whistle-flare). Then, everybody simply waited.



Channel coast, 1940: a typical group of pilots awaiting orders. The seat used by the *Feldwebel* (centre) has apparently been salvaged from a scrapped aircraft. The unacceptable losses of Bf109s over England led to a major tactical change, with *Jagdwaaffe* pilots instructed to strike hard, cause as much damage as possible as quickly as possible, and then extricate themselves and race home at low altitude, avoiding protracted engagements.



Théville, France, June 1942: a *Schwarm* of Fw190As from 7./JG2 get the signal for an 'alarm start'. A ground crewman (right background) is clearing an *Anlasswagen* (starter-trolley) out of the way. These two-stroke engines on two-wheeled carriages were used to recharge and jump-start fighters via their external power sockets, and also to supply any required power for an aircraft's systems at all times when it was on the ground, so as to save the fighter's own batteries.

June 1941: armourers reload the wing-mounted 7.92mm MG17 machine guns of a Bf109 – the dark head of a tracer can just be seen as every sixth round. The whole 420-round belt could be used up in 30 seconds' firing, thus restricting pilots to short, controlled bursts. Sudden overheating, caused by firing in extreme cold conditions in winter or at high altitude, could result in a burst barrel ('*Banane*'); prolonged overheating might cause even more serious damage if a round 'cooked off' as it was chambered.

'We almost always played a card game called *Doppelkopf* in the dispersal tents, or we lay in deckchairs and dozed,' Willi Holtfreter remembers of waiting in Tuscany with 9./JG53 to patrol over Monte Cassino. 'If it was "sitting-preparation", that meant you already had your helmet and parachute on, sitting in the tent.' The interminable wait was among the most stressful times, allowing men to dwell upon coming dangers; 'our hearts would beat faster when the telephone rang. I personally never smoked, but some of the others smoked an awful lot.'



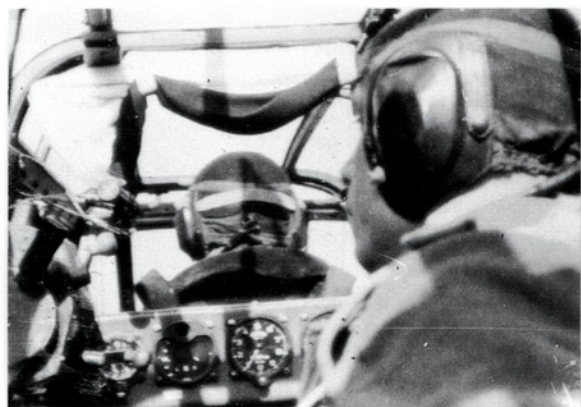
Take-off

Slamming down the receiver, the operations staff NCO calls from his hut 'Achtung! Alle Jäger in Sektor Bruno-Emil; Feindliche Bomber in Höhe 9,000 Fuß!' ('All fighters to Sector Bruno-Emil – enemy bombers at 9,000 feet!'). Designated patrol areas were subdivided into alphabetically-coded sectors to make precise vectoring straightforward; these 'Tarntafeln' (camouflage tables) were used for radio communications and changed every few weeks. Almost anything could be used for the sub-unit or individual callsigns, with two-syllable words preferred; thus, it was possible to hear 'Bratwurst ruft Kohlkopf' ('Sausage calling Cabbage'). Airmen often used permanent callsigns.

The pilots heave themselves up and run toward their machines. Engines are already turning: 'The technicians were always there, ready by your plane; they operated the starter-motor with a mobile battery.' In no time, the quiet field explodes into urgent activity. Engines roar as radio checks are run in turn: 'Hannah 2 von 1, Frage – Viktor?' ('Question – understood?'), to be answered, 'Viktor, Viktor' ('understood') or 'Negativ'. An aircraft with faulty communications was a liability, and was quickly ushered from the circuit. Taxiing to the runway in their pairs, the pilots make a final radio check, and the leader gives the nod. The throttle is eased forward, right foot covering the brake, and each pair commences its take-off run. As speed builds the Messerschmitt, like the Ju88, has a nasty tendency to tail-swing; a little throttle, hard right-rudder and right wheel-brake was sufficient to correct her. With everyone on the field watching, the wingman is determined to let her rise in perfect unison with his leader. As they enter a steep climb, wheels are raised almost immediately. The *Staffel* climbs to 1,000 metres (3,000 feet), and opens up into combat formation. Arming-switches are flicked and the servos charge weapons with an audible click, tripping the cockpit indicator-bars to white. Prevailing conditions strongly influenced the formation; in Italy, 'Mostly we flew in fours, never in pairs – it was too dangerous to do that. We flew about 30m apart.'



A Bf110 pilot is helped with his somewhat over-engineered cockpit canopy by his back-seat man. The 57mm armour-glass windscreen reinforcement impaired the vision, but was welcome. The *Bordfunker* wears the *Fallschirmgurt 30-II-24* chest parachute harness, not normally associated with fighter crews; it allowed him to move unhindered between his radio and his gun, and the canopy pack could (in theory) be clipped to the quick-attachment hooks immediately before baling out.



In addition to his radio equipment the *Zerstörer-Bordfunke* had a small instrument array, for accurate navigation and flight record-keeping. The small handle (left) operated the 20- or 30m-long trailing radio aerial; Bf110 pilot Peter Spoden recalls that these were often lost, due to radio-operators forgetting to reel them in before landings. The apparent absence of life-preservers suggests that this crew is flying over the Eastern or North African fronts.

Bomber-escort

The commanders of bomber *Kampfgeschwadern* had watched waves of their aircraft head proudly out across the Channel in 1940, only to witness the tattered remnants limping back in disarray. From north-west European bases, raids to Liverpool lasted almost 4½ hours and to Glasgow about 6 hours; without effective fighter escort, few succeeded in reaching their targets unmolested, and the formations were quickly torn apart. Although Luftwaffe fighters had employed fixed auxiliary fuel tanks in the Spanish Civil War, these were in curiously short supply by the early *Blitzkrieg* invasions. Such fixtures would have been nothing

but a fatal encumbrance in any engagement with the fast RAF fighters, so endurance was sacrificed for speed and agility.

Had disposable 'drop-tanks' been widely available, the fighters, and thus the bomber force, would have enjoyed more equal terms in the early Channel battles. (The parsimonious Luftwaffe considered drop-tanks to be extremely wasteful; an order by Göring in October 1943 stated that tanks could only be dropped in the most dire circumstances, not simply because they were empty.) Instead, the inevitably high bomber losses drove Göring to demand ever-tighter escorts from his fighters – a policy despised by the pilots, who protested that it placed such limits upon the fighter's potential that it became just as vulnerable as the bomber, thereby negating any defensive value. They argued that the fighters must fly high and separate cover, in order to pounce on and break up attackers before they even reached the bombers. The fighter is, by its nature, an offensive weapon, and at its best when allowed to use all of its speed and the whole sky; forced to stay close to the bombers, it would merely become a victim too.

Close escort for Stuka dive-bombers was among the *Jagdfliegern*' most hated duties; weaving above the murderously slow Ju87s, the fighters themselves were virtually sitting ducks, and many were simply picked off before they could accelerate to effective combat speed. In Günther Rall's opinion, for all the losses incurred, 'they might just as well have set our fighters on fire on the ground'. While several *Jagdflieger* did achieve successes in the purely tactical pursuit of enemy fighters during escort missions, such victories were of limited strategic value – especially if the fighter's absence exposed the bombers to attack from other quarters.

The *Direkt-Eskorte* demanded that the fighters held station no further than 100m from their charges, merely 'swatting' the enemy away and returning immediately to close any gaps in their cover. *Indirekt-Eskorte* permitted movement up to 500m from the bombers; this granted more freedom, but potentially enabled break-throughs when individuals were

¹The dilemma of close escort could be solved, as proven by the USAAF's all-black 332nd Fighter Group, which flew strictly protective cover from mid-1944, defending their charges at very close quarters and stubbornly refusing to be drawn away into protracted dogfights. The 'Tuskegee airmen' achieved one of the best escort records of the war, losing only some 25 bombers to enemy fighters; but consequently, their squadrons could boast relatively few aerial victories. Maximum strategic effect was ensured for the bombers, at the cost of short-term tactical successes for the fighters. It is not inconceivable that this trade-off between protecting bombers and scoring 'kills' had some bearing on the more fame-hungry *Jagdfliegern*' opposition to the policy.



A Bf110 operator/gunner preparing his single MG15 for action; ten 75-round double-drum magazines were carried. Rear armament was progressively improved to twin MGs, but was never adequate.

drawn off by probing attacks. The greatly reduced bomber formations flown from late 1941 enabled the numerically-stretched fighters to provide more effective combinations of both elements.¹

Destroyers

The long-range *Zerstörer* was not intended as a bomber-escort, in the conventional sense. The Luftwaffe was well aware of the fundamental flaw in the long-range fighter concept; for a fighter to reach a distant target it had to be big enough to carry sufficient fuel, and needed two engines to do so. But this made it too heavy and unwieldy when it had to fight; locally-based, single-engined interceptors would always have the advantage. The planned task, therefore, was not to escort the bombers but rather to precede them, tying up and exhausting enemy fighters and allowing the bombers to follow unmolested. The concept worked well in the *Blitzkrieg* on Poland, Holland, Belgium, France and even Russia, where surprise was key and raids largely uncontested; but the slower-turning and under-gunned Bf110 proved unacceptably vulnerable to the swarms of Hurricanes and Spitfires over England, where it really needed a long-range escort itself. The destroyer concept was of severely limited application; but although the otherwise excellent Bf110 was withdrawn from the Channel battle after very heavy losses (and has been unjustly maligned ever since), it was in fact no sitting duck and accounted for a frequently overlooked number of British fighters.

Many destroyer units were reassigned en masse as night-fighters, for which the

The pilot of a Bf110 night-fighter. When it was introduced in early 1942 the *Lichtenstein* airborne radar equipment got a mixed reception, since its weight imposed a 25mph speed penalty, and early models naturally suffered from frequent failures. Shortages meant that as late as 1943 almost 20 per cent of the *Nachtjagd* crews still had to rely on ground-radar control, the *Revi 16B* gunsight and the naked eye.

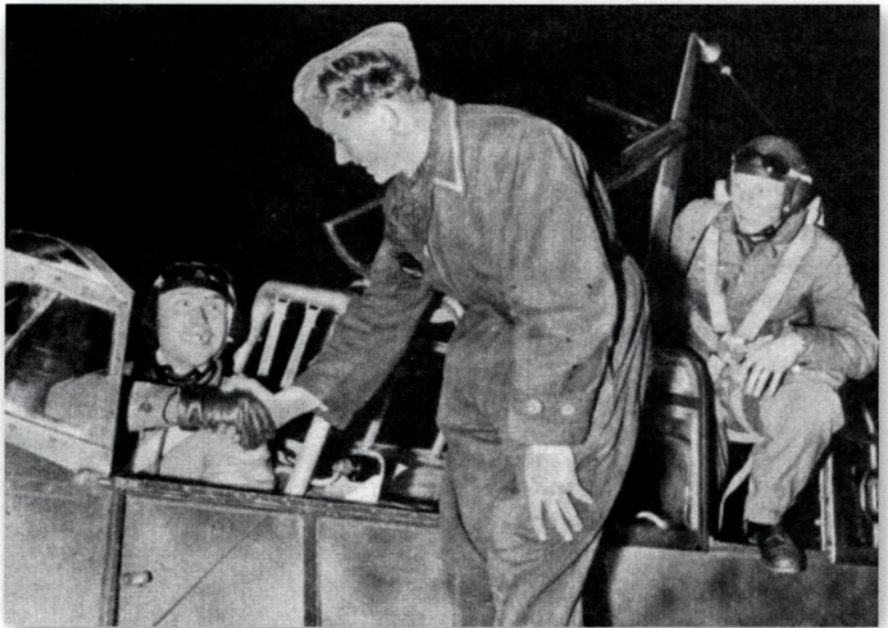


need would grow ever more urgent. Although out of favour in the West, the *Zerstörerwaffe* found a new lease of life in the Mediterranean and Aegean campaigns, where the under-equipped Desert Air Force was hard-pushed to swamp them as RAF home forces had been able to do. There Bf110s proved versatile long-range fighters and convoy-escorts, just as they did over the North Sea. The destroyer squadrons were primarily (and very effectively) engaged in anti-shipping missions, and ground-attacks against airfields, vehicles, artillery and troop emplacements.

Their skills and nerves were further stretched on the Russian and Balkan fronts, where they increasingly took on ground-attack roles as tactical-level bombers; as high-speed *Schnellkampfbomber* (with *Geschwadern* temporarily redesignated as SKG); and even as dive-bombers, concentrating on vital road and rail junctions. At one stage the ubiquitous Bf110 was slung with massive 1,000kg bombs for 70° *Stuka* attacks on Stalingrad – a task as hazardous to the crews as to their targets. A more suitable employment was as a tank-destroyer, shattering Russian armoured columns with ventral 37mm *Flak-kanone* and 250kg bombs. The ever-growing threat of partisan activity in German-occupied rear areas saw Bf110s flying many patrol and interdiction missions in support of security operations; to bale out or crash-land – especially over the Balkans – might bring a terrible death at the hands of these brutalized enemies.

Later recalled to the West as *Pulkzerstörer* ('formation-destroyers'), to break up the B-17 and B-24 'boxes' for the Fw190s and Bf109s, the Bf110s used both underslung 37mm cannon and 210mm rocket-launchers suspended from their wings. They could be devastatingly effective from well outside the bombers' defensive range, provided that the American escorts could be kept away. However, few rockets were available, and those that did arrive were prone to misfire. Reassigned to this role from night-fighting in January 1944, Peter Spoden led a *Schwarm* of rocket-equipped Bf110s into action, only to discover that not one of them would fire. Even when they did, massed prop-wash and turbulence in the middle of the box often caused instability; B-17 flight engineer Sgt John Comer (533rd BS, 381st BG) was once entranced by

A gleeful *Nachtjagd* crew are greeted by their *Unteroffizier* mechanic. Once ground-radar controllers vectored a fighter towards the bomber stream, the on-board radar operator could pick up a contact some two miles away and fine-tune the interception, which finally came down to the pilot's night vision. The *Bordfunker's* effectiveness as a defensive gunner was ruined by staring at the glowing radar screen; eventually a third crewman – often recruited from ground crew volunteers – was crammed in to man the guns and allow the operator to concentrate on his radio and radar equipment.



a strange object, 'spinning like a huge disc', hovering just 10 feet off his starboard wing. Their instability didn't stop them from detonating, however.

Night-fighters

In the early daylight raids over Germany, with only partial (if any) fighter cover, the RAF had suffered terribly at the hands of the Luftwaffe. Casualties inflicted by fighters and Flak were so crippling that the British were soon forced over to night operations, buying much-needed concealment at the cost of greatly reducing their already marginal accuracy. However, the switch from 'point' to 'area bombing' from March 1941 negated the need for much precision.

Although both sides had experimented with a night-defence force, neither had made any serious progress, instead relying on anti-aircraft artillery. Early Luftwaffe efforts at night interception were extremely scrappy and frightening for all involved. Initially they simply attempted to flood the skies over the targets with as many searchlights as could be mustered, while regular fighters, from hastily-raised *Nacht-Staffeln* within the *Jagdgeschwadern*, tried to line up on bombers temporarily caught in the glare.

Since the local Flak batteries naturally did not cease fire, the Bf109s were routinely buffeted by nearby shockwaves, the blast from the heavy 8.8cm sometimes jolting engines to a stall. Attempts to co-ordinate the three elements proved frustrating, with the fighter pilots frequently drifting into the Flak gunners' sights. Their rudimentary instrument-flying and navigation skills made any night mission perilous, whether or not it involved combat.

Persistent experimentation with ground-radar control of aircraft and searchlights proved the viability of the *Hellenachtjagd* (bright night-fighting) or *Henaja* system, and the experimental specialist *Nachtjagdgeschwadern* began formation from mid-1940. Within two years the night-fighting arm had evolved into the most technologically advanced sphere of aerial combat, and its crews into the most highly trained and skilled.

Night interception techniques fell into two distinct elements, aptly named 'Zähme-Sau' and 'Wilde-Sau' ('Tame Boar' and 'Wild Boar'). When incoming raiders were detected by ground radar stations, the 'tame' Bf110 and Ju88 heavy fighters were despatched to wait above designated sectors, there to be vectored into the bomber stream as it approached. Precise location of individual targets was then the work of the aircraft's wireless operator and the pilot's naked eye. The fighters went up in turn, relieving each other as fuel ran low, to maintain a constant presence over their assigned area. The most experienced crews invariably went up first, and thus tended to see the most action; the junior crews sat and waited in their cockpits, in *Sitzbereitschaft* (seat-readiness), often until they were finally stood-down at dawn.



Before a routine mid-war patrol the *Leutnant* pilot of a Bf109 is helped into his parachute harness; the confined cockpit of the Bf109 required the use of a seat-pack, but the roomier Fw190 could accommodate the more comfortable *Rückenfallschirm* backpack, which also gave smoother opening. The ground crewman with the starter-crank wears ankle boots with the sole-studs and the entire heels removed, to protect the aircraft.

The 'wild' Bf109s and Fw190s, circling high above, also relied upon purely visual recognition. Against the sweeping searchlights, enemy marker-flares and even burning cities below them, the heavy bombers could be readily picked out. On particularly overcast nights the searchlights were simply fixed across the cloud-base, creating a glowing cushion against which the bombers stood out in sharp silhouette. On cloudless, moonlit nights the RAF usually suspended its operations – under such conditions the *Nachtjäger* could literally see them a mile away.

An important new capability was added from February 1942 with the fitting of the first airborne radar sets to Bf110s, which thereafter put the 'Wild Boars' out of business for about a year. Although primitive by today's



4./NACHTJAGDGESCHWADER 1; VENLO, HOLLAND, 1941

Instructors discuss tactics with experienced day-fighter pilots undergoing conversion to night-fighters. A model Halifax bomber fitted with wire cones (representing defensive arcs of fire) is used to demonstrate the safest approach. At this time, NJG1 served as an operational evaluation unit, experimenting with various aircraft types and techniques in the still-rudimentary art of night-fighting. In late September 1940, I./NJG2 had learned to home in on radio signals emanating from RAF bases. Lurking nearby, the long-range Ju88 and Do17 night-intruders struck the bombers at their most vulnerable, as they took off. Alternatively, they latched onto the returning streams, pouncing as they landed. These most effective techniques were stopped by the *Führer*, however, as the results could not be witnessed by German civilians!

Improperly dressed (without a belt), the *Major* wears privately-tailored *Fliegerhose*, with integral mica-windowed map-pocket; using chinagraph pencils, locations and notes could be recorded on the map without actually defacing it. While most air forces struggled with clumsy, thigh- or even wrist-mounted map-boards during the 1930s, this practice enjoyed early favour in the Luftwaffe (albeit unofficially).¹

Inspired by a World War I tradition, his lovingly-carved '*Abschuß-Stock*' (victory stick) commemorates foreign service and aerial victories. Far from standard, these 'awards' were generally made by ground crewmen for their most respected comrades and, as such, were proudly treasured. Recipients were seldom without them on base (although such affectations were strictly prohibited in public).² The *Unteroffizier* (right) wears a *Fliegerjacke So/40* over his zip-fronted sports jersey (of approved design, purchased from Luftwaffe clothing outlets).

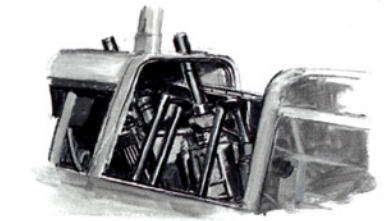
Insets

Bottom: The 'Pursuit Curve', when viewed from above shows its 'real motion', while the same approach viewed from a B-17 top-turret position illustrates the 'perceived motion'. In the complex art of deflection-shooting, 'lead' is not always given ahead of the target. The gunner's ring-sight is here aimed directly *away from* the travel of the enemy fighter, the forward motion of the bomber drawing his fire onto that aircraft. As the US Army's manual on 'Flexible Gunnery' of May 1944 succinctly warns, 'Believe it or not, your bullets do not go where you point them.'

Top Right: Late-1941 trials of appropriately named '*Spanner-Anlage*' ('peeping Tom' installation) infra-red sensors in the noses of Bf110 night-fighters gave limited success, until replaced by advanced *Lichtenstein* intercept-radar, with its distinctive antenna-arrays. The rear cockpit section is fitted with twin-mounted 20mm MG151 machineguns. Designed by *Hauptmann* Rudolf Schönert and *Oberfeldwebel* Paul Mahle of II./NJG5, the devastating '*Schrägemusik*' system enabled attack in an RAF bomber's blind spot (the majority of them had no ventral defences), from 30–50 metres below. It was almost a year before Bomber Command accepted its crews' many reports of mysterious, vertical gunfire, but it was still no easy task for the *Nachtjäger*. On 4 December 1944, NJG6 *Leutnant* Peter Spoden employed his *Schrägemusik* to bring down three Lancaster bombers in just 9 minutes. Under heavy fire for much of the time, 'I was completely exhausted, soaked through with sweat and trembling with my entire body.'

¹ The innovation was curiously short-lived, however, perhaps due to procurement difficulties, but has since become standard on most current flight suits.

² The Army later adopted the similar 'Wolchowstock', named for the campaign in the Volkhov region of Russia.





Triqueville, France, May 1943: beside 'Black 1', the Fw190A-4 of the *Staffelkapitän* Oberleutnant Horst Hannig, tired pilots of 2./JG2 discuss the coming mission. Under magnification four of them can be seen to have *Farbbeutel* dye-marker packs attached to their *Schwimmwesten*, and the wrist-compass was routinely carried secured to its oral inflation tube. The striking 'Eagle' decoration on the fighter is an extension of the black patch usually painted on the Fw190 to hide oil and exhaust staining.

standards, and difficult for the wireless operators to master, these sets freed the *Nachtjäger* from the apron-strings of ground control and transformed the night war over Germany. The initial *Lichtenstein BC* set was soon updated to the more sophisticated *FuG 202*, and a technical competition between improved British and German technologies lasted for the rest of the war. Another innovation of 1942 was the augmentation of nose-mounted guns with upwards firing 20mm cannon in dorsal '*Schrägemusik*' mountings.

From the end of 1942 RAF Pathfinder crews would penetrate German airspace far ahead of the '*Möbelwagen*' ('furniture vans' – big planes). These picked navigators and master-bombers sought to illuminate the target with flares, incendiaries and some high-explosive bombs; the following waves simply had to pour their loads into the fire. The real prize for a night-fighter was to find and kill this '*Zeremonienmeister*' ('master of ceremonies'), thus severely hampering the entire mission.

The prospect of closing tightly on a black shadow in the dark sky was unnerving; collision was a constant danger and a not-uncommon occurrence. Drawing ever closer, the pilot had to manoeuvre smoothly into his optimum attack position, generally directly below the tail. At any moment the blackness could be ripped apart by a burst of fire from the quadruple tail guns just yards away from him. A bold RAF tail-gunner might let him approach, waiting to fire a 'lightning bomb' at his pursuer – a flash-powder charge designed to dazzle the approaching night-fighter and destroy his night-vision – before letting fly with a hail of well-aimed .303in MG-fire. Often derided for their poor armament, the British bombers in fact proved their capability in knocking night-fighters out of the sky (though never often enough to seriously reduce the very high casualty rate among bomber crews). If the *Nachtjäger* could slide in close unseen, his combined battery of 7.92mm

machine guns and heavy 20mm and 30mm cannon had a devastating effect upon the thin structure of the British machines. Slamming into the wing-root at close range, his shells would quickly bring flames erupting to engulf the stricken machine, or would simply smash its skeleton to pieces.

Screwing his eyes shut in an effort to preserve his night-vision, the attacker heaved his craft out of the way of the falling giant; some failed, and were destroyed by their own victims. Many had no choice but to fly right through the burning wreckage, badly damaging or setting fire to their own machines. The *Nachtjagd* also suffered from a whole new dimension of danger following the appearance of RAF Beaufighter and later Mosquito night intruders from mid-1943. As the air war turned ever more decisively against Germany, even the night-fighter arm was increasingly pressed into daytime defence against US bombers. Encumbered by their heavy radar equipment, the Bf110s were terribly vulnerable to escort fighters, and in this role they suffered shocking losses.

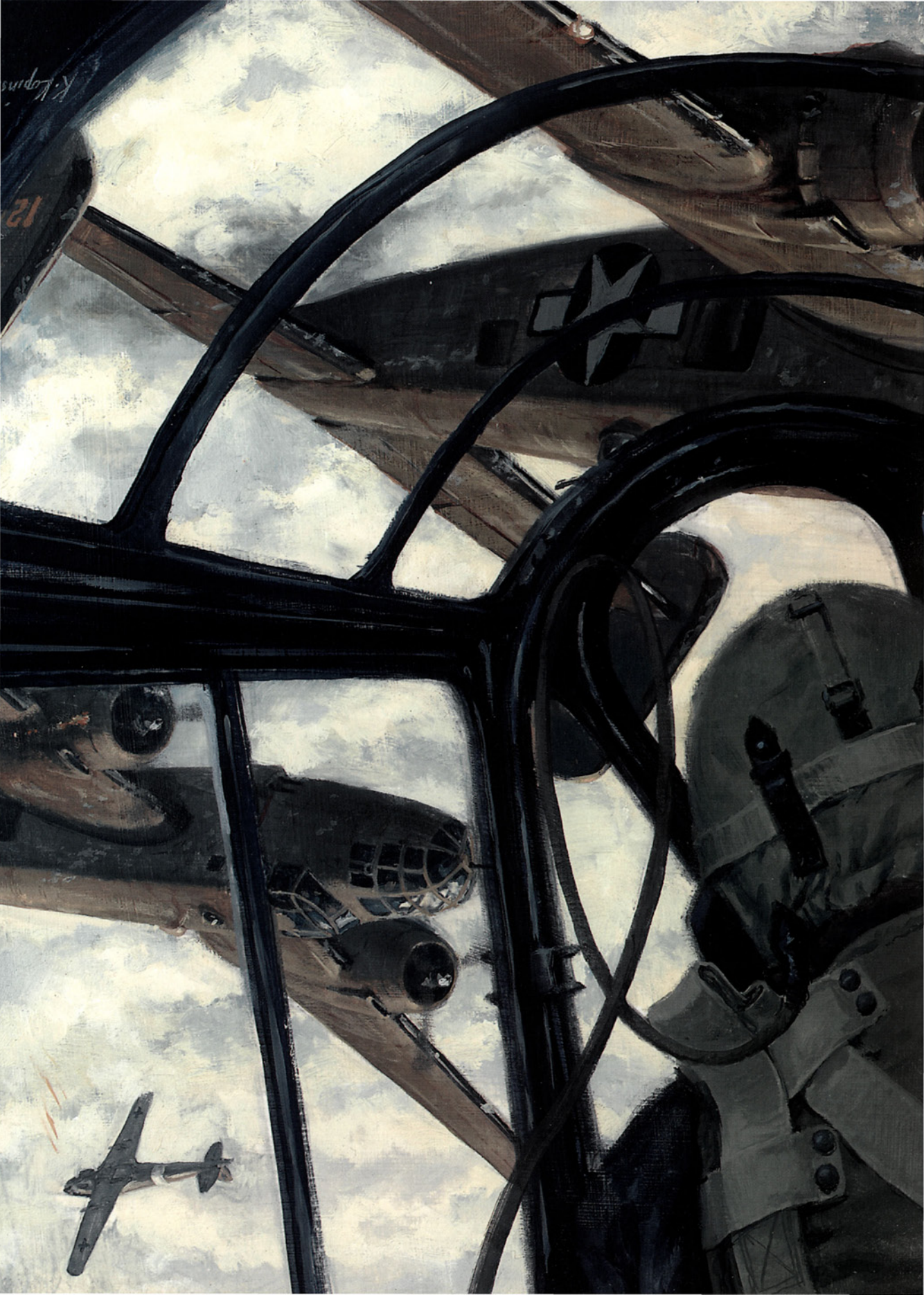
The limited nocturnal operations mounted by the Red Air Force did not demand a heavy presence in the East, where only one *Nachtjagdgeschwader* (NJG6) and two single Gruppen (NJG100 and 200) operated, compared to five NJGs in the West.

Day-bomber interception

Learning the same hard lessons as the RAF, the USAAF nevertheless chose to stick to daylight bomber operations; the much vaunted (and somewhat overstated) accuracy of its Norden M-series bombsight would be squandered if forced to follow the British into the night. Initially cursed by the same lack of long-range fighter cover as the RAF, American crews would suffer terribly for this choice; but the arrival of disposable auxiliary fuel tanks in late 1943, coupled with the appearance of the superb P-51D Mustang, allowed bombers to be escorted throughout their missions deep into the heart of Germany.

The venerable Bf109 soldiered on until the end, with improved weapons combinations and upgraded engines. The *Irma-Behalter* 300-litre fixed external fuel tank added a valuable 125–200 miles to the range, but the Luftwaffe could never afford disposable 'drop-tanks'. Here a Bf109G 'Gustav' is pushed back into a concealed dispersal under cover of woodland as soon as it has returned from a sortie – a vital precaution under skies ruled by USAAF and RAF fighters. Following the Allied landings in France in summer 1944 the whole mood of the Luftwaffe changed. Propaganda and censorship had ensured that few pilots knew anything about the war situation beyond their immediate environment; but the expanding Allied foothold in France, bringing Allied fighters to their own frontline airstrips to confront the outnumbered *Jagdflieger*, could not be hidden.







II./JAGDGESCHWADER 77; BASED LONATTE-POZZOLO, ITALY, 1943

Between April and November, II./JG77 uniquely employed the Italian Macchi C205v, while awaiting delivery of replacement Bf109s. Here one executes an inverted beam-attack against a flight of Mitchell B-25 medium bombers. This kind of attack was favoured for its fast exit; a sharp pull back on the stick threw the aircraft into a vertical nosedive. Also wearing an Italian SAFAR 8120 flight helmet, the pilot instinctively (and involuntarily) crouches forward in the attack, making himself as small a target as possible. Some pilots were able to calculate complex, long-range deflection-shots, placing their gunfire directly into their opponent's path. Others exercised no such finesse, closing to as little as 15 metres before hammering a short but devastating burst of cannon-fire into the enemy machine. Although usually successful, great nerve was required, as pilots risked damage from flying debris, explosion or burning fuel. At these ranges, precision gun-sights were rendered utterly superfluous and sometimes considered a nuisance. Becoming operational in mid-1943, the superb C205 'Veltro' (Greyhound) proved equal to the American P-51, impressing II.Gruppe sufficiently to retain them alongside their new '109s.

The *Jagdflieger's* primary goal was to strip away the escorts as soon as possible, drawing them into the fight. Initial contact forced the American P-47s and P-51s to jettison their range-extending 'Tokyo-tanks' immediately if they were to stand anything like an even chance in the mêlée. Their endurance instantly cut, the fighters would thus be forced to make for home early, abandoning the bombers to fend for themselves later in the mission.

Attacks against bombers took two basic forms. The first of these, the 'Fly-Through', was as simple as it sounds: the fighter flew an essentially straight line toward the bomber formation, pouring as much cannon-fire as possible into a point ahead of his selected target, into which the bomber would fly – a simple deflection shot. This form of attack might be commenced at right angles to the bomber, from any elevation, but was most often presented directly from the front, concentrating fire upon the pilots and control deck. A side-on or rearward approach would give him the most time – but that extra time was shared by the American air-gunners. Whichever direction was taken, the fly-through attack meant that a pilot's aim was good for only a fraction of a second, much of his fire going wide. The fighter would attempt to align as many bombers into his direct line of sight as possible, often closing to a few hundred yards before opening fire on his selected victim. If apparently sufficient strikes were seen to register upon his primary target, a slight flick of the stick or pressure on the rudder pedals might slip the guns just enough to pick up a second and, perhaps, even a third target beyond it, before he flashed right across the top of the box formation only a moment later. Catching these other targets demanded great skills in the complex art of deflection shooting, as the precise degree of deflection required altered rapidly (and in many different ways) with his approach rate, and the varying ranges, courses and speeds of the individual targets. For the most part, causing sufficient damage to just one machine was a great achievement, and even that was primarily down to luck. In a head-on approach at 375mph, a fighter would pass over a 300-yard-deep box in less than two seconds, since the converse heading of the 300mph bomber produced closure and departure speeds of around 700mph.

The second method of attack was the 'Pursuit Curve'. Commencing from any direction, this gentle curve toward the bombers permitted the fighter to unload a constant and prolonged stream of firepower into the length of his target. He must, however, keep turning into the direction of the bomber stream if his fire was to remain effective. This had the undesirable effect of presenting a predictable and rapidly enlarging target to the bomber's air gunners as he flew ever closer. Visibly seeming to slide sideways to the rear, in a straight line

toward the bomber's tail (its 'apparent motion', as opposed to its 'real motion'), the fighter passed directly through the azimuth of the beam-guns – often rewarding a well-calculated deflection shot on the part of the waist-gunner and upper turret. While fleeting, this was possibly the defender's best chance of a 'kill'. Nevertheless, this dangerous second technique soon became a standard method of cutting bombers out of the box, enabling the fighters to slice the formation apart. Bombers that suffered critical damage could not hold station in the mutually protective formation for long, and as they lost power and altitude they became comparatively easy prey.

Studies of gun-camera footage have revealed that an average 20 rounds of 20mm were required to bring down a bomber; and since only 2 per cent of shells fired actually hit their intended target, 1,000 rounds would be required to be absolutely sure of a kill – demanding an impossible 23 seconds of continuous fire. In reality, the fleeting moments available to a fighter pilot, combined with enemy fire, ensured the chances of successfully engaging the target were slim. However, just one 20mm cannon-shell in the right place was capable of destroying a bomber; an exploding engine or fuel tank could rip a wing apart with terrifying ease, causing the the bomber to simply fold in half, break into pieces, or fall engulfed in flame. The frightening 30mm Mk108 could complete the task with just three rounds, and could kill a fighter with just one.

Soaring over Germany in July 1944, P-51 pilot Lt Arthur C. Fiedler (317th FS, 325th FG) was perplexed by a curious '8x8 staggered-box' formation approaching the B-17 fleet far beneath him. Initially taking them for more Mustangs, he was horrified to see what he now recognized as 64 Fw190s hacking about six Fortresses down in a single pass from the rear. However, both sides routinely believed their opponents to have the upper hand in these engagements; *Jagdflieger* always hated engaging the B-17 formations, with their heavy concentrations of defensive firepower, and invariably sustained damage whenever they got close enough to attack. The Americans flew a carefully-meshed defensive combat wing, comprising three boxes of 18 bombers each, staggered across an area 600 yards deep by 960 yards high and 2,340 yards wide, arranged to uncover as many guns as possible for mutual protection and maximum visibility. Simply getting near the formation seemed



Army personnel examine a shot-down B-17F piloted by Lt Lykes S. Henderson of 546th BS, 384th BG – one of five brought down by JG26 over Villacoublay on 26 June 1943, before the appearance of long-range escort fighters. The combination of the bomber's forward speed, the 750rpm cyclic rate of the 20mm cannon, and a near-90° interception has produced a broad strike pattern along the fuselage. A shallower angle of attack at the end of a pursuit-curve would have given a tighter concentration of elongated shell-holes; early B-17s were weak just ahead of the waist-gun windows, where a solid pattern of hits might actually cut the bomber in two.

near-suicidal. Wilhelm Holtfreter: 'When I was posted back to Lippspringer, we flew against four-engined bombers a lot, but I wasn't able to shoot anything down, because I was always too outnumbered.'

After much costly experimentation, it became clear that the best technique was to fly as close as possible, in a perfectly straight line, directly over the central axis of the bomber, from either front or rear. The former was favoured, to inflict maximum damage to cockpit and crew or, at least, to shatter the nerves of the pilots, perhaps forcing them to collide. The fighter's close proximity to its target ensured minimum opportunities for the gunners; the engineer's top turret had the best chance of hitting the fighter in approach, but was unlikely to traverse fast enough to track his exit; nose- and tail-gunners were granted extremely brief chances during the approach or escape; the waist-gunners never got a shot, and supporting fire from flanking bombers was theoretically curtailed by the danger of hitting comrades. With each fighter racing full-throttle at and over its assigned Fortress, the opening salvo would ideally rip out at least one of the '*Dicke Auto*' ('fat cars'); but a *Staffel* might suffer over 50 per cent losses in return.

Conversely, the bomber men often underestimated the damage they inflicted, and considered themselves outgunned by the fighters. Watching their formation being broken apart as the 'bandits' flashed through their ranks with cannon blazing, gunners were frequently unaware of the devastating effect of their own combined firepower. Every bomber seen to falter and shudder was inevitably seen as another victim of the Luftwaffe, but this may not have always been the case. A fleet of 1,000 B-17s and B-24s, sprawling over several miles of sky, had a total defensive armament of some 10,000 heavy machine guns, with a staggering 7 million rounds of .50cal ammunition between them. While it is impossible to research, given the massive volume of lead being sprayed in all directions throughout the formation, to an effective range of 1,000 yards, it is inevitable that a fair proportion of the damage suffered was from 'friendly fire'. The danger was obvious to USAAF planners, who devised the formations to reduce the risk to a minimum while

On 20 December 1943 Oberleutnant Franz Stigler of 6/JG27 moved in to finish off a stricken B-17 Flying Fortress over Bremen. Closing in to within a few feet, he saw massive damage to its tail and nose, and grisly evidence that most of the crew were dead or wounded. Lacking the will to give the *coup de grace* to 'the most badly damaged aircraft I ever saw, still flying', Stigler held station while repeatedly signalling the pilot, 21-year-old Lt Charles Brown, to land; but with just 'one-and-a-half' engines running, Brown stubbornly pressed on towards England. Stigler eventually gave a respectful salute, and turned back over the North Sea. The two men met in 1990, and remain good friends.



placing the echelons close enough for effective mutual support. Fields of fire had to overlap, eliminating any safe corridors between the boxes. This was a difficult and dangerous compromise, but one that had to be accepted.

By mid-1944, *Ergänzungsgruppe* instructors had largely given up teaching the classic 'finger-four' fighter formation in favour of the long-discarded arrowhead. The '*Staffel-Pfeilspitze*' comprised all 12 aircraft in two tight 'V's (seven in high lead, the second wave of five immediately below). Holding formation in a head-on pass demanded nerves of steel, but such a tactic could unleash the devastating fire of 24x 12.7mm heavy MGs and 48x 20mm cannon on the word of the *Staffelkapitän*. Destruction of the bombers now took precedence over even basic survival techniques. Flying specially up-armoured Fw190s, *Sturmgruppen* (assault groups) were raised within three of the home defence *Jagdgeschwadern*, and were solely devoted to the destruction of bombers, by whatever means necessary. This level of desperation reached its nadir in the formation of volunteer *Rammjäger* units, in which pilots swore an oath to bring down at least one bomber per mission, by ramming if all else failed; a well-positioned wing could easily slice off a tailfin or stabilizer. Unlike the Japanese *Kamikaze* – and as contradictory as it sounds – the *Rammjäger* were not expected to be suicidal, but were instructed to bale out after impact. (How many such attacks were ever actually made is the subject of some controversy.)

* * *

The *Jagdflieger* on the Eastern Front had no need to devote such attention to bomber interception. The Red Air Force lost a staggering 1,800 aircraft on 22 June 1941, the first day of Operation *Barbarossa*, including much of its antiquated bomber fleet. Thereafter, Soviet long-range bombing missions would remain modest in scale and scope; the Red Air Force adopted instead a policy of defence in depth, luring German bombers deep into Soviet territory to be met by the eventually massive fighter force. By far the greatest aerial threat to German ground forces came instead from precision strikes by fast, heavily-armoured ground-attack aircraft. Best approached from low and behind, within the dorsal gunner's blind-spot, the legendary Il-2 *Sturmovik* was so apparently bulletproof that the Luftwaffe christened it 'Iron Gustav'. Entire *Schwärme* are known to have taken turns to empty their guns into a single Illyushin, only to watch it carry on in a straight line, unperturbed. The crews were not always of equal quality. The leader was often the only experienced flyer among them, and the only one briefed on the target; if he could be singled out for attack the rest might simply scatter for home.

Dogfighting

By far the most desirable duty for a single-seat fighter pilot was the *Freie Jagd* ('free hunt'), in which he was able to roam at will through his designated patrol sector, protected by his wingman and looking for a fight. As those most likely to achieve success, the experienced men in the Gruppe were permitted first choice of duty, and few chose any alternative assignments.

The *Rottenführer* (flight leader) was the killing element; he had to retain clear observation of the front line at all times, so during major changes of direction his wingman had to switch sides to uncover his view. These well-rehearsed, balletic manoeuvres had to be executed with absolute precision to avoid any danger of collision. The *Rottenflieger* (wingman) was to hold station approximately 50m to one side of his leader, at the same altitude but slightly



The sheer scale of the B-17 – particularly its enormous tail – made it hard to judge range accurately, deceiving interceptor pilots into starting and breaking off their attacks too early. However, this camera-gun frame taken from a tail-chasing Fw190A, flown by *Unteroffizier* Willi Maximowitz of *Sturmstaffel* 1 in April 1944, confirms the terrifyingly close range at which some *Jagdflieger* engaged the 'heavy babies' – just 90m, or 295ft. Maximowitz had already been forced to bale out wounded the previous month; his *Staffel* was absorbed into IV.(Sturm) JG3, soon joined in this role by the II Gruppen of both JG300 and JG4.

behind. Always remaining on the side furthest from the front line, his primary function was to cover his leader's blind-spot and alert him to any danger; he was not to engage the enemy unless in defence of his leader. The wingman was traditionally nicknamed '*Katschmarek*' (roughly equivalent to 'Tommy Atkins' in the British Army); it would generally take some 100 missions before he was elevated to the status of flight leader himself.

When entering aerial combat or *kurvenkampf* (literally, 'turning-battle'), surprise was of utmost importance. The brevity of these engagements made every moment saved a vital advantage over the enemy. The attacker's ideal approach was from the rear, with the sun behind him. As they flew deeper over enemy territory, the 'finger-four' opened out into combat formation, putting plenty of room between them. Constant gentle shifts in altitude and lateral drift would keep the hopeful AA-crews guessing. Their left hands permanently on the throttle levers, the pairs made subtle corrections, keeping their spacing perfect. Meantime, their heads were continually twisting and rolling; before 1945 the view from the Bf109 was severely restricted by its canopy framework, its rear view almost non-existent, but the Fw190 provided good all-round vision.

A *Rotte* of Focke-Wulfs is patrolling over the endless Russian steppe when, scanning the blue for anything to worry about, the *Katschmarek*'s eye is suddenly caught by a tiny, bright glint far off to his left front ... something there. Straining to keep a fix on the fuzzy grey spot, he calls up his leader: '*Hannah 3 von 4 – Was ist das auf 10 Uhr?*' The grey smudge slowly begins to reveal its form – a long, fat, pointed nose, thick wing roots and rounded tips – and as the range closes the colour turns to a uniform dark green. The boss has recognized it straightaway: '*Achtung: Indianer!*' (Hollywood Westerns had been popular in Germany); then immediately, '*Hannah 4 von 3 – Pauke, Pauke!*' ('I'm attacking!') This last is a combined warning and instruction to his wingman to execute an immediate crossing turn. Without hesitating, the leader banks over into a steep left turn; his wingman has already lost a little height to allow him to do so, and rolls into the same sharp turn, powering up to catch his leader and slot in 50m behind his right wing.

The lone Yak fighter seems completely unaware of their presence, as they shove the throttles full open and race towards him. The leader brings them round in a graceful, sweeping curve, right onto his tail. With the Soviet plane perching high on the outer ring of his *Reflexionsvisier* gun-sight, compensating for the motion of both aircraft, the flight leader counts off the range. At 500m he fires a short burst, his rounds spraying just over Ivan's port wing. Closing rapidly to 300m, the Focke-Wulf gives another, heavier burst, bracketing his target, but the Yak makes no effort to evade. A little left rudder and ... at just under 50m he squeezes the gun button. Bright pink tracer scribbles toward the tailfin, accompanied by a deep, stuttering growl, barely audible over the roar of his engine. For a moment, a giant red star is clearly visible, just as it flashes away beneath them.

Snapping his head round to confirm the kill, the wingman is startled to see the Russian has disappeared. High off to the right, the Yak-3 is sweeping back round to them; at the last moment he had pushed his fighter into a steep, climbing turn, and is now racing down toward their tails. The days of almost unchallengeable Luftwaffe superiority over the Red Air Force are long over; since mid-1942 the *Jagdflieger* have routinely encountered inventive pilots flying high-quality aircraft in well-practised formations – and moreover, in numbers ten and twenty times their own.



'Katschmarek' stamps hard on his right rudder and wrenches the stick over, hurling himself over his wingtip; in the same instant his leader breaks high left. The Russian clings to the leader's tail as he curls down toward the ground, but at low level the pursuer's attack options are severely restricted – all he can do is tail-chase, taking any opportunity to fire. Keeping his nose straight ahead, the German gives alternating left and right rudder, swaying his tail from side to side. This *Schwanzeln* (yawing) confounds his enemy's efforts to keep him in his sights, as the wingman races to get behind the Russian. As soon as his comrade is in position, the leader orders him to fire, just as he eases his own nose up. The move puts him right inside the Russian's line of sight, but momentarily takes him clear of his wingman's cannon. The Yak takes some hard hits to the port wing, but nothing fatal. Aerial combat is routinely executed at full power; to give away any speed is generally considered suicidal, but might occasionally reward the bold. A sharp, decelerating turn could momentarily catch a pursuer off-guard, causing him to overshoot. If the pursued immediately slammed his throttles open to regain vital speed, only an outstanding marksman could exploit this fleeting tactical advantage (though such brutal treatment exacted a heavy toll upon precision-engineered machines).

Thundering up in a flat-out climb, the leader's throttle is jammed full open, but the Klimov engine is a clear equal to the BMW. At high altitude the Fw190 has its own little trick to throw at Ivan; as climbing-speed falls away, the Focke-Wulf gives sharp, jerky aileron movements, warning the pilot of an impending stall. With momentary relief, he lets go of the stick, just as his machine throws itself into an automatic flick-half-roll, followed by a high-speed, descending turn through 180°. The leader gently levels off; no pursuer had a chance of following such a violent turn. Using his dive to gain speed, the German chases Ivan into a tight, spiralling turn, struggling to lift his gunsight well ahead of his opponent. Just a few well-placed 20mm shells into his wing root, when the airframe is under such stress, could shear it straight off. (This was typically the

The *Sturmgruppe* Fw190s were fitted with extra cockpit protection; note the bullet damage to the thin metal and the armour-glass 'blinkers' of Maximowitz's aircraft after one of his interception sorties. Its extra weight of armour and weapons made the 'Sturmbock' very vulnerable to USAAF escort fighters, so these specialist bomber-killers were organized in battle-groups (*Gefechtsverbände*) with their own escorting Bf109s.

favoured point of aim for most fighter pilots; igniting or draining the fuel tanks, it might still give the enemy pilot enough time to bale out.)

Despite the leader's expertise, the Ivan is his equal, and in a matter of seconds he has got behind the *Rotte* and is racing to catch them up. Now the *Jagdflieger*s employ a popular Eastern Front evasive tactic as they attempt to shake him off: the 'Jo-Jo' is an erratic and unpredictable succession of turns, climbs and dives, throwing the aircraft wildly about and never staying in one place long enough to get fixed in the enemy's sights. The wingman strains to mirror his leader's every move; for the most part, evasive manoeuvres are not the well-practised ballet rehearsed with the *Ergänzungsstaffel*, but reflex actions prompted by gut instinct, desperation and fear. But the eye-blink of delay before the wingman can copy his leader allows their adversary to anticipate his next move; caught for a second in the Russian's sight, the 'Katschmarek' feels a perfectly-timed burst of fire slam through his engine cowling and canopy. The instrument panel disintegrates before his eyes, with smashed components, dials and switch-boxes bursting all around the inside of the cockpit. Stamping hard on the right pedal, he throws over into a straight dive. Struggling to level off, he is suddenly aware of a stiffness in his left leg; the grey-blue cloth of his flight trousers is torn and dark, and a wisp of yellow smoke curls up from the ragged hole by his knee. There is no discernible pain, only dead weight, and a searing heat.

The flight leader's priority now is to get his injured wingman back to safety; to endanger him in order to pursue a kill is universally considered unforgivable, and in JG52 any pilot found guilty of losing a wingman in this way instantly loses his position, thereafter serving as wingman himself.

H

12./JAGDGESCHWADER 11; GROSS-OSTHEIM, BAVARIA, JANUARY 1945

In its last major offensive, *Bodenplatte*, the Luftwaffe inflicted heavy damage upon Allied airfields, destroying or badly damaging no less than 495 aircraft. Most fields remained unusable for the next two weeks, but the Allies would recover. The Luftwaffe lost 271 fighters in its execution, mostly employed in the *Schlacht* and *JaBo* roles, for which many were untrained. Secrecy had been so great that few *Flak-Kommandeure* were informed and batteries all along the front opened fire on the Luftwaffe formations, en route to and from their targets (at this stage, the *Kanoniere* logically assumed any large formation to be Allied). With 169 pilots killed or missing, 19 wounded and 69 captured, 1 January was the war's most costly day for the Luftwaffe.

Clearly shaken and exhausted, a youthful *Rottenflieger* (1) dismounts his Fw190, after strafing airfields at Asch, Belgium. Sheer terror and intensity of the morning's events have caused him to lose control of his bladder – a common occurrence. This 'Nachwuchs' (new growth or sprout) is typical of the late-war pilot; with just over a year in training, and as little as 75 hours' flight-time, he flew perhaps the best combat aircraft of the time, but always against overwhelming odds. The last of the *Jagdflieger* rarely survived more than four combat missions.

Insets :

Introduced 26 June 1942, the *Anhänger zur goldenen Frontflugspangen* pendant (2) was soldered beneath the gold *Frontflugspangen* to denote additional operational flights; 500 for day-fighters, 400 for heavy-fighters and ground-attack and 250 for night-fighters. 29 April 1944 saw the adoption of more accurate lozenge-shaped *Anhänger mit Einsatzzahl* (operational number) (3). Each award was accompanied by a *Verleihungsurkunde*, recording the recipient's name, unit and date of entitlement – including mission clasps and the honour-goblet (4, 5). Descriptions of the combat mission clasps – *Frontflugspangen* – can be found in the text of p26–27 (6, 7, 8).

Several units were distinguished by historically based *Erinnerungsbänder* commemorative cuff-titles (bottom left), honouring past (and more recently mourned) Luftwaffe and Nazi heroes: JG2 'Jagdgeschwader Richthofen', JG3 'Jagdgeschwader Udet', JG26 'Jagdgeschwader Schlageter' and JG51 'Jagdgeschwader Mölders'. Unique among the destroyer units, Zerstörergeschwader 26 was titled 'Geschwader Horst Wessel'.



Jagdgeschwader Richthofen

Jagdgeschwader Udet

Jagdgeschwader Schlagerer

Jagdgeschwader Molders

Geschwader Horst Wessel

K. Kopinski

Following the pair of Focke-Wulfs as they race and weave towards German lines, Ivan is well aware that he must soon break off; his fuel is limited, and there is nothing to be gained by getting anywhere near the waiting Flak batteries. The alarming rate of ammunition expenditure alone has dictated that the engagement has been short-lived. Before long, the swirling fight has to come to an end – typically, without discernible ‘victory’ for either side, beyond survival.

Intense and distressing experience is etched on the face of this pilot returned from a Channel mission in 1940 – perhaps suffering from what they called ‘*Kanalkrankheit*’, ‘Channel-sickness’. The Luftwaffe did not ignore combat stress; mentally exhausted men were routinely withdrawn from the frontline for a month’s medical leave. This rest, and the subsequent return to their comrades, were usually effective – up to a point.

Abschuß!

With up to two years’ training behind them, many seasoned combat pilots became troubled, and even depressed, by their apparent ineffectiveness in battle, their feelings of inadequacy heightened by any successes achieved by their comrades. It was not unusual for frontline wingmen to have flown around 100 combat missions before they could register effective hits upon a target. Although not fully appreciated at the time, such a protracted development period was inevitable when actual firing-time accounted for only a few seconds per mission. Assuming all weapons were fired in unison, the average ammunition load of 210 rounds would provide a mere 15 seconds continuous gunfire. When extrapolated, we see that those 100 missions amount to approximately 25 minutes of firing practice – and depending upon how heavily-

committed the Gruppe was, that 25 minutes could be spread across anything from a few weeks to the best part of a year. Much time was thus spent ‘getting it wrong’, before the pilot could determine just how far off his aim was. With a lot of initial luck, he would survive long enough to hone all his tactical skills to a fine edge; and once he had ‘got his eye in’, there might follow a steady accumulation of aerial victories.

A victory claim was, according to official radio procedure, registered with the cry ‘*Horrido!*’ In practice, many simply called ‘*Abschuss!*’ to their wingman or gunner, whose response was, hopefully, ‘*Viktor, Viktor*’ rather than ‘*Negativ*’. For any claim to be confirmed by the wingman, he had to witness the aircraft explode or crash or the pilot bale out. Corroborating the time and location with his leader, he would make a mental or (if feasible) written note, to be reported to his *Staffelkapitän* immediately upon their return. If no such result was witnessed, the wingman had no choice but to deny the claim. It was occasionally possible for an unconfirmed *Abschuss* to be awarded later, however. If a claim was contested by other units, including local Flak positions, investigation teams could (in German-occupied territory) examine the wreckage. Where *prima facie* evidence confirmed the damage as being a result of



fighter action, aircraft and damage had to be matched to the claiming report. The high level of detail that airmen included in each *Gefechtsbericht* (combat report) meant that they frequently made note of aircraft codes and distinguishing insignia, any observed damage, and approximate location. *Munitionsanzeige* (round-counters) connected to the guns confirmed the calibres and quantities of rounds expended. If no deciding factor could be established, the kill was recorded but not credited to any unit.

Landing

The 'Radfahrer' ('cyclists', standard code for friendly fighters) set course for 'Gartenzaun' ('garden fence', home base), and a waggle of the leader's wings signals his wingman to close up. With damaged machines and ammunition exhausted, they hugged a low cloud-base to protect them from attacks from above. If damaged, JG52 pilots would at one time make three low-level circuits of the field, allowing ground crews to check for undercarriage damage before landing, but this practice proved unreliable and was short-lived.

With the tail down the pilot was virtually blind, so a mechanic generally sat on a wing to guide him back to his pen. The ground-controller, meanwhile, beckoned with both hands above his head for the aircraft to keep straight, while one arm extended straight up indicated which brake to apply, the plane swiftly pivoting about the locked wheel. Crossed forearms meant 'Cut the engine', and the aircraft came to a stop.

Then began the chore of writing up the detailed combat reports ...

Defeat

In the final days the overriding priority of airmen in the East was to escape the Soviet advance; any remaining aircraft were destroyed, and each unit tried to make its way westwards. Where sufficient fuel could be found the Gruppe made its last journey in slow-moving columns of overloaded trucks and cars. Some were accompanied by wives and families, fortunate enough to have lived nearby (sometimes even on operational bases). A handful of pilots flew to western airfields to surrender, tearing out radios and armour to squeeze in other personnel; but most simply had to walk. As Allied ground forces progressively overran scattered airfields from all sides, thousands of aircraft and airmen fell into their hands. The depleted and disheartened survivors of each *Geschwader* in turn accepted their fate, yet remained justly proud of their achievements. The very fact that the Luftwaffe had maintained its struggle to the end, against overwhelming odds – even launching major, though ultimately unsustainable, offensives – was testament to their courage and loyalty: loyalty not to any regime, but to each other.

SELECT BIBLIOGRAPHY

- Brayley, Martin J., *The USAAF Airman, Service & Survival*, Crowood Press (2007)
Constable, T. J. & Toliver, R. F., *Horrido!*, Arthur Barker Ltd. (1968)
Eschoeltsch, Ehrenfried, *Der Dienstunterricht in der Luftwaffe*, Ritter, Berlin (1941)
Galland, Adolf, *The First and the Last*, Ballantine Books Inc. (1954)
Hannig, Norbert, *Luftwaffe Fighter Ace*, Grub Street (2004)
Heilmann, Wilhelm, *Alert in the West*, Cerberus Publishing Ltd. (2003)
Knocke, Heinz, *I flew for the Fuehrer*, Evans Brothers Ltd. (1953)
Spoden, Peter, *Enemy in the Dark*, Mönch Medien & Print, Essen (2008)



1945 or 1946: wearing his 'demilitarized' *Fliegerbluse* over a knit sport shirt and homemade necktie, this recently released airman faces new ordeals as he tries to make a new life in the shattered ruins of his country. A decade in the future, many 'Experten' would be invited to lead the new *Bundesluftwaffe*; but most *Jagdflieger* would simply carry on trying to merge back into society, and rebuild their lives and their country.

INDEX

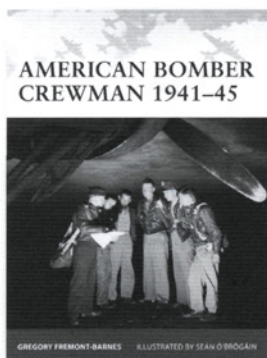
References to illustrations are shown in bold. Plates are shown with page locators in brackets.

- accommodation 14–15, 39–40
aces 4, 31
air gunners 13–14, 27, 28, 43, 45, 46, F (49)
air signals *see* wireless operators
aircraft
 climate's effect on 32
 effects of crashing into water 22
 emergency landings E (37)
 fighters' favourite point of aim 59–60
 hiding 23, 51
 housing 38
 penalties for damage to 20
 servicing level 39
 stain concealment 50
aircraft types
 B-17 55, 56, 57
 B-25 G (52–53)
 Bf109 5, 6, D1 (33), 39, 39, 43, 47, 51, 58
 Bf110 5, D2 (33), 43, 45–46, 45
 Bf110 canopies 43
 C205v G (52–53)
 Fw190 5, 38, 39, 42, 47, 50, 58, 59
 gliders 7, 10
 He51 trainers A4 (9)
 Il-2 Sturmovik 57
 Me262 6
 Ta152 6
 tropicalized 39
airfields and airstrips 14, 14–15, 35–39
alcohol 19
awards B1–3 (16), 26–28, 27, H2–8 (60)
baling out E4 (37)
battle preparations and waiting 11, 41–2, 41, 42
bomber-escorts 44–45
Britain, Battle of (1940) 41
Brown, Lt Charles 56
callsigns 43
camaraderie 28–29
chivalry 29–32
combat stress 62
command 35
competitiveness 31
crime and punishment 18–20
Crump, Uffz Peter 29–30
cuff-titles, commemorative H (60)
day-bomber interception 51–57, G (52–53)
desertion 34
destroyers 45–47
Deutsche Jungvolk 7
Dilthey, Uffz 31
Dobislav, O/Ltn Max 29
dogfighting 57–62
drop-tanks 44
emergency procedures E (37)
equipment
 compasses B5 (17)
 goggles C1 (25)
immersion suits 23–26
lifeboats C11 (25)
map-boards F (49)
oxygen masks 23, C8–10 (25)
parachutes B6 (17), 43, 47
survival gear 15, 21–23, C3–5 (25), C12–15 (25), E3 (37), 50
toolboxes D (33)
wipe-clean noteboards 23
Fly-Throughs 54
food 15, 15, 40
formation-destroyers 46–47
formations 43, 55–56, 57
fuel and fuelling 35
Galland, Adolf 29, 31
Göring, Hermann 20, 31, 34–35, 34, 44
ground crew 11, 30, D (33), 38, 39, 42, 47
 relations with air crew 28–29
 selection 10–11
 turnround time 35
Hannig, O/Ltn Horst 50
Hannig, Norbert 8, 30–31, 34, 40, 41
Hartmann, O/Ltn Erich 20
Hitler Jugend 7
Holtfreter, Wilhelm
 on Bf109s 36
 as day-bomber interceptor 56
 on morale 32, 41
 shot down 30
 on training 11, 12, 14
 on waiting 42
hypothermia 22
Jagdflieger
 duration of frontline service 5
 effectiveness 5, 62
 survival rates 60
Jagdwaaffe: functions and achievements 4
Johanssen, Lt Karl 28
landing 63
leadership: attitude to 32–35
leave 15
Loerzer, Gen Bruno 20
logistics 35
Lützow, *Oberst* Günther 34
Maximowitz, Uffz Willi 57, 59
medical tests 7–8
Mewes, Karl-Heinz 10–11, 16, 19, 28, 35
Meyer, Uffz Hans 30
morale 32–35, 40–41
Müller, Fw Rudolf 27
NCOs A2 (9), 16–18, 18, 21
night-fighters 26, 40, 46, 47–50, F (49)
 navigation and fire control 45, 46, 47–50, F (49)
Nuremberg raids 6
off-duty 15, 16, 19
officers A1 (9), 13, 18, 29, F (49)
Operation *Bodenplatte* (1945) 6, 60
Operation *Cerberus* (1942) 5–6
 organization 7, 35
promotion 16–18
Pursuit Curves F (49), 54–55
radar 45, 46, 47, 48–50, F (49)
radio *see* wireless engineers;
 wireless operators
RAF 6, 47, 50–51
Rammjäger 57
Red Air Force 57, 58–62
Rosenberger, O/Fw Paul 34
Scheer, Klaus 24, 26
Schmitt, O/Ltn Herbert 34
sea: survival at 21–26
Soviet Union: German invasion (1941–42) 57
Spoden, Peter
 in action 22–23, 46, 48
 on air gunners making kills 28
 on food 15, 40
 on Göring 34
 shot down 36
 on wireless aerials 44
Sterr, Fw 'Bazi' 31
Stigler, O/Ltn Franz 56
tactics 54–57, 58–60
take-off 43
training 8–10, 11–14, A (9), 10, 12, 13, 16–18
uniforms and clothing
 flight gear 21, 21, 22, 23, C2–4 (25), F (49)
 footwear 21, 22, 39, 47
 headwear 23, G (52–53)
 labelling C7 (25)
 lanyards 18
 'Spanish look' B (17)
 trainees 12
 tropical 14, 22
USAAF 6, 29–30, 44, 51–57, G (52–53)
venereal disease 19
victory criteria and claims 26–27, 62–63
victory sticks F (49)
Waber, Gen Bernhard 20
weapons and armament
 30mm Mk108 55
 ammunition needed to make a kill 55
 formation-destroyers 46–47
 guns' position and effectiveness 32
 machine guns 42, 45, F (49)
 night-fighters 50–51
 pistols A4 (9)
 rifles 15
 swords B4 (17)
 US bombers 56–57
wingmen 57–58, 60, H (61)
wireless engineers D3 (33)
wireless operators A3 (9), 13, 43, 45, 46
 instrument array 44
Wolf, Fw Albin 31
women 19–20

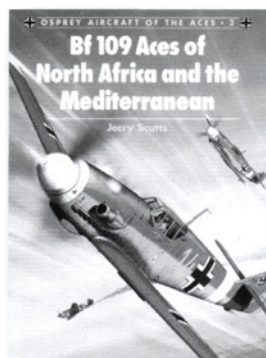
RELATED TITLES



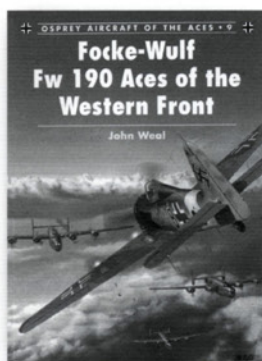
WAR 099 • 978 1 84176 907 3



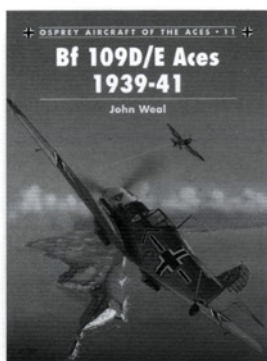
WAR 119 • 978 1 84603 125 0



ACE 002 • 978 1 85532 448 0



ACE 009 • 978 1 85532 595 1



ACE 011 • 978 1 85532 487 9



MAA 225 • 978 0 85045 966 1



MAA 377 • 978 1 84176 404 7



AEU 001 • 978 1 84176 046 9



AEU 006 • 978 1 84176 286 9

VISIT THE OSPREY WEBSITE

Information about forthcoming books • Author information • Read extracts and see sample pages
▪ Sign up for our free newsletters • Competitions and prizes • Osprey blog

www.ospreypublishing.com

To order any of these titles, or for more information on Osprey Publishing, contact:

North America: uscustomerservice@ospreypublishing.com

UK & rest of the world: customerservice@ospreypublishing.com

WARRIOR • 122



Insights into the daily lives of history's fighting men and women, past and present, detailing their motivation, training, tactics, weaponry and experiences

JAGDFLIEGER: LUFTWAFFE FIGHTER PILOT 1939-45

Fighter pilots have always occupied a glamorous place in the history of warfare. The Luftwaffe fighter pilots or *Jagdflieger* were undoubtedly amongst the best in the world, and their bravery, skill and sometimes astonishing number of 'kills' have become the stuff of legend. Over the years much has been written about these aces, but this book seeks to examine instead the 'ordinary' Luftwaffe pilot, whose kills may have been few in number, but which were just as hard-won. These men, aces and non-aces alike, all shared the same 'aggressive spirit, joy of action and the passion of a hunter'. This book explores every step of a *Jagdflieger's* career, from his enlistment and intensive training to his deadly aerial duels.

Colour artwork ■ Photographs ■ Unrivalled detail ■ Clothing and equipment

US \$18.95 / CAN \$22.00

ISBN 978-1-84603-167-0

OSPREY
PUBLISHING



WWW.OSPREYPUBLISHING.COM