



LUFTWAFFE COLOURS



STUKA

Volume Two

Peter C Smith



**LUFTWAFFE
JU 87 DIVE-BOMBER
UNITS
1942-1945**



1942 1945

Ju 87 DIVE-BOMBER UNITS

"I often visited the Stuka squadrons on their return from bombing over Warsaw, spoke with the crews about their impressions and inspected the damage where aircraft had been hit by flak. It was almost a miracle that some of them got home, so riddled were they with holes – halves of wings were ripped off, bottom planes were torn away, and fuselages disembowelled, with their control organs hanging by the thinnest threads. Our thanks were due to Dr Koppenberg and his engineers who produced such aircraft as the Ju 87 which was still in use in Russia in 1945."

From 'The Memoirs of Field Marshal Kesselring,' William Kimber Limited, London, 1953.



The *Stuka* – fresh thinking required...

Introduction

The Junkers Ju 87 dive-bomber made the very first bombing attack of the Second World War; six years later limited numbers were still operational in the *Luftwaffe*'s front line force on the last day of the war when Hans-Ulrich Rudel, *Geschwaderkommodore* of SG 2, surrendered his unit intact to the Americans at Kitzingen airfield. These are hard-and-fast facts. One would assume that, in the normal course of events, any aircraft that served throughout the war in this manner, and, moreover, one that altered the very structure of warfare itself, on land and in the air, would deserve some merit in military aviation history. But, for many reasons, the *Stuka* has always had a bad press. In spite of – one might almost say *because* of – the plethora of new books of varying quality that appear with astonishing regularity on this aircraft, the tone, even sixty years after its time of glory, is almost universally dismissive.

“
Lost is only
he who loses
himself...”

Oberst Hans-Ulrich
Rudel

Why should this be? It was understandable at the time, that British and then American propaganda would take such a line. After all, the Ju 87 had just contributed in a major way to the most humiliating series of defeats which several European nations had ever suffered at the hands of an enemy in wartime. The need to counter the almost pathological fear the *Stuka* engendered was paramount to the nations' wills to resist, and to regain some pride after such disastrous shocks. And so the great debunking commenced and continued throughout the war. The fact that the Allies could out-perform Dr Goebbels, so to speak, did not matter much; the truth was a disposable asset and as a politician, Churchill proved as capable as Hitler in distorting it in the name of survival, while the media was happy to follow. The emphasis was to ignore the accomplishments of the *Stuka*, and its accuracy, and concentrate on its lack of speed, its short range and, above all, its vulnerability to modern eight-gun fighter aircraft. All these points were valid enough in themselves, but could be applied equally to any Allied bomber aircraft of the time, sometimes more so.

And so, largely for the benefit of public consumption, there followed a supposed glut of *Stuka* 'massacres' when Ju 87s were caught without fighter cover during the Battle of Britain or in the North African campaigns. The fact that this did not happen very often was of course, not mentioned. “*Our pilots weep for joy when they see them,*” boasted one British Air Marshal, and I am sure they did, but at the Meuse crossing, at Calais, at Dunkirk, at Crete, at Leros and in a thousand battles, they did not see them quite often enough to effect the issue. There can be no dispute that the *Stuka* was no match for a Spitfire, (although the writer has several eyewitness accounts of Ju 87s actually outmanoeuvring Hurricanes by turning inside them). But what did this prove? Was a Vickers Wellington, or a Fairey Battle or an Avro Lancaster a match for a Focke-Wulf Fw 190? And what did such aircraft as the Fairey Battle, the RAF's answer to the army support mission in 1940, actually achieve in its very short life? The answer is absolutely nothing at all.

Suitability and sustainability ought to count as high as a top speed in a combat weapon. The Ju 87 was a very strong aircraft, of smooth-sheet monocoque and stressed-skin construction. The fuselage was constructed on the 'nutshell' principle in two half-shells with four longitudinal stringers connected by vertical frames of stressed-skin sheet. This made for a uniquely strong and durable frame which withstood enormous punishment. There have been numerous testimonies to the value of this sturdy build from pilots who owe their lives to it after their *Stukas* had received damage that would have destroyed most aircraft easily. Perhaps the most well-known is that voiced by Kesselring, who said: “The *Luftwaffe*'s thanks belong to Dr. Koppenberg¹ and his engineers who created an aircraft such as the Ju 87 that was still able to be operated on the Eastern Front as late as 1945.”

The *Stuka*'s inherent strength, found in the combination of a strong, fixed undercarriage and a centre wing section firmly built into the lower fuselage, enabled it to operate from primitive and improvised landing strips in all manner of weather conditions, when Allied aircraft were grounded. The rugged design aided ease of maintenance in the field resulting in an uncomplicated aircraft groundcrews could easily keep flying. Thus the *Stuka* remained the ideal close-support aircraft. Not the fastest; not the longest ranged; not the heaviest carrier, *but almost always available!*

Warplanes are usually designed for a specific task. To judge whether any military aircraft was a success or not, one must ask oneself not whether it was successful at every other mission or role it might have become involved in, but whether it performed adequately in the role *for which it was*

¹. Dr. Heinrich Koppenberg, Chairman of the Junkers Advisory Board at Dessau, which oversaw the Ju 87 development programme.

1942-1945

designed. If the *Stuka* is assessed on that true criteria, there can be only one answer – it was most outstandingly successful. The Ju 87 was built as a dive-bomber, without compromise; it was its *raison d'être* and no other dive-bomber performed so well in that mission because there was unstinting commitment to its design and from its crews. As Eric 'Winkle' Brown, the renowned British Fleet Air Arm test pilot who flew all manner of aircraft types, was to testify many years later, the Ju 87 was far-and-away the best of its kind, and he included in his assessment such more contemporary aircraft as the Douglas Dauntless, the Curtis Helldiver, the Vultee Vengeance and the Blackburn Skua. Judge the Ju 87 *Stuka* also by its merits in the role of close air-support, and again its performance was superior to any contemporary.

But one can turn the argument right around. Let us consider other specialist aircraft and compare. The Fairey Swordfish is a case in point on the British side. It was a flying antique, a biplane in an age of the monoplane, slower than the *Stuka*, even more restricted in its mission, as a naval torpedo-bomber. It could not dogfight with a Messerschmitt Bf 109, as the fate of Lt/Cdr Eugene Esmonde and his gallant Swordfish crews demonstrated during the famous 'Channel Dash' in February 1942 when all were lost. Yet its achievements at Taranto and in the crippling of the *Bismarck* – limited but spectacular – are lauded today, whereas its failures at Oran, at Spartivento, at Calabria, are forgotten. It was still flying missions at D-Day and has a unique place of affection in the annals of military warfare. The *Stuka* however, achieved much, much more, over a wider field of combat and for far longer, but is judged a failure.

Finally, one must compare the standard – and almost compulsory – view taken by historians over the years, with the views of those who were actually there. Take for example this description of the *Stuka* in North Africa in 1942: "...throughout this time the Junkers dive-bomber would be a steadily declining force on the field of battle, overtaken by events, overshadowed by the rise of the fighter-bomber and overwhelmed by the enemy's growing numerical superiority."²

Now read how a young British Army officer, who was actually in the desert, described the same aircraft's effect on operations: "Here, while I sit in the desert with an Me 110 circling overhead, the wireless broadcast of 0915 hours is telling us that the great feature of our recent operations here was that the RAF held complete mastery of the air by the simple procedure of preventing the enemy aircraft leaving the ground. This is completely untrue. In this regiment alone we had thirty casualties from air attack alone. It is true that from time to time the RAF makes a sortie and bombs known enemy aerodromes. But Jerry does not rely on them alone. He scatters his aircraft all over the desert, which is full of natural landing grounds and feeds and maintains them if necessary from the air. While our sorties are sporadic Jerry is always in the air watching every movement and attacking every target worthwhile with bombs and machine-gun fire – and his needle bullets go through our armour. His army co-operation is fine – whenever he wants air support his front line troops wireless 'Stuka' and give a map reference and it comes at once, whereas we have to apply through Brigade to Division and from them through ALO to RAF Command. When (and if) it comes it is two hours late and the whole situation has changed and the bombs are dropped in open desert, or, as on more than one occasion, on our own troops."³

But perhaps the greatest vindication of the *Stuka* as a close-support aircraft came decades after the end of the Second World War, when a specialist aircraft was built with the specific role the Ju 87 had made its own during the last years of that conflict, the Fairchild-Republic A-10 Thunderbolt. It was slow, but highly manoeuvrable. It was a low-level operator, but could absorb tremendous punishment and survive intact. It could not dog-fight with MiG jets, but it could operate close behind the combat lines and linger over the battle area. It was built in the face of the fiercest opposition to perform her specialist role. In combination with Allied armour, it won the first Iraq War.

Perhaps it is finally time to start to judge the *Stuka* impartially.



Dr. Heinrich Koppenberg, head of the design team that maintained the Ju 87 as a front line aircraft throughout World War 2.

“...the *Stuka* however, achieved much, much more, over a wide field of combat and for far longer, but is judged a failure.”

² John Weal, *Junkers Ju 87 Stukageschwader of North Africa and the Mediterranean* (Osprey, Wellingborough, 1998).

³ Lieutenant Colonel Apsley, Letter dated 20 June, 1941 (National Archives, AIR8/631).

The *Stuka* 1942 – fresh thinking applied

Certainly, as 1941 gave way to 1942, there was much for the *Luftwaffe* to think about. Two years of uninterrupted victory, the perfection and vindication of the *Blitzkrieg* theory, on which the whole force had been constructed, had come crashing to a halt in the mud and snow of the Russian winter. The hitherto invincible *Panzer/Stuka* combination relied on speed and precision, the ability to keep the enemy off balance, for its cheap and overwhelming victories. Once the Germans were forced to give the enemy time to pause, to regroup, to plan – especially an enemy the size and strength of the Soviet Union, the 'Lightning War' became a thing of the past. The old spectre of attrition, the nightmare of the First World War, began to reappear and the *Luftwaffe* had *not* been equipped for that.

So a general re-appraisal had to be undertaken, and in terms of *Luftwaffe* aircraft, this applied across the board, and included the Ju 87 *Stuka*. As has been described, the Junkers Ju 87 had never been thought of as more than an interim type until the much-vaunted Me 210 emerged. As we have seen, in 1941 it became very clear that this aircraft was not going to appear in anywhere near

significant numbers. What alternative was there? The unpalatable answer for the Commander-in-Chief of the *Luftwaffe*, *Reichsmarschall* Hermann Göring, and his subordinates was '...none'. Perforce then, production of the Ju 87, which it had been planned to soon terminate, was instead to continue, indeed, it was to be stepped up to deal with the grim situation German forces found themselves in at the end of 1941, fighting for their lives in the endless Russian wastes, on the back foot in the North African desert and now fighting a two-front war against the three most powerful and

industrially strong nations in combination against them, the British Empire, the Soviet Union and, since 7 December, the United States.

The limitations of the Ju 87 had been known for a long time, but while the Me 210 seemed just around the corner, the *Berthas* and *Richards* sufficed to serve their purpose and performed admirably. The Chief of the General Staff of the *Luftwaffe* *General der Flieger* Hans Jeschonnek's much-vaunted Concentrated Aircraft Procurement Programme of 7 November 1938 had promised eight and later twelve, *Sturzkampfgeschwader* by the autumn of 1942. Now, with those promises in ruins and the *Generalluftzeugmeister*, Ernst Udet, in his grave, those same limitations loomed as major problems that needed some radical thought to put right. A whole new re-working of the existing *Stuka* design was obviously required for it to cope with new battlefield conditions and demands. In fact, a series of modifications was already under way and was to result in a whole new series of Ju 87s, the first of which was the *Dora*.

The *Dora*

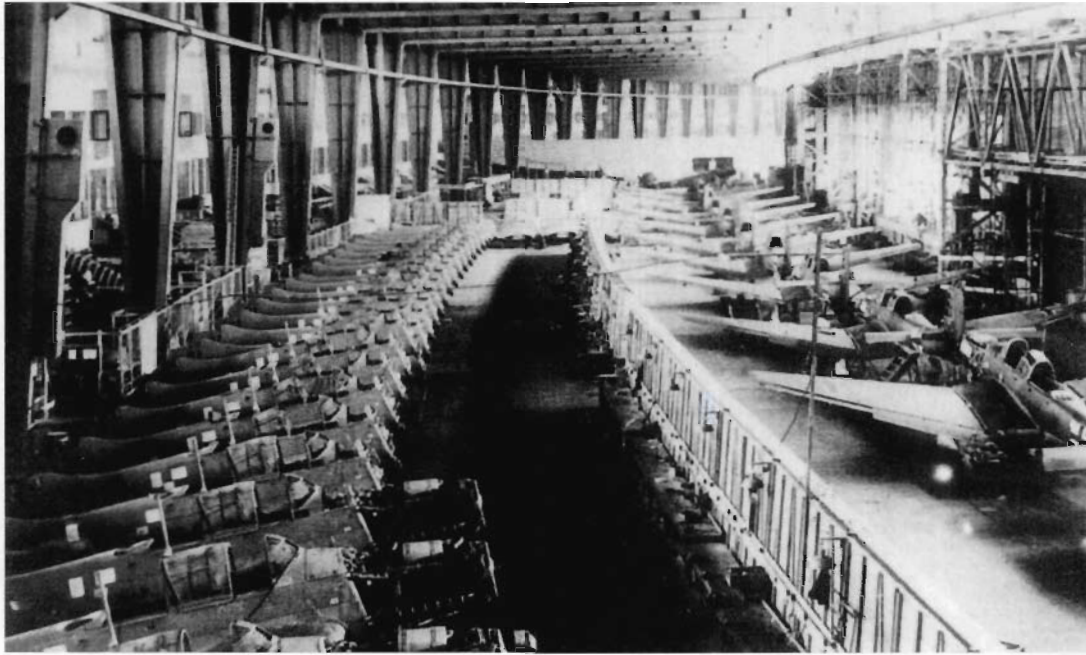
The Junkers Ju 87D was the end-product of a wide-ranging re-evaluation by the *Reichsluftfahrtministerium's* Technical Office of the needs of the *Luftwaffe's* close-support arm by the OKL (the *Luftwaffe* High Command) within the context of the new situation in which Germany's armed forces now found themselves. However re-design work had already started as early as 1940 for many of the improvements finally incorporated. Considerations for the new type included improvements to speed and range, both of which involved the need for of a new power plant. The 'cleaning up' of the aircraft's profile would also contribute and make a virtue out of necessity due to accommodating the planned new engine.

There was a need for the existing bomb-release mechanisms to incorporate the new range of ordnance being developed and to simplify the whole process and make maintenance in the field less complex. The need for a heavier lift was shown by operations against the Norwegian, Belgian, French and Soviet fortresses, and by the unexpected sturdiness of the larger, heavily armoured warship



An Me 210 A-1
W.Nr. 2100182
belonging to
Versuchstaffel 210
coded 2H+AA. From
the outset it was
intended to fit dive
brakes as standard to
the Me 210 although
due to the poor
handling of aircraft it
was never used in the
role of dive bomber.
This machine was later
transferred to III./ZG 1
and was destroyed by
flak on 5 December
1942.

1942-1943



Although the first five prototypes 'D' series prototypes were built at Dessau the major series production was carried out at the Berlin-Tempelhof plant which up to the end of 1944 had been able to carry out the work undisturbed by Allied bombing.

targets, such as the *Illustrious*, *Warspite* and *Marat*. Although the *Stukas* had sunk two Greek battleships in dock⁴, they had been old, obsolete vessels and had not been – in reality – a proper test. Armour-piercing weapons would be required and the *Stuka* needed to lift them, even if that meant omitting the 'back-seater' on special missions.

By early 1942, the *Stukagruppen* were mounting up to six sorties per day holding the lines in the East, and in order to achieve fast turn-rounds in both refuelling and re-arming, coupled with the difficulties of supply of too many or too complex parts, simplicity was the key for the 'Black Men' or ground crews, on whose backs complex operations rested.

These crews worked in appalling conditions to keep the *Stukas* operational and in the air and, fortuitously, their voices were listened to by *Luftwaffe* commanders.

Both defensively and offensively, an upgrade of the existing armament of the Ju 87 was an urgent requirement, as much a need for greater firepower in strafing enemy troops concentrations, as for its own defence. At the same time, aircrew protection needed to be enhanced both from fighter attack astern and Flak from below.

Each of these issues was to be addressed in the new design. Because the production line of the *Weser Flugzeugbau* at Tempelhof was fully extended in turning out the existing *Bertha* and *Richard* to meet the voracious demands of the front, the decision was made to hand build the *Dora* prototypes at Dessau. The order for the first of five prototypes was therefore placed there in June 1941.

Prototype Doras

The initial *Versuchsflugzeug* was the V 21 (W.Nr. 0870536, civilian registration D-INRF), which was rolled out in November 1940 with a flying programme due to commence the following month. However, preliminary flight-test trials, which were to be conducted by a *Bertha* (W.Nr 0321) had to be continually postponed due to repeated problems encountered with the new power plant, the Jumo 211 J (P) engine.

There had been a decision to fit new models of the twin-engined Junkers Ju 88 medium bomber with this same engine and the resultant double requirement, both of a high priority, caused some concern. It was proposed, therefore, to fit the *Dora* with a totally new power plant, the Daimler-Benz



Workmen push a semi-completed Ju 87 D from the assembly hall for final fitting of its flying surfaces, cowlings and propeller. The fitting of the Jumo 211 J engine, was a welcome improvement to the aircraft and offered 1400 hp for take-off and 1410 hp at 5,000 metres. Along with the reprofiled cowling and canopy, the D-Series was instantly recognisable from the earlier variants in the Ju 87 series.

⁴ These two 'antiques' were the *Kilkis* and *Lemnos*, 12,500-ton pre-Dreadnoughts, the former *Mississippi* and *Idaho* respectively, sunk at Salamis on 23 April 1941. They had been considered as obsolete even in the First World War!

The Ju 87 V21 W.Nr. 0870536 coded D-INRF and although the prototype was plagued with continuous problems to its Jumo 211 J engine also fitted with skis and is shown here after the collapse of the starboard undercarriage.



DB 603 in-line engine. These plans were persevered with, despite the fact that, by November 1941, tests on the latter had shown conclusively that it was inferior to the new marks of the Jumo 211 J. However, because the designated engine was still not ready, not only was design work continued in December incorporating the DB 603, but another alternative, the Jumo 213 was put forward by the RLM. In the event, the Jumo 211 J and P, both fitted with supercharger intercoolers, with the header tank repositioned to the engine's port side, was finally adopted as originally planned.

The adopted Jumo 211 engine developed 1,400 hp and by a crankshaft reduction ratio of 1.833-to-1, was able to drive the new Heine variable-pitch, three-bladed composite construction propeller.⁵ Maximum speed rose to 408 kph. Fuel consumption was 320 litres per hour at an altitude of 5,000 metres. The adoption of internal fuel tanks gave an improved range of 795 km, which the addition of a pair of 300 litre fuel tanks, one beneath each wing, further extended this to 1,522 km in the production models.

While fitted with the experimental ski undercarriage in late 1941, the V21 was damaged when one leg broke away, damaging the propeller and starboard wing. Repairs were carried out in November and the following spring she was utilised for cowl flap testing, before being adapted for front-line service.

The V22 and V23 prototypes (W.Nr. 0870540, SF+TY and 0870542, PB+UB) were produced in December 1940, both *sans* engines because the Jumo 211 J did not become available until the end

⁵ However, while undergoing trials with V 21, experimentally fitted with the newer Jumo 211F which developed 1,420 rpm, the vulnerability of this airscrew construction was harshly exposed, the blades splitting. A VS 11 adjustable type, of 3.46m diameter, which had a safety limit of 2,250 rpm, had to replace it.



An elaborate spinner design on a Ju 87 D-3 of an unknown unit.

of February, so prototype flight-testing at Rechlin was delayed until March 1941 for the first pair, and April for the V23, whose testing did not begin until the following month.

Cold-weather tests in November 1941 proved highly successful with the second prototype, and were followed by a series of vibration tests. The following August this aircraft was lost in an accident, plunging into Lake Müritz while still working as a trials machine from nearby *Erprobungsstelle* at Rechlin. The full results of the Russian winter of 1941/42 hit home very hard and this led to a drastic re-think before the spring of 1942. The fitting of *Kaltstart* (cold-start) equipment to the aircraft added about 40 kg to the Ju 87's all-up weight, but worked quite efficiently. In the field, the ground crew initially had to run the engines at half-hourly intervals all night in extreme conditions, but the introduction of a portable hot air blower eventually helped, once the contraption itself could be persuaded to start! The building in on the production line of a more comprehensive all-over cold weather protection, *Winterbordnotausrüstung*, was finally universally adopted.

Meanwhile, also in May 1941, the remaining two prototypes were completed. V24 (W.Nr. 0870544, BK+EE) and V25 (W.Nr. 0870538, BK+EF) shared the same initial delay as their sister machines – and for the same reasons – the latter having to wait until July before flight-testing could commence. Each of these machines was built as a specialist machine, the V24 to trial the proposed carrier-based *Stuka*, as that project had been temporarily resurrected. While at Rechlin this aircraft suffered some damage, but later was repaired and, (as a *Richard*), transferred to an operational unit. The V25, in turn, was selected as the experimental vehicle for the D-1/*trop* variant of the model and tested the new Delbag sand filter.

First orders placed

So successful were the tests conducted at Rechlin by these prototypes, which were soon joined by eight production models, that no fewer than 1,037 *Doras* were ordered almost immediately, on 1 June 1941. The programme was to be phased in at the end of the current run of *Berthas* and completed by the Weser Bremen-Lemwerder plant over an eighteen-month period. At least two pre-production aircraft were expected to be ready as early as July. The production plan called for a peak output by January 1942, terminating with a final batch of 42 aircraft in December of the same year. Continued testing throughout this whole production phase confirmed almost no faults or problems, making the transition from *Bertha* to *Dora* one of the smoothest upgrades ever attained, apart from the undercarriage.

The redesign had extended to the undercarriage of course, which was reinforced to cope with the upgraded laden and empty weight of the new *Stuka*. Even here some streamlining was incorporated, with thinner leggings and leather banding to shield the oleo shock absorbers. However, during testing in October 1941, an undercarriage collapsed on landing, killing both aircrew and, later, further complaints began to be received from the field. It was discovered that the upper fork sheared off first,

a fault unknown in the *Bertha*. Long-term examination was initiated and a re-working with great rigidity was introduced to the production line. However due to the overriding need to get the new *Stuka* to the front and, in order to find a short-term solution, all the early-build *Dora* 1s had their undercarriages replaced by Espenlaub at Wuppertal with the old-type *Bertha* 2 gear. This 'fix' caused the retrograde step of forcing some restrictions on bomb loads. In addition, the design called for a jettisonable undercarriage, but the explosive device to trigger this needed a great deal of re-jigging before it became properly efficient.

Apart from this vexing problem, which negated much of the improvement undertaken, testing of the *Dora*, most of which was conducted by the *Erganzungsstaffel* (Replacement Training Unit) based at Schweinfurt, went well. Take-offs, landings, dive-testing, ordnance release, lift and changes, were all reported as acceptable. Later, in the summer of 1943, a minor problem was encountered in the field with aileron flutter vibration during steep dives as the speed built up to 500 kph. Post-war commentators have stated that – as a result – the *Stukas* were not carrying out dive-bombing missions at this time, but this is certainly not true, and the RLM was concerned enough to authorise a thorough examination into the problem at Dessau. New aileron hinges were fitted as a result of these investigations, which cured the problem as dive speeds of up to 650 kph caused no flutter. These new hinges could be retrofitted in the field. As the war progressed, a large number of variants to the basic *Dora* 1 design were evolved as circumstances changed.

Dora 1

The Jumo 211 J1, which drove the Junkers VS 11 airscrew, resulted in an official maximum speed of 408 kph and the classic *Stuka* form was re-designed to be lengthened to accommodate this power-plant. The distinctive knuckle forward of the cockpit vanished with a smooth line down the cowl to the spinner. The new streamlined supercharger air intake remained on the starboard side, but was moved further forward and, being of a lower-profile, was blended into the line, and had a hinged mouth inlet flap. The two Glycol coolant system radiators were relocated to one under each half of the centre section of the wing, close inboard. The chin oil cooler intake for the Intava 100 oil, as well as being much shallower in depth, was fitted with five offset shutters which could seal the aperture and which were operated by an actuator rod over one third of its width, with the rest meshed with fixed filter bands. The under-wing radiator inlets were oblong and similarly equipped with fully hinged rear outlets just ahead of the trailing edge.

Flame-dampers for night-attack missions was another option, following successful missions in both the Thames Estuary (against British coastal convoys) and in the Mediterranean (against the ships supplying Tobruk). Finally, there was also a glider tug role capability, with a tail-box, which could either be factory-fitted or welded on in the field, into which a towing cable could be attached. Gliders as large as the DFS 230 could be towed without difficulty, but its main usage was the transporting of a unit's own spare parts and equipment from one base to another. Friedrich Lang, the former *Gruppenkommandeur* of III./St.G 1, gave the author this account of one such occasion:

As is clear from this view of a Ju 87 D (Trop) still in factory markings in the winter of 1942/43, some aircraft were factory finished with overall tan uppersurfaces. It is thought, however, that such a camouflage was by then inappropriate for conditions in Tunisia, and that the very few aircraft that reached St.G 3 in this scheme were modified with the addition of green areas.



1939-1941



A close up view of the canopy of a Ju 87 D, almost certainly of II./St.G 3, showing the pilot and gunner in their positions, although the latter lacks armament; only the sights for his MG 81Z are in place. The stencilling on the aerial mast reads 'Vorsicht-Nicht Anfassen': 'Caution – do not touch'.



The instrument panel in a Ju 87 D.



A close up of the twin rear firing MG 81Z machine guns in the rear cockpit of a Ju 87 D.

"The Ju 87s allocated for towing were fitted with a new hook arrangement and a simple lever release. I was given the far from easy task of leading the towing formation, a Schleppverband, which consisted of fifteen Ju 87s, each with

a glider in tow, from Graz via Brünn, Krakow, Lemberg, Schitomir, Konotop to the airfield at Ochotschewka, north-east of Kursk, from where we then started the June offensive towards Woronesch. The Lastensegler (gliders) were not altogether successful. Too many of them came adrift while being towed and lay somewhere in the countryside with their loads inside them. Recovery was time-consuming and very difficult."⁶

The double cockpit and canopy was completely redesigned to fit in with both the new profile and new defensive armament and enhanced protection, becoming aerodynamically both smoother and flowing. The reduced accommodation profile aft gave a more restricted view, and this was further limited by the introduction of armoured visors for protection of both the pilot and the exposed 'back-seater'. The extra armour, both external and internal, much reduced the hitherto exemplary vision enjoyed by the aircrew, with the armour framing extending over the lower sides of the forward cockpit, and down across the top and sides after, leaving just a sloping 'inverted 'T' shaped' viewing area for the rear gunner. The pilot had a much larger seat-mounted armoured headrest, and both the cockpit floor and the overturn structure were armoured also.

An increased range was facilitated by the fitting of larger capacity internal flexible rubber wing tanks, which brought capacity up to 780 litres. Two underwing mounted 300 kg drop tanks further extended this to 1,370 litres, to give four hours flying time. Although the standard radio fitted remained the FuG VIIc radio with an EiV 1a intercom, an additional FuG 25 transponder was incorporated.

⁶ Friedrich Lang to the author, 16 December 1976.

Communications were further enhanced with the fitting of a new standard homing set, with the *Peil Gerät IV D/F*, relocated from its former position beneath the fuselage to run under the top of the after fuselage, fore-and-aft along a shallow well set in the after fuselage, beneath a round, flush-fitting Plexiglas dome. The radio antenna was slightly increased in height to compensate for a small addition in height of the vertical tail.

The main defensive armament alteration

under the rear canopy was the fitting of the *Gleitschienenlafette* GSL-K 81 armoured gunner's 'citadel'. The emplaced weapon was the re-designed Mauser 7.92 mm

MG 81Z *Zwilling* (twin) machine-gun, which was 475 mm long. It had a rate of fire of 3,000 rpm and was equipped with twin, offset VE22 B sights⁷. These weapons had an elevation range from the horizontal of +80 degrees to -15 degrees and each barrel was fitted with air-cooler sleeves. The ammunition was belt-fed with supply issuing from two metal lockers set one to port and one to starboard, each holding 2,000 rounds, with the ejected spent cartridges being held in a leather bag strung between them.

Wing-mounted, forward-firing capability was similarly enhanced with the introduction of the short-barrelled *Mauserwerk* MG 181Z, which had a rate of fire of 3,200 rpm, to port and starboard. The ammunition boxes for these weapons held 500 rpg. The pilot fired them using the Revi C/12C or D reflector

sight, via the EPAD 17 trigger and loading device. These were later steadily replaced by the long-barrelled 20 mm MG 151 for tank-busting.

As well as the small increase in the tail fin vertical dimension, the only difference in the *Dora's* empennage against the *Bertha* was the replacement of the twin 'V' tailplane braces with a simple single aerofoil brace. The undercarriage remained basically the same but was strengthened to cope with the extra weight and the new bomb loads. Larger, 840 x 300mm tyres, were fitted to further so assist.

Enhanced payload

The introduction of new weaponry gave the new *Stuka* a much-enhanced offensive capability, so vital for the Eastern Front. The main targets were the tough Soviet tanks, now being encountered in ever-increasing numbers, and the massed infantry, of which the Russians seemingly had an inexhaustible supply and apparently no qualms in sacrificing them. The ability to switch ordnance very quickly to meet rapidly changing combat scenarios, and to be able to do so under the most primitive conditions imaginable, led to considerable re-thinking.

In order for the *Dora* to accommodate the enlarged weaponry now being introduced, the old extendable bomb crutch, of fixed dimensions, was replaced by the *Schloss* 500/XII C bomb release slip, a more flexible swing-trapeze device with a retaining strap. With this device, the spacing gap between the retaining lugs could be widened far enough to hold larger bombs, and the *Schloss* 2000/XIII could hold bombs of the maximum dimension and weight of the 1,700 kg PC 1800.

Underwing capacity was also enhanced. Three-sectioned aerodynamic fairings were mounted over the general-purpose electrical-release ETC 50 VIII e bomb racks. These could carry three new types of container, in conjunction with the *Schloss* apparatus. The wooden AB 250 and AB 500 containers were capable of being loaded with mixed ordnance for use against massed troops or unarmoured vehicles and artillery, normally whole loads or combinations of SD-2, SD-4 or incendiaries. The AD 250 dispenser had a capacity of 225 1 kg SD1 fragmentation bombs or seventeen 10 kg SD 10 A bomblets, or 144 SD 2s with one or two-second time-delay fusing.



Another view of the twin rear firing MG 81Z machine guns, with the gunner peering through the uniquely shaped internal armour, known as the *Gleitschienenlafette* GSL-K 'citadel'. This was introduced in the Ju 87 D along with the reprofiled canopy.



A close up of the short-barrelled *Mauserwerk* MG 181 in the wing of a Ju 87 D.

⁷ Later replaced by firstly the VE 23 and then, in the D-5 model, by the VE 42 sight, which was combined with a deflection measurement extension device.



During the Soviet attacks which penetrated the boundary between Army Group North and Army Group Centre in February 1942, Ju 87 Ds of III./St.G 1 and I./St.G 2 flew successful missions against enemy armour, anti-aircraft positions, railways, trains, bridges and pillboxes. These missions were accomplished despite operating conditions typical of those depicted in these scenes.

Also mounted below the wings were the WB (*Waffenbehälter*) 81A and B gun pods. These mounted three twinned pairs of MG 81 Z machine-guns, with 250 rpg, which were fixed to fire either downward or downward at an angle of 15 degrees. Strafing of massed infantry formations was thus simplified and the *Stuka* crews dubbed them 'Watering Cans.'

There were also large, cylindrical container pods, which could be loaded with anything from stores, supplies, weapons, food, clothing, spare parts etc for improvised transportation when shifting bases. Finally, the *Dora* could mount smoke and/or flare dischargers from these fairings for even great flexibility. The *Stuka* was still very much a dive-bomber, but now it had added versatility as an all-round close-support weapons platform.

Into Battle

Thus it was that the first operational *Stuka* unit to re-equip with the *Dora*, I./St.G 2 under *Hauptmann* Bruno Dilley, had commenced operations with the type in Russia by January 1942.

Each of the Eastern Front *Stukageschwader* were withdrawn in turn to so refit before returning to the fray; commencing with the St.G 2, then St.G.1 and finally, from March, St.G.77, with 6. *Staffel* taking delivery at its home base of Böblingen, the others following by the end of May. Dilley first took the *Dora* into battle in the east before Leningrad in January, his *Gruppe* becoming heavily involved in stemming the onslaught of Soviet armour during a great counter-assault on the northern front.

The Phasing in of the Ju 87 *Dora* – 1942

Unit	Replaced Type	Base	Date
Stab/St.G. 1	<i>Richard</i>	Schwäbisch-Halle	January 1942
I./St.G.1	<i>Richard</i>	Kitzingen	June 1943
II./St.G. 1	<i>Richard</i>	Schwäbisch-Halle	January 1942
III./St.G. 1	<i>Richard</i>	Schweinfurt	January 1942
Erg./St. G 1	<i>Richard</i>	Schweinfurt	January 1942
Stab./St.G. 2	<i>Bertha</i>	Graz	May 1942
I./St.G.2	<i>Bertha</i>	Echterdingen	February 1942
II./St.G. 2	<i>Richard</i>	Neukuhren	February 1942
III./St.G.2	<i>Richard</i>	Markersdorf	May 1942
Erg./St.G 2	<i>Bertha/Richard</i>	Graz-Thalerhof	October 1941
Stab/St.G 3	<i>Richard</i>	Gambut	November 1942
I./St.G 3	<i>Richard</i>	Trapani	August 1942
II./St.G 3	<i>Richard</i>	Martuba	April 1942
III./St.G 3	<i>Richard</i>	San Pancrazio	November 1942
Erg./St. G 3	<i>Richard</i>	Saloniki-Sedes	November 1942
Stab./St.G.77	<i>Bertha/Bf.110</i>	Kharkov-Nord	April 1943
I./St.G. 77	<i>Bertha/Richard</i>	Boblingen	April 1942
II./St.G.77	<i>Bertha/Richard</i>	Rostov	July 1942
III./St.G.77	<i>Bertha/Richard</i>	Würzburg	February 1943
Erg./St.G.77	<i>Bertha/Richard</i>	Sarabus	July 1943

Simultaneously, the D-1 also began to appear in the Mediterranean theatre of war with III./St.G.3, under *Major* Walter Enneccerus, which re-equipped with them at San Pancrazio in Sicily. They were first used in the renewed assault on Malta, which followed.

In all, some 592 of the new dive-bombers rolled out of the Junkers works in 1942 and every one of them was badly needed. Although most of the faults had now been ironed out, the *Stuka* still had to face the greatest extremes of weather and continue operating. From temperatures as incredibly low as -45 degrees on the Baltic front, to the searing heat of the Libyan desert, the ubiquitous Ju 87, along with its air- and ground crews, was expected to cope with equal effectiveness and capability.

Ju 87 unit Order of Battle

14 March 1942

Luftflotten 1, 4 and VIII. Fliegerkorps

II.Gruppe/St.G 1	Ju 87	18	(5)
III.Gruppe/St.G 1	Ju 87	20	(14)
Stab/St.G 2	Ju 87, Bf 110	11	(2)
I.Gruppe/St.G 2	Ju 87	30	(16)
4.Staffel/St.G 2	Ju 87	11	(5)
III.Gruppe/St.G 2	Ju 87	18	(4)
I.Gruppe/St.G 5	Ju 87	31	(23)
Stab/St.G 77	Ju 87, Bf 110	7	(1)
I.Gruppe/St.G 77	Ju 87	30	(15)
II.Gruppe/St.G 77	Ju 87	25	(10)
III.Gruppe/St.G 77	Ju 87	32	(13)

Luftflotte 3

No *Stuka* units

Below and right:
Additional pictures of
Ju 87 Ds of III./St.G 1
and I./St.G 2 during the
Soviet attacks in
February 1942.

Luftflotte 5

No *Stuka* units



A Ju 87 B or R of a
Stukageschwader in
Russia during the
winter of 1941/42.



A Ju 87 D-3 of 4./St.G 77 taxis through the mud in the autumn of 1942. Note how the propeller wash has thrown up a fine spray of mud which, together with further deposits from the engine exhausts, has discoloured the lower fuselage.

Although the style of the numeral 2 in the operational code is slightly different from that shown in the photograph (681), the operational markings S2+NM would suggest that the machine nearest the camera in this view of a formation returning from a mission on the Eastern Front is the same Ju 87 D-3 above.



Junkers Ju 87 D-3 of 4./St.G 77, Russia, 1942

Although finished in a standard 70/71 splinter scheme with 65 undersurfaces, the exposed undercarriage gives this machine a certain individuality. Although the siren fairings remained in position, no propellers were fitted and the devices were capped off. As noted above, the presentation of the operational lettering on each side of the fuselage differed slightly.



Above: The I./St.G 2 received its first Ju 87s late in 1941, and this winter-painted example, T6+DK of 2./St.G 2, was photographed in early 1942.



Left: The Staffel letter L on this Ju 87, possibly a B-1, shows that the code was applied when the aircraft flew with 3./St.G 186. This code was retained when this Gruppe was redesignated III./St.G 1 in July 1940, and J9+LL is shown here in Russia in late 1941 or early 1942. Note the temporary nature of the white winter finish is shown by the erosion around the wing root and even around the handholds in the fuselage.

Ju 87 Bs of St.G 77 in Russia, the machine in the foreground clearly showing the main S2 code allocated to this Geschwader. Some parts of St.G 77 were still operating the Ju 87 B as late as March 1943.





A Ju 87 R flying high over Malta. Although the Ju 87 units II. and III./St.G 1 and I./St.G 2 were ordered to Italy for operations against this island garrison, the situation on the Russian Front in January 1942 demanded that they be retained in that theatre to meet the Soviet counter-attack. Malta was subjected to heavy bombing raids in various phases during 1941 and 1942, these reaching their climax on 21 April 1942.

Blitz on Malta – 1942

At the end of March 1942, *Luftflotte 2*, commanded by *Generalfeldmarschall* Albert Kesselring, had moved from the central Russian Front and assumed responsibility for air operations in the central Mediterranean area – from Cagliari in Sardinia in the west, to Rhodes in the east, and from Rome in the North, to Libya in the south. The *Luftflotte* was assigned X. *Fliegerkorps* (with headquarters in Athens), and brought with it II. *Fliegerkorps*, under *General der Flieger* Bruno Loerzer, which was based on Sicily. The whole *Luftwaffe* position had, in fact, been reinforced in readiness for the planned airborne neutralisation of Malta as a naval and air base, prior to Operation *Hercules* – its much-delayed aerial invasion and occupation. This occupation, which was to take place in August, would, it was believed by Hitler and Mussolini, end the pressure on Rommel's supply routes to North Africa once and for all, and speed his final push on Cairo. Some 425 German aircraft were on hand to carry out this plan, aided by whatever the *Regia Aeronautica* could muster to add to the total.

The attacks on the island, particularly the harbour and airfields, had gradually increased in tempo from January 1942 onward, and reached a crescendo in March-April, with 300 sorties flown on 21 March rising to 325 on 20 April. However, surprising as it would appear, the *Stuka* contribution to this second 'Malta Blitz', was relatively small and really only consisted of *Hauptmann* Kurt Walters' III./St.G 3, having re-equipped with the *Dora* from the *Richard* and based at Trapani, but never more than thirty strong, of which some two-dozen were usually combat-ready.

Few or not, the *Stukas* did leave their mark. The destroyer *Legion* had been damaged by a 15-inch shell during the Battle of Sirte and took refuge in Valetta harbour. She was secured alongside the Boiler-House Wharf, inboard of the cruiser *Penelope*, her own sister destroyer, *Lance* and the submarine *Pandora*. Attacks on this tempting target were continuous during daylight hours, but *Legion's* luck finally ran out on the late afternoon of 25 March. Three attacks had been made by Ju 88s without result, but the final attack of the day was delivered by an estimated twenty Ju 87s, which were reported to have released their 500 kg bombs from heights of between 600 and 900 metres or lower. Two – some reports say three – direct hits were made on the *Legion's* fo'c'sle and on 'B' gun deck, and these bombs passed on down through the lower mess decks before they detonated with a huge impact. To add to the carnage, a fourth bomb was a near miss, which landed on the jetty alongside the ship. The destroyer was split right open and quickly sank by the bow, heeling over to port and going down in five minutes in shallow water. The *Lance* lasted a few days longer then suffered the same fate. Her commanding officer, Lieutenant-Commander Geoffrey Style, told the author:

"In the first raid in which Lance was hit, I remember we three officers left on board had just rushed to see whether we could send aid to the submarine moored next to us which had been hit and was sinking. As we reached the deck we could at once tell we were for it and almost immediately the bombs struck."

A similar view of two further Ju 87 D-1s of I./St.G 2. All Staffeln of this Gruppe had a Scottish terrier as a badge, as shown on the machine of 1. Staffel in the foreground, when it was on a white disc, but while 3. Staffel had a similar badge on a yellow disc, it also had an alternative which featured the coat of arms of the city of Breslau. This alternative badge is shown on the aircraft in the background.



*"It was 1430 in the afternoon when we were hit and after the concussion I can remember little other than falling to the deck and seeing my left arm severed below the elbow in front of me. I also had splinters through my thigh and chest. Lieutenant Dallas-Smith had his leg badly shattered and eventually amputated and Chief Engineer King was wounded in the seat."*⁸

Lance was moved into No. 2 dock but another dive-bombing attack on 5 April resulted in another near miss, which blew her off the stocks, and she was partially submerged. Repairs got underway between air raids, but on 9 April, two more very near misses wrecked her and she was a total loss.

Battles in the Snow

The plans had been for many more *Stukas* to join the *Stukageschwader* in the Mediterranean, but the terrible situation that had developed on the Eastern Front from the loss of Rostov-on-Don in November 1941, followed by the Soviet counter-offensive threatening both Kharkov and Kursk, coupled with the appalling weather conditions which reduced serviceability levels to a mere 30 per cent, all such ideas were hastily abandoned, as Friedrich Lang recalled:

*"I./St.G 2, which belonged to VIII. Fliegerkorps, was transferred in November 1941 to Böblingen, near Stuttgart. We had desert camouflage painted on our Ju 87s and we were fitted out for Africa. At the beginning of January we received orders to cancel everything and respray our Stukas white and transfer in the quickest possible way, group by group, to Dno (between Pleskau and Ilensee [the German name for Lake Ilmen] as the position at Wolchow and around Demjansk was becoming disastrous. In the transfer 3.Staffel lost two or three planes in a snow storm near Elbing."*⁹

Hitler ordered his troops to stand firm, but that was easier said than done. Many of the *Stuka* units withdrawn to re-equip shared I./St.G 2's experience and were rushed back to the front, which, with the coming of the thaw in April 1942, eventually was stabilised. By this time *Stab./St.G 1* under *Oberstleutnant* Walter Hagen, found itself at Orel-Nord with *Major* Peter Grassmann's III./St.G 1 while II./St.G 1 under *Major* Alfred Druschel, was working from Kharkov. Similarly, St.G 2 '*Immelmann*' led by *Oberstleutnant* Paul-Werner Hozzel had its *Stab* based at Vyazma, along with *Major* Gustav Pressler's III./St.G 2, while the I./St.G 2, led by *Hauptmann* Otto Weiss was at Dno and II./St.G 2 was working out of Wels.

Finally, far to the south, that same April found *Stab./St.G 77* under *Major* Clemens Graf von Schönborn-Wiesentheid at Sarabus-Süd, near Simferopol, where they it was conveniently close to the Headquarters of 11. *Armee* under *General* Fritz von Manstein, preparing to take the fortress at Sevastopol. Here were also gathered the entire *Geschwader* – I. *Gruppe* commanded by *Hauptmann* Helmut Bruck, II. *Gruppe* under *Major* Kurt Huhn and III. *Gruppe*, led by *Hauptmann* Helmuth Bode.

Meanwhile, in the blazing heat of the North African sun, a different kind of war was being fought by the *Stukas*, but no less fiercely.

⁸. Lieutenant-Commander G. W. Style, RN, to the author 18 March 1975.

⁹. Friedrich Lang to the author, 16 December 1976.



A Ju 87 D-5 landing on a reasonably well-appointed airfield. The fuselage code L1+UD is an anomaly, since the last letter, D, was used by III./SG 1, but with the Geschwader code J9. It is thought, therefore, that as with the camouflage, the operational markings on this machine were still unfinished and not fully amended following the redesignation of I./St.G 5 to III./St.G 1, and subsequently III./SG 1. The Bf 109s of the fighter escort may be seen touching down in the background.



Junkers Ju 87 D-5, of III./SG 1, Winter 1943/44

On this machine, the aircraft painters have managed to change the last letter of the operational markings to a D and spray the main parts of the winter finish, but have stopped well clear of the national markings and fuselage lettering which were roughly blocked out by brush. This resulted some areas of the original 70/71 splinter pattern remaining but which were probably more neatly filled in later, with the being white continued to the borders of the fuselage markings. The demarcation lines on the lower engine cowlings and wheel fairings also probably indicate areas yet to be properly finished.

The background colour of the badge on this Ju 87 D3 is believed to be red, indicating that it also belonged to the 2. Staffel of Stukageschwader 2. It is thought that this photograph, showing an aircraft still with traces of its winter camouflage, particularly on the outer areas of the wings, was taken in the spring of 1942. The white winter scheme was often allowed to erode naturally, rather than being removed, as it proved an ideal finish when the snows began to thaw. Note the name 'Heinrich' painted on the engine cowling, possibly originating from the individual aircraft letter H, in which case the aircraft would have been coded T6+HK.



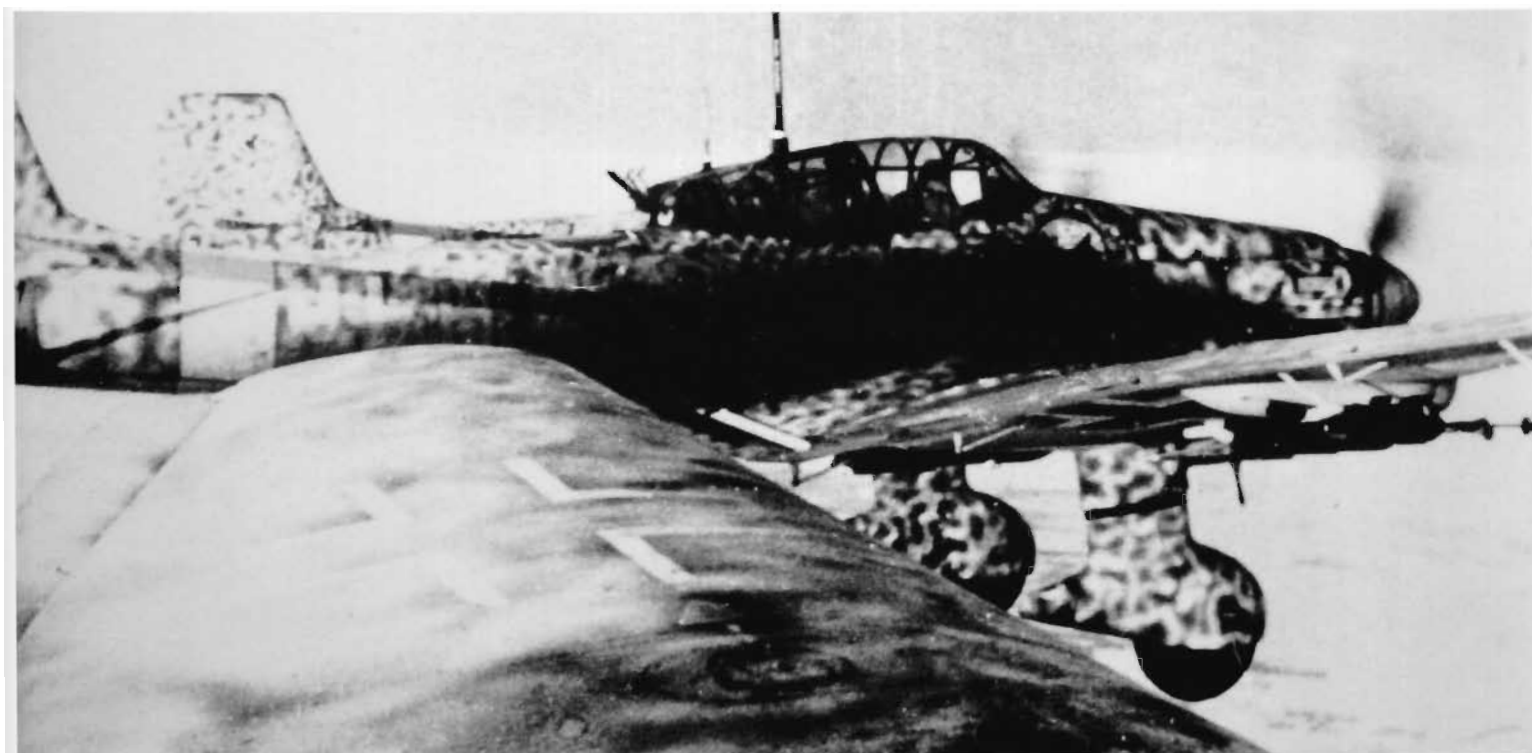
Below: A ground crewman climbs up onto the port wing of a Ju 87 D-5 as it taxis in after a mission over the Eastern front. Note the extended bomb cradle and the wing mounted MG 151 cannon which replaced the earlier MG 17 mm machine guns. The fitting of the cannon in the wings indicated a change in the role of the Ju 87 from not only a dive bomber, but to ground-attack.



Above: The III./St.G 1 began converting to the Ju 87 D at Schweinfurt during late 1941 and returned to the front in February 1942 when it was stationed at Gostkino, SSW of Leningrad, in northern Russia. This photograph shows Ju 87 Ds of 7./St.G 1 over a snowy landscape in early 1942. Note that the leading two aircraft have had the rear parts of their undercarriage fairings painted yellow.



Left: Groundcrew wind up the inertia starter of a Ju 87 D-5, possibly of 1./SG. 3 in January of 1944. Based at Dorpat in Estonia the unit was transferred from the southern sector of the front to the northern sector due to battle fatigue.



Ju 87 unit Order of Battle

10 May 1942

Luftflotte 2

II.Fliegerkorps

III.Gruppe/St.G 3	Ju 87	San Pietro, Sicily	23	(10)
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Fliegerführer Afrika

Stab/St.G 3	Bf 110, He 111	Derna Süd, Libya	2	(0)
I.Gruppe/St.G 3	Ju 87	Derna Süd, Libya	41	(23)

Luftflotte 3

No Stuka units

Luftflotte 4

Stab/St.G 77	Ju 87, Bf 110	8	(4)
I.Gruppe/St.G 77	Ju 87	38	(13)
II.Gruppe/St.G 77	Ju 87	27	(17)
III.Gruppe/St.G 77	Ju 87	33	(21)

Luftflotte 5

No Stuka units

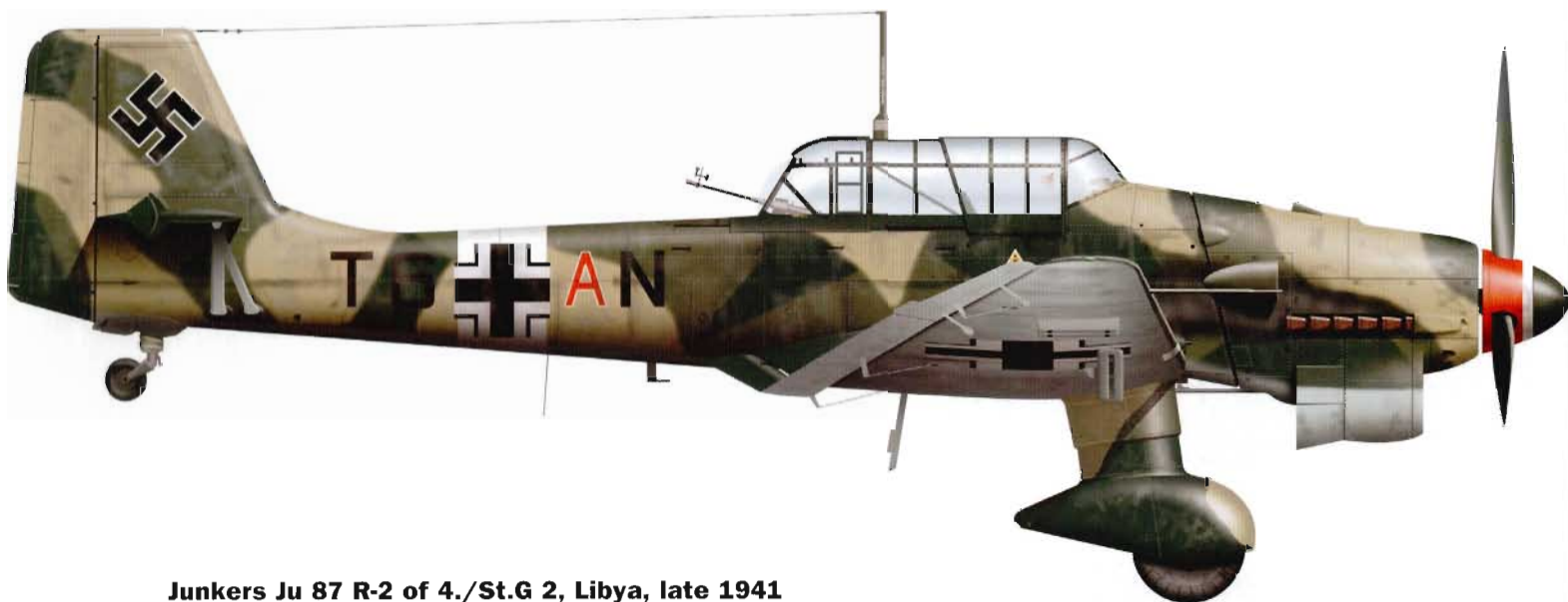
Luftflotte Ost

Stab/St.G 1	Ju 87, Bf 110	10	(4)
I.Gruppe/St.G 1	Ju 87	32	(23)
II.Gruppe/St.G 1	Ju 87	54	(35)
III.Gruppe/St.G 1	Ju 87	46	(26)

A close formation of Ju 87 D-1s of I./St.G 2 in early 1942. The camouflage consists of a Wellenmuster type of winter scheme in which the white paint was applied in the form of an almost continuous wavy line. Note that the undercarriage fairings on early Ds were similar to the B series and lacked the later leather gaiters.



Two Ju 87 R-2s of St.G 2 being inspected by British or Commonwealth troops in North Africa in 1941. Both aircraft have been camouflaged with tan stripes over the original green 70/71 splinter finish, this being shown clearly (left) in the areas not overpainted with tan. The machine (above) coded T6+AN (718) belonged to 5./St.G 2.



Junkers Ju 87 R-2 of 4./St.G 2, Libya, late 1941

This aircraft is an example of how the standard 70/71 splinter scheme on the upper surfaces was modified to suit desert conditions, in this case by the application of random tan stripes to give a disruptive effect. Undersurfaces were in 65.



Luftwaffe mechanics servicing a Ju 87 R-2 in 1942. Note that although the machine carries the S7 code of St.G 3 on the fuselage, the diving raven badge of I./St.G 1 continued to be applied to the cowl and, indeed, was taken over by II./St.G 3. The triangular component by the mainwheel is the window from the floor of the pilot's cockpit.



This aircraft, believed to be a Ju 87 D-1 Trop, was shot down by an Allied fighter on 1 November 1942. The machine, W.Nr. 2396, carried the operational code S7+KS of 8./St.G 3, and both members of the crew, Uffz. Otto Eckhardt and Uffz. Herbert Wagner, were captured wounded. Of particular interest is the contrast between the black of the upper wing Balkenkreuz and the 70/71 splinter camouflage that illustrates the astonishing degree to which the uppersurface colours had faded.





This Ju 87 R-2 coded S1+AM was flown by the Staffelführer of 4./St.G 3. The long range tanks and the lack of a gunner/wireless operator suggests the machine was on a ferry flight when photographed.



Junkers Ju 87 R-2 of 4./St.G 3, early 1942

This Ju 87 R-2 was finished in the standard splinter pattern camouflage of 70/71 uppersurfaces with 65 undersurfaces. A white theatre band was painted around the rear fuselage and the individual aircraft letter A was repeated under each wingtip. The yellow on the rear of the undercarriage fairing is consistent with a formation leader's aircraft.



A Ju 87 D-3 of 6./St.G 3 based at El Aouina, Tunisia in November of 1942. Though operating in North Africa the aircraft has retained its European camouflage of RLM 70/71 on the upper surfaces and RLM 65 beneath.

War in the Desert 1942 – Advance

The fluctuating fortunes and strength of St.G 3 in the desert campaign that ebbed and flowed along the coast of Egypt and Libya can be illustrated as follows:

Date	Unit	Location	Establishment	Serviceable
27.12.1941	I./St.G 1	Libya	32	17
27.12.1941	Stab/St.G 3	Derna & Benina	9	5
27.12.1941	I./St.G 3	Derna	30	18
17.01.1942	Stab/St.G 3	Agedabia	4	2
17.01.1942	I./St.G 3	Agedabia	24	23
17.01.1942	II./St.G 3	Agedabia	29	20
17.01.1942	Erg./St.G 1	Libya/Egypt	12	8
04.04.1942	Stab/St.G 3	Barce	5	4
04.04.1942	I./St.G 3	Martuba	32	16
04.04.1942	II./St.G 3	Martuba	8	0
10.05.1942	Stab/St.G 3	Ain-el-Gazala	2	0
10.05.1942	I./St.G 3	Ain-el-Gazala	41	28
10.05.1942	III./St.G 3	San Pietro	23	10
10.06.1942	Stab/St.G 3	Tmimi	3	2
10.06.1942	I./St.G 3	Tmimi	30	16
10.06.1942	II./St.G 3	Tmimi	30	17
10.06.1942	III./St.G 3	Tmimi	26	13
20.08.1942	Stab/St.G 3	Bir el Abd	7	3
20.08.1942	I./St.G 3	Trapani	28	20
20.08.1942	II./St.G 3	Bir el Abd	36	21
20.08.1942	III./St.G 3	Bir el Abd	36	30

The British winter offensive into Libya reached its peak in December 1941 with the capture of Benghazi. However, with his fuel and supplies now getting through following the destruction or damage of most of the British warships based at Malta, Rommel was able to build up his strength for the inevitable *riposte*, and it was not long in coming. On the 19th January 1942, the *Afrika Korps* made a sudden thrust from El Agheila, which was heavily supported by St.G 3, some 250 sorties being flown in support of the ground forces on the 21st and 22nd respectively. This ensured the re-capture of the vital supply port of Benghazi and Rommel then moved on to El Gazala before running out of steam.

A three-month hiatus followed while both sides sought to recoup and reinforcements, including forty *Stukas* were moved from Sicily back to the desert in readiness. On 26 May, the Germans moved out again, with the *Stukas* mounting one hundred sorties per day during the first week of operations. The battle developed in a confused tank contest around the area south of the fortress of Bir Hacheim that the British called sardonically 'Knightsbridge', which Rommel ultimately won. The fortress itself was

held by a Free French garrison and was a very strong anchor position to the south. However, the whole *Stuka* force was concentrated on this target, and maintained a high-level of precision attacks for a period of nine days. In all some 1,400 sorties were flown and the French were ultimately forced to abandon Bir Hacheim on 10 June, thus opening the way for the next German objective, Tobruk itself.

The Fall of Tobruk

On 16 June, the *Afrika Korps* – in a series of hammer blows – overran El Adem, Belhamed and Acroma, smashed the British 4th Armoured Brigade at Sidi Rezegh on the 17th and two days later had surrounded Tobruk once more. Tobruk in June 1942 was held by 35,000 Allied troops including fourteen battalions of infantry, including the Guards Brigade and the Gurkhas, and the 32nd Tank Brigade, along with five regiments of field artillery and seventy anti-tank guns. Its flak defences had been boasting for months on their effectiveness against the *Stuka*. All this counted for naught when, on 20 June, the *Doras* of St.G 3 commenced a pulverising attack on the 11th Infantry Brigade at the south-eastern side of the defence perimeter. The RAF had pulled back so far that Tobruk was beyond fighter cover so the *Stukas* were allowed to go about their work methodically. There were more than 350 dive-bomber and fighter sorties flown by the Germans during this period. By the 21st the defending General, the South African Hendrik Klopper, capitulated and 33,000 prisoners were taken along with 10,000 cubic metres of invaluable petrol and three months rations.

The speed and totality of the defeat amazed and humiliated Churchill, who had been confident the garrison would hold out as it had done the year before. But it also surprised many of the British defenders on the spot. Captain J E Jenkins of the Royal Engineers, wrote in his diary how:

"Although we knew that we were completely cut off from our main force, everyone had complete faith in Tobruk's capabilities of holding out, so that when the dive-bombers appeared early in the morning were not surprised or perturbed." He estimated the number of Ju 87s as thirty in the first wave, which coincided with an attack by infantry. *"The bombers included smoke among their load and also some 1000 kg bombs. The Battalion HQ had received a direct hit and communications were cut."* This proved to be the deciding blow. *"Our OC ordered vehicles to be burnt and it was pitiful to see all our comparatively new trucks ablaze. We were finally captured about 1600 hrs."*¹⁰

Not content with this unexpected coup, Rommel, suddenly a *Generalfeldmarschall* thanks to a delighted *Führer*, (but against the sage wisdom of Kesselring who feared over-stretch of his limited resources and called it "foolhardy"), pushed home his advantage against the disintegrating British Army who were in pell-mell flight back to the Egyptian border and beyond. The only reason this mass of men and material escaped total destruction at the hands of the *Luftwaffe* was that the *Stukas* were diverted instead to attack Malta Convoy *Vigorous* which was then proceeding through the eastern Mediterranean. The Germans meanwhile crossed into Egypt and then moved rapidly east, opening proceedings at 1730 on 27 June with an attack by twenty-six Ju.87s against the positions of the 2nd New Zealand Division, some 15 kilometres south of Minquar Qaim. This force was enveloped and had to fight its way out, so Mersa Matruh fell and the British withdrew a further one hundred miles to El Alamein, the last line of defence before Cairo and the Suez Canal.

By 20 August, the *Fliegerführer Afrika*, General der Flieger Otto Hoffmann von Waldau, had been replaced by *Generalmajor* Hans Seidemann, but even his overall strength was still pitifully low, just 266 aircraft of which only 160 were fully operational, including St.G 3 now working from Qasaba. Attempts by Rommel on 31 August to break through the British defences between Taqa and Bab el Qattara with minimum support ultimately failed. The line stagnated until October, which gave the British time to build up an overwhelming strength for the final counter-attack.

Against the Malta Convoys

The supply convoys fought through to prevent Malta from starving, faced ever-increasing opposition during 1942, and eventually the passage of each convoy became a full-scale air/sea battle contested with enormous ferocity. Whichever route the British chose, either via the Straits of Gibraltar to the west, or via the Suez Canal from the east, their route took three to four days steaming, during which time they were outflanked to the north and south by hostile airfields and harbours, with only Malta itself a lone speck of friendly territory in the centre. The *Stukas*, naturally, played their full part in disputing these convoys' safe passage when not involved in the various land battles that often coincided, and

¹⁰. The Second World War Experience Centre – Events in North Africa - June 1942.

they also attacked the merchant ships that reached the island, as well as the warships based there, causing more losses and damage.

In mid-January MF.3, a small convoy of four fast merchant ships, sailed from Egypt for Malta, and its only casualty was the freighter *Thermopylae*, which had developed engine defects. She was sent into Benghazi whereupon en route on the 19th, St.G 3 found her and damaged her so much she had to be sunk. MF.3 was followed by convoy MF.5 of three merchantmen, which sailed from Alexandria on 12 February. Next day the *Stukas* so damaged the *Clan Campbell* that she had to be sent into Tobruk, while the *Rowallan Castle* was hit and sunk outright.

Again, on 20 March, convoy MW.10 of four transports left Egypt for Malta. The Italian battle fleet intervened at the Battle of Sirte, but was held off by the escort and defeated. However both the *Clan Campbell* and the fast auxiliary ship *Breconshire* were damaged and then sunk by *Stukas* off Malta, while the *Pampas* and *Talbot* were similarly damaged alongside while unloading inside the harbour. Several destroyers damaged in the naval battle of Sirte and docked at Malta to repair, were subsequently dive-bombed and destroyed while thus immobile, including the *Gallant*, *Lance*, *Legion* and *Kingston* during April.

The few supply ships that survived these British convoys were insufficient to keep the Malta garrison and populace sustained so between 12th and 16th June two large convoys were planned to simultaneously run in supplies from both east and west. The western convoy, Operation *Harpoon*, consisted of five fast transports and an oil tanker with a powerful covering force. In the western basin on 15 June, the *Stukas* proved highly accurate, scoring direct hits on *Burdwan* and *Chant* and the oil tanker *Kentucky*, all of which subsequently had to be sunk.

The eastern convoy, MW.11, under Operation *Vigorous*, proved even less successful. Comprising no fewer than eleven merchant ships, also with a powerful escort, it sailed from Alexandria. On 14 June another freighter, the *Aagtekerk*, developed engine problems, had to be sent in to Tobruk, but was attacked and sunk by St.G 3 before she got there, and the *Geschwader* also badly damaged her escorting corvette, HMS *Primula*. In dive-bombing attacks on the convoy next day, II./St.G 3 flying from Derna, hit and badly damaged the cruisers *Arethusa* and *Birmingham*, and sank the destroyers *Airedale* and *Nestor* and when the Italian fleet again sailed to intervene, the operation was abandoned, the convoy turning back.

The final epic convoy to lift the siege of Malta took place in August with Operation *Pedestal*. For this the Royal Navy committed a large covering force, with four aircraft carriers, *Indomitable*, *Victorious* and *Eagle*, accompanied by the *Furious*, with two battleships, *Nelson* and *Rodney*, seven cruisers, twenty-nine destroyers and two fleet oilers completing the escorting forces. The convoy itself consisted of thirteen big fast freighters and the tanker *Ohio*.¹¹

The I./St.G 3 led by *Gruppenkommandeur*, Major Martin Mossdorf, had been hastily transferred to Trapani airfield especially to participate in this battle and it would play a major part. Once the convoy had entered the range of the *Doras* a strong striking force of twenty-nine dive-bombers was despatched in the late afternoon of 12 August, twenty German and nine Italian *Stukas* from the 102^o *Gruppo* led by *Capitano* Antonio Cumbat. For various reasons¹², the British aircraft carrier *Indomitable* had been mistaken by the Axis throughout the battle for the American aircraft carrier *Wasp*, and it was against this target that Mossdorf's unit directed their fire and fury.

The dive-bomber assault was part of a much larger synchronised attack, with both Junkers Ju 88s making low-level bombing runs across the fleet, and Italian SM.79 and German Heinkel He 111 torpedo-bombers probing in at low level. The torpedo was always the greatest threat to larger warships so understandably the protecting cruisers that had been assigned to each carrier concentrated their fire on the low-flying SM.79 and He 111T torpedo-bombers. This left a gap in the flak defence which the *Stukas*, approaching at altitude out of the sun, quickly exploited. In addition, following their own



This photograph of a Malta convoy, taken during 11-12 August 1942, shows the intensity of the Royal Navy's anti-aircraft defences. The sailing of this convoy was known as Operation 'Pedestal' and was escorted by three aircraft carriers and other major warships. One of the carriers, HMS *Eagle*, was torpedoed and sunk by a U-boat on the 11th, and another, either *Indomitable* or *Victorious*, may be seen manoeuvring, lower left.

¹¹. For the full account of this battle see, Peter C Smith, *Pedestal; the convoy that saved Malta*, Goodall/Miller, 2002

¹². The *Indomitable* was thought to still be in the Indian Ocean; whereas the *Wasp* was known to have carried out aircraft supply missions from the western basin on at least two occasions. Due to the dire situation she had now returned to the Pacific but the Germans were unaware of this fact. The *Indomitable* also carried some Grumman Martlet fighter aircraft, which were in fact British versions of the Grumman F4F Wildcats, but the Germans thought they were the real thing.

already well-established doctrine, sections of the Italian *Doras* attacked the battleships to divert their much heavier anti-aircraft fire. Their leader gave me this eyewitness account of their assault:

"About ten minutes before coming within sight of the ships, I made a left-hand turn in accordance with the prearranged flight plan: I checked my compass. I was at an altitude of roughly 2,000 metres. Some flak exploded around me and I realised I was right over the convoy which must have moved considerably north in comparison to the spot where it had been sighted by our aerial reconnaissance. I ordered my unit to go into the dive but I went into a loop because I had gone beyond my vertical line of my selected target and in doing so ended up at the rear of the formation.

*"During my short dive we were surrounded by the outlines of shells from the anti-aircraft guns of all the warships. I dropped my load of bombs and pulled out at about 200 metres from sea level. During that critical phase Cavallo warned me 'Fighter on your tail'. I had not yet reached my line of manoeuvre before two cannon blows ripped through the two wings and a machine-gun volley reduced my right fuel tank to the appearance of a soup strainer."*¹³

In fact the battleship *Rodney* was attacked at this time by one of the Italian *Stukas*, which approached from dead ahead in a shallow dive. Captain Rivett-Carnac ordered 'starboard full rudder' and the bomb, which failed to detonate, hit the sea off the port side, abreast of 'X' 16-inch gun turret.¹⁴

In the midst of this chaos, St.G 3, armed with 500 kg semi-armour piercing bombs especially for this type of operation, delivered its attack, peeling off into its 70-degree + terminal attack dives at between 3,000 and 2,750 metres from astern the carrier and plunging down through "a smoky blue sky" to drop at about 460 down to 300 metres upon the *Indomitable*. They scored two direct hits and three very near misses, which effectively crippled the ship.

One eyewitness on the escorting anti-aircraft cruiser *Charybdis* wrote:

"I saw a group of black dots overhead. They started to peel off, one after the other in vertical dives. I realised they were Ju 87s (Stukas) and they were diving on the carrier Indomitable; although Charybdis was too far away from the Indomitable for our close-range fire to be effective I opened fire with the single port pom-pom, hoping the tracer would warn Indomitable and her closer escorts. Heavy AA fire started at once but these Stukas were the Luftwaffe's special anti-ship dive-bombers.

*"Smoke was billowing out of her hangar lifts and what I thought was the flight deck, dripping molten metal (in fact this was burning aviation fuel). The Indomitable was temporarily out of control, and Charybdis circled her ready to go alongside if need be."*¹⁵

Although *Indomitable* managed to put her fires out and returned to Gibraltar, she had to be docked and was out of the war for the next six months. After the heavy ships had turned back at the Skerki Bank the convoy with just a close escort, pushed on through the Sicilian narrows where it was ambushed by submarines and motor torpedo boats, and many escorts and transports were severely damaged and had to be sunk. The aerial battle resumed next morning against the survivors, now split into groups and continued all day. One of the principal targets was the tanker *Ohio*, and the first attack by the *Stukas* scored one very close near miss for the loss of two aircraft, one which crashed into her poop deck. At 0945 another attack by nine *Stukas* developed, three after the *Ohio* again, the rest concentrating on the *Dorset*, which was first straddled and then hit aft by a bomb which started enormous fires so that she had to be abandoned by her crew. Another attack on *Ohio* was made by five Italian *Stukas* in the late afternoon but failed to score further hits and she eventually made port with just four other merchant ships surviving. Despite the usual inflated claims of losses inflicted by both the ships' AA fire and defending carrier fighters, (which Churchill, once again, exaggerated) only six *Stukas* – four Italian¹⁶ and two German – were actually lost in this battle.

¹³ Generale B. A. Cumbat, to the author, 9 May 1977.

¹⁴ A recent account which states that one of the Italian *Stukas* was hit by AA fire and crashed on the stern of the *Rodney* is totally untrue and is, in effect, ridiculous. Even the most cursory study of the battleships' or convoys' records could have revealed this statement to have no validity whatsoever.

¹⁵ David 'Rocky' Royale, *O.H.M.S. or All in a Day's Work – H.M.S. Charybdis* (Charybdis Survivors Association, presentation copy to the Author, 1984)

¹⁶ Of the Italian losses, two, piloted by Tenente Casavola and Cremonesi were lost on the 12th and two more, piloted by Tenente's Raimondo and Savini, on the 13th, although in the latter case the crew was saved by air-sea rescue aircraft.

War in the Desert – Retreat

A particularly ill-conceived and conducted British combined attack on Tobruk, Operation *Agreement* took place on 14 September. Just about anything that could have gone wrong, did go wrong and the whole battle was a debacle from beginning to end.¹⁷ The *Stukas* contribution to this final Axis victory at the oft-disputed port was significant. Not only did they destroy several vehicles belonging to Long Range Desert Group patrols in the desert hinterland, but they were able to inflict yet further severe damage to the Royal Navy's supporting warships offshore.

Here an element of III./St.G 3, led by *Hauptmann* Siegfried Göbel, found the anti-aircraft cruiser *Coventry* off the coast, protected by no fewer than seven Beaufighters from 201 Naval Co-Operation Group. These were stacked in tiers, with two at 11,000 feet, three at 8,000 feet and two more at 1,500 feet. Weather conditions were 6-7/10ths cloud, with base under 2,000 feet and tops up to 6,000 feet. As well as deriding the *Stukas* as "sitting ducks", RAF wisdom dictated that dive-bombing was "impossible" under such conditions. Unfortunately, St.G 3 was apparently not familiar with RAF doctrine, or if it was, it did not subscribe to it, for it commenced highly accurate dives from the north at 6,000 feet. There were an estimated fifteen Ju 87s, which attacked the ships from astern, out of the sun, on a bearing of 090 degrees in succession. The commanding officer of the destroyer *Croome* wrote in his report that the British squadron and its aerial protectors: ".... was completely surprised by three formations of Junkers 87s who approached from the starboard quarter. Two of these formations made a dead set on *Coventry* and the third on *Croome*."

He also admitted that the first indication any destroyer had was of the aircraft diving and he personally did not think any ship opened fire before the first bombs fell.

These bombs were on target, the first hit destroying the RCO adjacent to the Fighter Direction Position, which put the *Coventry*'s Type 279 radar out of action. This was the first of four direct hits made on the cruiser within a few minutes. One bomb entered her forward deck just ahead of No. 1 gun, opening the forward decking down to the waterline and starting a severe fire. Two more bombs struck close together under the bridge, which demolished not just the Radar Receiving Office, but the Flag deck, SDO, the Charthouse and the bridge structure itself, then plunged on down through lower deck level, warping and twisting her hull and starting more fires amidships. Finally, a fourth bomb struck just astern of the rearmost funnel, penetrating down into her forward boiler room via the radar transmitting room, to detonate in the ammunition magazine supplying Nos 4 and 5 guns. One of *Coventry*'s midshipmen, Geoffrey David, gave the author this account of the *Stuka*'s sudden attack:

"I was sitting in the Wardroom, as we were not at Action Stations. I was just digesting the sad details of the Commander's broadcast, and hoping against hope my brother¹⁸ was safe, when there was a sudden loud bang on the deck just above me. Everyone in the wardroom looked up, startled, but before we had time to do anything more, there came the unforgettable throaty scream of a diving Stuka. My messmates leapt out of their chairs, and lay flat on the deck, and I followed their example. The first

An Allied airman posing with a dismantled Ju 87 D. This particular aircraft was allocated to the Staffelfkapitän of 7./St.G 3 and shows an interesting variation in the presentation of the operational markings, S7+AR. In this instance, the Staffel letter, R, has been painted in the Staffel colour, white, whereas the individual aircraft letter, A, which should have been white, appears to be green. This may indicate that the pilot, besides leading the 7. Staffel, was possibly also acting Gruppenkommandeur.



¹⁷ For the full and detailed account of Operation *Agreement* see, Peter C Smith, *Massacre at Tobruk*, William Kimber, London, 1987.

¹⁸ Lieutenant J. R. David, RN, who was aboard the destroyer *Sikh*, which had been sunk earlier that same day, also off Tobruk, to German shore battery fire.

RAF Technical Intelligence officers examining a Ju 87 D left behind by retreating German forces in North Africa. The work of Intelligence teams was frequently hindered by looters who removed souvenirs from Axis aircraft before they could be properly examined.



These Ju 87 fuselages were found at El Daba in November 1942. Although finished in a variety of camouflage schemes, all aircraft carry the S7 code of St.G 3. After being formed in July 1940, this Geschwader existed only as a Stab and I. Gruppe, the II. and III. Gruppen only being created in January 1942 by redesignating I./St.G 1 and II./St.G 2 respectively. The overpainted A5 code of the earlier I./St.G 1 is clearly visible on the fuselage of S7+IH, the aircraft third from the camera.





Still wearing the code A5+EL of 3./St.G 1, this Ju 87 R-2 was photographed soon after the battle of El Alamein when British and Imperial forces advanced westwards and captured the airfield at El Daba in Egypt.



Junkers Ju 87 R-2 of 3./St.G 1, El Daba, late 1942

Although 3./St.G 1 was redesignated 6./St.G 3 in January 1942, it evidently took some time before the old code was replaced. From the manner in which the green mottles have been applied, it is obvious that this aircraft was originally delivered with overall sand uppersurfaces. The green mottles were, therefore, added later, and clearly after the operational markings had been applied.

diving Stuka was followed by a number of others – I cannot remember how many – and there were several loud explosions, each of them causing the after end of the ship to whip violently up and down. After one of these I caught a glimpse through the Wardroom skylight of debris flying through the air, so I realised that one of the bombs at least had scored a direct hit. Then there was silence, and in the silence I heard the comforting rumble of the ship's turbines suddenly die away to nothing.”¹⁹

The *Croome* escaped serious damage (as her Captain admitted, only “...by the greatest good fortune”), but the *Coventry* was so badly damaged that she had to be abandoned and was sent to the bottom by the torpedoes of her own escort. Meanwhile the *Beaufighters* had finally reacted and pursued the retiring *Doras* for fifteen miles, to no avail, their crews reporting: “*The Stukas were aided in their get-away by use of cloud.*” But they soon returned, and this time their target was the destroyer *Zulu*, which joined the force as a survivor of the actual Tobruk assault. Several attacks developed, and, ironically, the very last one, delivered by St.G 3 at 1602, proved fatal. Commander White’s official report described it in detail:

“At about 1600, a concentrated attack by about six Ju 88s and twelve Ju 87s was delivered on *Zulu* and the ship was surrounded by a hail of falling bombs. The last bomb to fall hit the ship’s side, entered the engine room and burst. The engine room, No 3 boiler room and gear room were flooded and the ship settled down about two feet.”²⁰

The destroyer immediately took on a heavy list, and, although she was eventually taken under tow and got underway, she later had to be sunk. These two ships were added to the long and ever-growing list of British warship *Stuka* victims – it was a list that was destined to continue to swell.

At the time of the commencement of the El Alamein offensive on 23 October, there remained only a total of 41 *Dora*-1s of the *Stab*, I. and III./St.G 3 based at Haggag el Quasaba and Quasaba, which were just too few to affect the outcome, no matter how valiantly flown. One serious loss, on 26 October, was the *Gruppenkommandeur*, *Hauptmann* Kurt Walter, shot down as he was landing back at his base. The dive-bombers final sortie was on 27 October, when twenty D-1s, escorted by JG 27 carried out attacks. St.G 3 then had to pull back as its airfields were threatened.

By November, the *Sturzkampfgeschwader* in North Africa, under *Oberstleutnant* Walter Siegel, had only the *Stab*/St.G 3 at Gambut, and III./St.G 3, with Major Bernhard Hamester as *Gruppenkommandeur*, at Nofilia-Nord and then Bir Dufan, as still at the front, with II./St.G 3, under *Gruppenkommandeur Hauptmann* Heinrich Heine, being temporary relocated to Elmas airfield in southern Sardinia and I./St.G 3, under *Gruppenkommandeure* Major Herbert Spangenberg, at Trapani, due to the threat in the western Mediterranean posed by the Allied *Torch* landings in Vichy-controlled Morocco, Algeria and Tunisia.

Ju 87 units Order of Battle

20 September 1942

Luftflotte 2

Fliegerführer Afrika

Stab/St.G 3	Ju 87	Haggag & Quasaba	4	(3)
I.Gruppe/St.G 3	Ju 87	Haggag & Quasaba	34	(28)
II.Gruppe/St.G 3	Ju 87	Haggag & Quasaba	31	(23)
III.Gruppe/St.G 3	Ju 87	Haggag & Quasaba	32	(26)

Luftflotte 3

No Stuka units

Luftflotte 4

II.Gruppe/St.G 1	Ju 87	24	(11)
Stab/St.G 2	Ju 87, Bf 110, Fw 189	10	(4)
I.Gruppe/St.G 2	Ju 87	25	(16)
II.Gruppe/St.G 2	Ju 87	28	(13)
I.Gruppe/St.G 77	Ju 87	35	(20)

¹⁹. Geoffrey David to the author, personal correspondence, 1986.

²⁰. Report, Commander R. T. White, RN, *Loss of HMS Zulu*, 14 September 1942, contained in ADM 199 series, National Archives Kew, London.



A Ju 87 D-1 of St.G 3, the only clue to its identity being the yellow J on the wheel fairings indicating either the 3., 6. or 9 Staffel.

Luftflotte 5 Ost

No Stuka units

Luftflotte 5 West

No Stuka units

Luftflotte Ost

Stab/St.G 1	Ju 87, Bf 110	12	(5)
III.Gruppe/St.G 1	Ju 87	35	(23)
III.Gruppe/St.G 2	Ju 87	29	(25)
III.Gruppe/St.G 77	Ju 87	31	(26)

Oberbefehlshaber Mitte

No Stuka units

Arctic combat

During 1942 I./St.G 5 continued to mount dive-bombing attacks on the port of Murmansk, especially when Allied convoys arrived laden with war material and lay for days waiting to unload. On 8 April for example a sortie by fifteen *Stukas* was conducted, with an escort of Bf 110s. The defending Soviet fighters – Hurricanes and Tomahawks – claimed to have attacked this force and destroyed four German fighters and one *Stuka*, which they asserted blew up and plunged to earth (although it could do *both* simultaneously is hard to understand!). However, the immaculately maintained official returns of the *Generalquartiermeister* (Quartermaster-General) of the *Luftwaffe*, show no Ju 87 losses whatsoever this day.

Air battle at Ramushevo

A similar story was told by Soviet Marshal of Aviation Zimin about a sharp action that took place over Ramushevo on 17 June 1942, when a force of twelve Ju 87s, escorted by Bf 109s, was attacked by eight Hurricanes from Zimin's 485 IAP. He claimed the destruction of no fewer than five *Stukas* in that action, but again, *Luftwaffe* records show that just a single Ju 87 D-1 from 7./St.G 1 was lost this day, and even she was shot down by anti-aircraft fire!



Careful computer analysis of these photographs of a Ju 87 D-3 in Egypt shows the demarcation lines between the original RLM 70/71 splinter pattern on the areas not overpainted with tan, RLM 79. This particular machine was flown by Obstlt. Walter Sigel, the Kommandeur of St.G 3, and was photographed sometime between August and October 1942.



Junkers Ju 87 D-3 flown by Obstlt. Walter Sigel, Kommandeur of St.G 3, Egypt, 1942

This aircraft was finished in a predominantly European 70/71/65 scheme with the addition of two hand-painted 79 patches over the original upper surface greens on the fuselage and soft-edged sprayed areas on the wings. Being a machine of the Geschwaderstab, the tip of the spinner and the aircraft letter A are in blue RLM 24.



When the Germans still held the initiative, the function of the Ju 87s was to give direct support to the attacking spearheads, and they tended, therefore, to be switched from front to front as the German emphasis shifted. When the Germans were on the defensive, Ju 87s were used to break up Soviet attacks, either directly or by attacks on communications. Here, a Ju 87 D has attacked a coastal target and is flying out to sea in order to evade anti-aircraft fire.

The summer offensive

Rostov-on-Don was assaulted by the SS-Panzer Division *Wiking*, with heavy *Stuka* support from VIII. *Fliegerkorps*, and fell on 24 July 1942. The establishment of a bridgehead enabled the German drive to continue on toward the Kuban river, some ten kilometers north of Armavir, which was reached by 3 August. That town fell six days later. A month later, the Terek river line was reached and then crossed on 10 September and by 27th, Elkhotoovo, the 'Gateway to the Caucasus' fell after hard fighting. I./St.G 2 was to the forefront in all these victories before being pulled north for the assault on the Volga river line, at a city named Stalingrad.

Conquest of the Crimea

The German offensive of 1942 was recognition by Hitler that his initial gamble with *Barbarossa* had failed and Germany was not going to overrun the Soviet Union as easily as Western Europe. With the far from palatable knowledge that a long war was now in prospect, the next move was dictated as much by economic necessity as anything else and the oilfields of the Caucasus proved as great a lure as had the wheatfields of the Ukraine. By 16 May the Soviets had been ejected from the Kerch peninsula and that month VIII. *Fliegerkorps*, which moved south from the Moscow sector, reinforced *Luftflotte 4*.

The key to success was the Crimea and the taking of the huge fortress-city of Sevastopol, which finally fell on 1 July, marked a new high-water mark for the *Stuka* dive-bomber. This victory, moreover, had been achieved at modest cost – just thirty-one aircraft – and the fact that aircraft had to be switched to the Kharkov front. The intensity of the attack was immense, with 600 sorties a day being common, and 700 being mounted on 7 June. Although the RAF history is incredibly dismissive in its account²¹, and the battle is a largely neglected subject in the west, one important book, which gives an objective view of the whole role of the *Luftwaffe* on the Eastern Front, finally appeared in 1998²². The author, Joel Hayward, is unstinting in his assessment of the part the Junkers Ju 87 played in this outstanding achievement. Hayward maintains that *Generaloberst* Wolfram *Freiherr* von Richthofen's VIII. *Fliegerkorps* contribution to the victory was indeed essential and decisive. In his own summary report to Göring, dated 3 July, von Richthofen recorded that in the month-long assault his command had undertaken 23,751 sorties and dropped 20,528 tons of bombs, and by raining down "...unremitting fire on the city, port and airfields, inflicted on the enemy the heaviest losses of men and material." In this he was recording no more than the facts, something acknowledged by Hayward, who writes: "It is clear, then, that Richthofen's units performed superbly and that their outstanding achievements played an essential part in the city's fall. Functioning as 'flying artillery', they provided the army with an unprecedented level of tactical air support."²³

He adds: "The *Luftwaffe*'s close air support level reached a peak at Sevastopol, and it would not be equalled in the coming push toward the Caucasus oil fields."²⁴

The reason for this was Hitler's obsession with Stalingrad which drew away not only VIII. *Fliegerkorps* *Stukas* but also much of *General der Flieger* Curt Pflugbeil's IV. *Fliegerkorps* strength into what a sapping ordeal and ultimate disaster.

Stalingrad

Case *Blau*, the drive to the Volga, followed the defeat of the Soviet offensive against Kharkov under Marshal Timoshenko in May 1942. St.G 2 'Immelmann', having rested and refurbished at its home bases, moved forward through Olmütz, Krakow and Zhitomir in the Ukraine. The last leg was flown from Zhitomir to Achitirskaja, the *Gruppen* flying in *Ketten*, with 15 minute intervals between each, so as to



A pilot of Stab I./St.G 77, possibly the Kommandeur, Hptm. Helmut Bruck, boarding his Ju 87 B. This photograph was probably taken between April and July 1942 when the Gruppe was operating from airfields in the Crimea, hence the life jacket.

21. "...the fortifications were in general undamaged and the morale of the defending forces unbroken." *The Rise and Fall of the Luftwaffe 1939-1945*, op cit.

22. Joel S A Hayward, *Stopped at Stalingrad: The Luftwaffe and Hitler's Defeat in the East, 1942-1943*, University of Kansas Press, Lawrence, Kansas, 1998.

23. *ibid*.

24. *ibid*.



The same machine as shown on page 129 (bottom right) is again visible in the background in this view of a formation of Ju 87 D-3s of St. G 2. When the original II./St.G 2, which flew in North Africa, was redesignated II./St.G 3, a new II./St.G 2 was formed in January 1942. The Gruppenstab, 4., and 5. Staffeln followed the standard practice of using the Staffel letters C, M and N, but 6. Staffel used the letter O instead of the standard P. Note the horseman badge, which appears on a white disc on this machine, T6+D0. This was originally the badge of Stab II./St.G 2, but it was later adopted by the whole of the reformed II./St.G 2, as shown this machine of 6./St.G 2. In the foreground is T6+BC, a Ju 87 D-1 W.Nr.2491, of Stab II./St.G 2.



Junkers Ju 87 D-1 of Stab II./St.G 2, Russia, Summer 1942

This machine, W.Nr. 2491, was lost in November 1942. It was camouflaged in a standard 70/71/65 scheme and had the spinner tip and, unusually, the last letter of the operational code, in RLM 25 green. The name Bärli on the engine cowling means Little Bear.

not to alert the enemy by a mass flight. Here they were placed under the command of VIII. *Fliegerkorps*. They were briefed to provide support for the *Wehrmacht* which was attacking across the flat, featureless plain, toward Voronezh and to break down the enemy by continuous air attacks using smaller formations of *Ketten* (three aircraft) or *Schwaerme* (seven aircraft).²⁵ Progress was swift, St.G 2 delivering a mass dive-bombing attack by 120 *Stukas* on four factories producing tanks, guns and ammunition at Voronezh, which led to the fall of that city the same day. The Germans moved on, making 500 km-leaps of their operating airstrips every few days to keep up with the advance.

On arrival before Kalach, the last hurdle before the Don, St.G 2 was transferred to the airfield of Tatsinskaya, some 150 km from Stalingrad. The *Geschwaderkommodore*, *Oberstleutnant* Paul-Werner Hozzel had under his command I./St.G 2 (*Hauptmann* Bruno Dilley), II./St.G 2 (*Major* Dr. Ernst Kupfer), II./St.G 1 (*Hauptmann* Johann Zemsky) and III./St.G 77 (*Hauptmann* Herbert Pabst), giving a total of 170 *Stukas* of which 120 were operational at any one time. Great numbers of Soviet T-34 tanks were now encountered on the plains west of Kalach, and new tactics were evolved to deal with them. The method described by Hozzel was not to attack these armoured hordes as a single *Gruppe* because the dive-bombers would have got in each other's way, but instead, to attack by *Staffel*, in sequence. Single tanks were approached by *Ketten* flying parallel, at an attack angle of 40 degrees, aiming the whole aircraft via the reflex sight, at the centre of the tank, then dropping a 500 kg bomb with armour-piercing warheads into the side of the target while making an extremely low pass. *Flammenbombs* were also used, which exploded the tank's own fuel and incinerated the crew. A quick pull-up on release was required, to avoid being harmed by the aircraft's own ordnance. One *Staffel* of nine to twelve *Stukas* was kept constantly over the enemy force and while one *Staffel* was still pressing home its attack, another was approaching the target. The Soviet armoured forces were thus kept under continuous pressure and, in trying to avoid the *Stuka* attacks by violent turnings, exposed themselves to the fire of German artillery and tanks. Thus the way to Stalingrad was opened and Hozzel's reinforced unit moved up to Karpovka, just 40 km from the city.

St.G 77 left its base at Grammatikovo on 13 May and moved to Rogan near Kharkov via Lozovaya, commencing operations against the Soviet spearheads the following day. The *Geschwader* flew seven sorties on the 17th, mainly against tank formations to telling effect and the enemy offensive was halted and defeated. Then the *Stukagruppen* switched back to the southern front, working from Sarabus-Süd airfield until the job was done.

VIII. *Fliegerkorps* moved north to airfields in the Kursk area in June, and the next month the German summer offensive got underway in earnest with the *Stukas* committed to a relatively narrow front supporting the *Panzers'* drive on Voronezh. The armoured columns pushed on rapidly to the east of the Donets and down the river Don. It soon became clear that the Soviets were determined on holding the city and were pouring in reinforcements. Sensing a new Verdun that would wear down the final Russian reserves, the Germans accepted the challenge. Richthofen's air plan, now he commanded *Luftflotte* 4, was to once again concentrate on the *Schwerpunkt* effect, and VIII. *Fliegerkorps* which had been placed under the command of *General der Flieger* Martin Fiebig joined IV. *Fliegerkorps* to deliver the *coup de grâce*.

The siege of Stalingrad developed gradually, the city could have been taken easily at the start but slowly the Soviets were allowed to develop the western bank of the Volga into a fortress of rubble, with each street, each building and sometimes, each floor or room having to be fought for metre-by-metre. 6. *Armee* was fed piecemeal into this grinder and worn down progressively. As far as the *Stukas* were concerned this type of fighting was very different from the fluid war of manoeuvre for which they were designed. But now they came into their own as real close-support aircraft. Indeed, far from being a 'back-area, bomber, the Ju 87's pilots were flying missions, as Hans-Ulrich Rudel described, "map in hand"²⁶, so closely intertwined were the combatants. Never has close-support been performed in such close proximity to friendly ground forces, and only the accuracy of the dive-bomber could achieve such delicate work consistently.

Paul-Werner Hozzel was to describe in detail the work done by the *Stukas* at this time. Being based so close to the target gave them a "chock-to-chock" time of just 45 minutes, and this included taxiing to the start line, take-off, approach to target, a climb to an altitude of 4,000 metres, identification of target, dive attack, low-level flight departure, landing and taxiing back to the apron. Here the 'Black Men' perfected a 15-minute aircraft turn-around, in which a new bomb was loaded from trolley to crutch, and a brief technical and damage check carried out. With such a professional routine, up to

²⁵. Paul-Werner Hozzel, *Recollections and Experiences of a Stuka pilot 1931-45*, Ohio Battle Institute, 1978.

²⁶. Hans-Ulrich Rudel, *Stuka Pilot*, Dublin 1953.

This Ju 87 D-5, banking to attack its target, shows again the trail of exhaust deposit which often marked the whole length of the fuselage of operational machines. Note the characteristic extended wingtips of the D-5, tipped in yellow, and the Stammkennzeichen under the wings. Note the Dinortstäbe extenders fitted to the bombs on the outboard wing pylons.



In clear weather, operations flown from airfields situated too close to the front were disadvantageous as the machines were obliged to climb to height and form up in full view of the enemy. This gave the Soviets ample time to scramble their fighters and, since their fighter control system was very efficient, vector them onto the Ju 87 formation. This photograph shows a Ju 87 D-5 of an unidentified Schlachtgeschwader armed with a single SC 500 under the fuselage and two SC 50 bombs with Dinortstäbe extenders under each wing.





The first component of the Regia Aeronautica's Italian Expeditionary Corps in Russia arrived in August 1941 and comprised the 22 Gruppo equipped with Macchi C.200 fighters. Here, a Ju 87 D-1 of II./St.G 2 is being escorted by these aircraft in the summer of 1942.



Aircraft of I./St.G 2 photographed while returning from a mission or while transferring base. The formation is split into separate elements, each consisting of a Staffel with an aircraft of I. Staffel in the foreground.

eight sorties per day were possible between sunrise and sunset, with the *Stukas* on occasions mounting 800 sorties per day.²⁷

Hozzel recorded a mass attack by 120 *Stukas* from three separate Gruppen, I./St.G 2, II./St.G 1 and I./St.G 77 against the notorious Stalingrad tractor factory which was held by fanatical Soviet troops hunkered down in the basement against all attempts to rout them.

It was decided to attempt a mass *Stuka* attack against the factory. The plant was huge, extending about 1000 metres from west to east, with a width of 50 metres. It was invested by German troops on three sides, to north, south and west, but open to the east from where a constant flow of Russian reinforcements was fed into it. Richthofen himself stressed that great accuracy was required, so close were the two sides, and both he and General Paulus, commander of 6. *Armee* were to observe the attack personally. Conditions ruled out an attack from 4,000 metres and instead Hozzel ordered a rooftop-level bomb release – in his expression, pushing each bomb into the target, “...like loaves of bread into an oven” which, given the scale of enemy anti-aircraft fire, was a good description.

Each Ju 87 was armed with a single 1,000 kg bomb and two 25 kg high-explosive bombs under the wings. Every pilot was carefully briefed, aerial photograph mosaic maps were studied and marked in red crayon, and the exact sequence of attack reiterated. The whole attack was to be delivered *Staffel* by *Staffel* in rapid succession in order to wear down the enemy. The whole combined striking force assembled in a holding area at an altitude of between 1,000 and 2,000 metres, outside the range of defending flak. There was no fighter escort. Then each unit began its approach, led by the *Stabskette*. The effect was “...as on a string of pearls, one plane succeeding the other with only a few seconds gap between each one.” Hozzel, watching in his lead *Stuka* from the west, averred that not a single bomb missed the target. High praise was heaped on the crews for such precision. However, when the German infantry confidently renewed the assault they were met by heavy fire “...as if the *Geschwader* had dropped toy torpedoes instead of bombs.”²⁸

Von Richthofen continually complained that much of the good work done by the Ju 87s was wasted by the failure of the Army to follow up quickly enough. The grinding down of the German attack continued unabated for another month without much progress. By the time the Soviet counter-attack against the vulnerable flanks of the German salient, which were weakly held by their Rumanian and Italian allies, was launched, on 19 November. Soon, General Friedrich Paulus saw his 6. *Armee* surrounded and cut off. Hozzel's *Stukas* managed to fly out of the encirclement, taking many of their ground crew with them, but some seven hundred of these vital men were left behind, being formed into *Luftwaffe* Field Battalion 'Immelmann' and all were lost in the eventual defeat.

²⁷ Paul-Werner Hozzel, *Recollections and Experiences of a Stuka pilot 1931-45*, op cit.

²⁸ *ibid.*



Generaloberst Freiherr von Richthofen (second from left), the commander of Luftflotte 4, during a visit to the 'Immelmann' Geschwader, probably during the summer of 1942. From the left, are Major Paul-Werner Hozzel, the Kommodore of St.G 2, von Richthofen, von Richthofen's adjutant and Hptm. Dieter Pekrun, the adjutant of St.G 2.

Both II./St.G 1 and I./St.G 77 had already been withdrawn from the Stalingrad front and had returned to their original *Geschwader* so Hozzel was left with I. and II./St.G 2, with about thirty operational aircraft remaining on their strength, while III./St.G 2 had been operating down in Nikolayev. All flyable *Stukas* were allocated to the I. *Gruppe*, while all the non-combat-worthy aircraft were ferried down to that base for complete overhauls of engines and airframes. Not until January did fresh aircraft and aircrews finally join the unit from Germany.

The *Luftwaffe*'s operational strength had fallen to 402 aircraft by transfers to other theatres, and was thus not strong enough to either prevent the enemy pincers closing, or to force an escape route, although the latter option was forbidden on the totally false hope that the Army could be supplied from the air, something Richthofen

himself strenuously, but unsuccessfully explained to anyone who would listen, was impossible. On 2 February 1943 it was all over and 6. *Armee* ceased to exist.

Ju 87 unit Order of Battle
31 January 1943

Luftflotte 1

Stab/St.G 1	Bf 110, Ju 87	10	(6)
III.Gruppe/St.G 1	Ju 87 (jointly with Luftflotte Ost)	32	(20)
I.Gruppe/St.G 5	Ju 87	32	(23)

Luftflotte 4

I.Gruppe/Sch.G 1	Bf 109	16	(9)
II.Gruppe/Sch.G 1	Hs 129 (with Kommando Don)		
	Fw 190 (with Kommando Don)	27	(11)
Stab/St.G 2	Bf 110		
	Ju 87	6	(4)
I.Gruppe/St.G 2	Ju 87	28	(10)
Stab/St.G 77	Ju 87, Bf 110	9	(3)
I.Gruppe/St.G 77	Ju 87	13	(10)
II.Gruppe/St.G 77	Ju 87	23	(13)

Luftflotte Ost

4.Staffel/St.G 5	Ju 87	13	(10)
III.Gruppe/St.G 1	(see Luftflotte 1)		

Luftwaffenkommando Don

III.Gruppe/St.G 2	Ju 87	26	(11)
II.Gruppe/Sch.G 1	(see Luftflotte 4)		

The Soviet armies had swept ever further westward toward the Donets, and all along the line the Germans fell back. Hozzel recalled an incident on 20 February when Richthofen telephoned him and demanded to know how many Ju 87s could be mustered at short notice for a quick move to Dnepropetrovsk were they were urgently needed to repulse a Soviet tank breakthrough. Some 46 *Stukas* made the transfer within an hour where they were joined the following day by a further eighty from St.G 77 giving an operational total of 125 dive-bombers. All these were thrown into the desperate fighting, flying low-level attacks from dawn to dusk against Russian divisions advancing across the open plains and their supporting artillery batteries. This attack was held and then reversed.



A Ju 87 D-3 of I./St.G 2. Note the aircraft letter L and the numeral 11 on the undercarriage fairing. When Gruppen consisted of three Staffeln, some letters were not used in aircraft code systems, hence the slight mismatch between the L, the twelfth letter of the alphabet, and the 11.



The basic method of army cooperation in the Luftwaffe was to instruct a formation to cooperate directly with an army formation and, provided it was technically possible, give it all the support it requested. Obviously this was not the case here, where ground crew on a forward landing ground are loading a bomb beneath a Ju 87 D-1 without the aid of any ground support equipment.

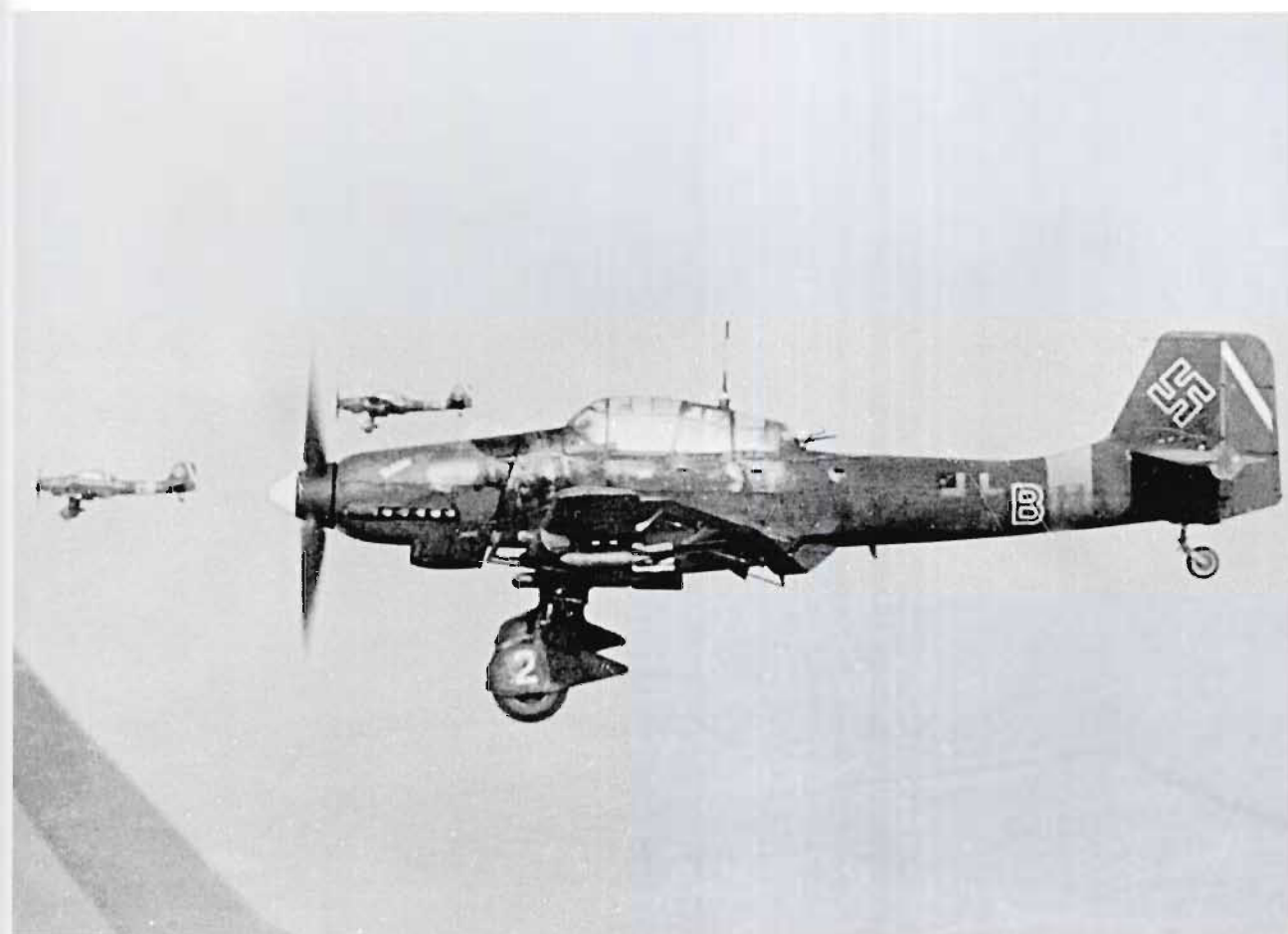


Above: Snow camouflaged Ju 87 D-3s of an unidentified unit in the winter of 1942/43. Note the towing attachment under the tail and the extent to which components have been removed from the undercarriage.

Groundcrew load up a bomb on the new streamlined underwing racks introduced with the Ju 87 D. The racks could accommodate three types of ordnance in the combination of two 250 kg bombs side-by-side on the outer Schloss 500/XIIC fitting, or one larger size bomb or weapons container on the central 1000/500/XI B fitting. As seen here, the central section to the streamlined fitting was often removed to aid the fitting of the ordnance under combat conditions.



A Ju 87 D-5 undergoes refuelling for its next mission. The D-5 was the last variant of the Ju 87 built as a dive-bomber, though the dive brakes were often removed as the nature of operations changed from fixed targets like bridges, gun emplacements etc. to pure ground attack operations in support of the troops. The replacement of the forward firing MG 17 machine guns with MG 151 20mm and a new wing design which offered greater wing-loading potential in terms of ordnance, give clues to the operational change in role for the Ju 87.



Two views of Ju 87 D-3s of 4./St.G 2 enroute to a target in Russia. The aircraft in both views T6+BM, which as a 'White 2' painted on its wheel spat has had its leather oleo shock-bands (compression cover) removed from the undercarriage fairings. The white stripe on the rudder was an additional Staffel identification.

Another Ju 87D-3 of Stukageschwader 2 in similar winter camouflage. The bombs beneath the wings have been fitted with fuse extensions, known as Dinortstäbe, or Dinort Rods, and sometimes as Dinort Asparagus. Bombs with these extensions were primarily employed against such 'soft' targets as lorries and troops.



A particularly untidy snow scheme, evidently applied by brush in the winter of 1943/44. The aircraft, a Ju 87 D-5, is armed with AB 250 bomb containers on the wing racks. The Soviets named these cluster weapons 'Frogs' because of the noise they made when heard exploding in the distance.

Luftwaffe ground personnel clearing snow from around a suitably camouflaged Ju 87 D. It was found preferable to roll the snow hard and flat for a runway rather than laboriously clear it by hand.

A Ju 87 D taxis in after a mission to await the attention of its ground crew during operations on the Eastern Front. Note how the wheel spats have been left in their original camouflage.





In the large open spaces of Russia, any suitable area could become an airfield, and taking-off could be carried out in line abreast so that dust did not obscure the pilots' vision. Shown here shortly before taking off on a mission are Ju 87 D-5s of the Alarmverband of III./St.G 2, which consisted of aircraft and crews drawn from the Gruppe's various Staffeln. The aircraft nearest the camera had the front of the spinner and the letter A on the wheel fairings in green, RLM 25, and was coded T6+AD. This was the Kommandeur's machine and was flown by Hans-Ulrich Rudel, seen still with his canopy open.



However, Rostov, Voroshilovgrad, Kharkov, Belograd and Kursk fell, while to the north Moscow was safe and Russian troops advanced to Rzhev and Vyasma and the siege of Leningrad was lifted. As far as the Ju 87 was concerned, this period of great pressure was notable for the abrupt dismissal of Major Walter Enneccerus from his command of the I./StG 77. He refused to despatch his crews on what he sincerely believed was a suicidal mission. His daughter told this author that there was considerable embarrassment at this decision and that his colleagues were split, some agreeing with his stand, while others felt that the *Stuka* tradition was that the troops on the ground were to be supported no matter what. 'Ennec' was too prominent a person to be court-martialled however, so he was ordered back to Germany on 'extended leave' and his place taken by *Hauptmann* Helmut Bruck.

The *Fliegerdivision Donez* had been formed from the close-support units of VIII. *Fliegerkorps*. The *Stukas* of this force, incorporated into IV. *Fliegerkorps*, took part in blunting the Soviet advance at Stalino, and then led the great German counter-offensive to retake Kharkov in the last big manifestation of *Blitzkrieg*. For the last time *Stuka* and *Panzer* combined in sufficient strength, flying up to 1,250 sorties on one day, to smash all resistance and Kharkov was taken on 15 March.

I./St.G 77 shifted base to Dnepropetrovsk airfield on the River Dnieper and was soon flying four sorties a day, engaging T-34s at Makeyevka, Boguslav, Pavlograd and other villages as the Soviet Sixth Army suffered the same fate as had befallen the German 6. *Armee*, at the hands of the 4. *Panzer Armee*. The *Stukas* pounded the trapped Russians continually until they were annihilated. They then began to use Pavlograd airfield as their forward operating base for attacks on the Kharkov tractor works where Stalin had commanded his troops to resist to the last man.

The RAF history was forced to acknowledge this achievement noting that while there "...was no doubting the skill with which Richthofen handled the forces under his command", he also benefited from the advice of *Oberstleutnant* Otto Weiss, the Inspector of Ground-Attack Forces operating as *Panzerjagdkommando Weiss*, who had the specific mission of directing the anti-tank operations from Zaporozhye. The Germans were thus able to push on to Belgorod before the spring thaw brought the offensive to a pause.

During April and May preparations went ahead for an even greater offensive planned for the summer, but *Stuka* operations were at a reduced level, once more due to transfers to the Mediterranean area and elsewhere. The dive-bombers that remained in Russia were now used more strategically, as on 22 May, when twenty-four *Doras* from I./St.G 1 attacked the main rail station at Volkhovstroi, while a similar strength force from II./St.G 1 was similarly directed against Kursk station and railway sidings which were packed with military equipment. The Soviets claimed to have shot down no fewer than eleven *Stukas* over Kursk and two over Volkhovstroi this day, but, once again, no losses were actually recorded in the *Generalquartiermeister* returns that day.

Improved *Dora*

There was a call for a 'tropicalised' version of the *Dora* and a study was made for just such a machine, which was the D-2. The usual modifications to the basic design would have seen the dust filter added, along with the additional in-cockpit stocks of medical kits, emergency rations and hunting equipment already introduced on *Fliegerkorps Afrika's* Ju 87B/*Trops*.

To produce a better machine for the peculiar operating conditions found in North Africa and to speed up production, the genus of the D-2 initially included incorporating both the wings and the undercarriage of the B-2, which had proved more reliable in practice. Extra fuel capacity was to have been provided by a pair of 300 litre underwing drop-tanks as standard fitting.

However, as a result of bitter experience with the enhanced flak defences that the *Stuka* was now facing in both North Africa and Russia, it was felt that a greater need was for more aircrew protection and this gave rise to a new direction for the D-2. Extra armour was worked in on a converted *Dora*, which, not surprisingly due to the extra weight, adversely affected the aircraft's performance, both in speed, range, climb rate and operation ceiling. The D-2 concept was therefore largely abandoned, although the designation itself was subsequently applied to any *Stuka*, which had her rear fuselage strengthened and a towing hook box added as a tug for a glider. The work done also spurred further testing of *Stuka* defensive capability, including an armoured pilots' seat, which was retrofitted to both the *Dora-1* and later formed the basis of enhanced protection mounted in the *Dora-5*, but mainly led to the introduction of the *Dora-3*.

There was no denying the need for a more solid defence against ground fire if the *Stukagruppen* were to continue operating in the low-level role in addition to pure dive-bombing. Both the aircrew and engine were shown to be increasingly vulnerable to not only automatic weapons such as the 20 mm



A Rumanian Ju 87 D-3 undergoing engine maintenance, probably in the early spring of 1944.



Junkers Ju 87 D-3 of Grupul 3, Royal Rumanian Air Force

The Ju 87s of the Rumanian Air Force were finished in the standard Luftwaffe 70/71/65 scheme and carried Rumanian national insignia in the usual positions. Unlike the Luftwaffe's machines, however, which were identified by their fuselage markings, Rumanian aircraft had a numeral on the tail surfaces for this purpose. In this instance, the suffix letter indicates that the machine was a replacement for a machine originally numbered 34. Note the Rumanian national colours on the propeller spinner.



The *Forțele Aeriene Regale ale României* (Royal Rumanian Air Force) received the first of some 115 Ju 87 Ds in the summer of 1943. First to be equipped were the three squadrons of the Grupul 6 Bombardement (6th Bomber Group). This was followed six months later by the Grupul 3 Bombardement, which also received the type. Aircraft of Grupul 3 are shown here setting off on a mission.

fairing being blanked off, or omitted altogether while building.

Some 1,559 *Dora*-3s were finally produced, being supplied to Rumania as well as the *Luftwaffe*, the final known recipient being I./St.G 5 in March 1943.

The Kuban Bridgehead

On 4 February, 1943, just two days after the disaster at Stalingrad, the Soviets landed close to the vital Black Sea port of Novorossiisk. It was considered vital that the German bridgehead on the Taman Peninsula be held as it both guarded the approaches to the Crimea and was the door to future offensives in the Caucasus. As a result both sides saw it as a vital strategic asset and each threw in all the resources they had, particularly in the air where *Luftflotte* 4 faced two Soviet Air Armies. The German counter-attack (Operation Neptune) commenced at Myskhako on 17 April and was spearheaded by *Stukas* of the St.G 77. Fighting continued in high intensity throughout the next month and on into June, but the failure of the Kursk offensive to the north, sealed the fate of the Crimea, and, after further hard fighting in 1944, the Germans had to finally had to evacuate their forces.

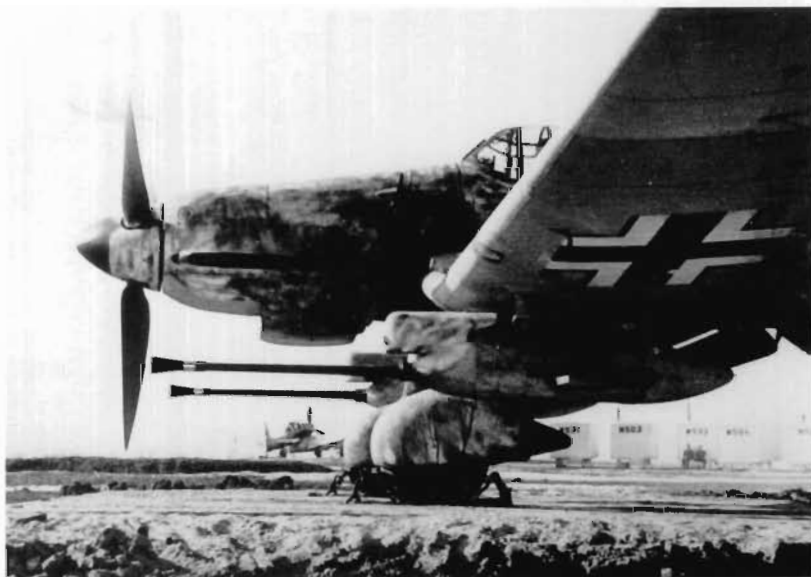
The Gustav

To help offset the increasing numbers of heavy T-34 battle tanks, which the Soviets were deploying from 1943 onward, a new aerial counter was urgently requested. Initially, it had been hoped that the new free-fall SD-2, -4, -H1 and -10 thick-walled penetration bombs would suffice. The SD-2 was later refined into the SD-4 HL (*Hohl Ladung* – hollow-charge) anti-tank weapon. This had the advantage of being capable of knocking out a T-34 if it detonated within 24 metres of the target so pinpoint accuracy was no longer a requirement. However, by early 1942 an alternative anti-tank weapon for the *Luftwaffe* was already under study. For Junkers this took shape as a flying tank-hunter, armed with the most powerful weapon possible, able to plug the gaps in the German front lines when suitable ground anti-tank guns could not be deployed in time, either for reasons of scarcity over such an enormous front, or immobility due to bad weather conditions and primitive roads.

Since replacements for the *Stuka* had failed to materialise, the stalwart Ju 87 was again a natural choice after trials with a range of aircraft had been conducted. Also, the weapons to be carried were selected. This was the 37 mm (*Bord Kanon*) BK 18 cannon, which was developed from the *Flak* 18 anti-aircraft gun of 1933. By replacing the electrically operated sighting mechanism with a remote controlled pneumatic system, the first-class ballistics of this weapon showed great promise as an armour-piercing system. The muzzle velocity was 855 metres per second firing a 1.4 kg *Minengranatpatrone* 18 tungsten-cored explosive shell. This was capable of penetrating the 58 mm thick armour of a Soviet tank at a 60-degree angle of impact at a range of 100 metres and 95mm armour could be penetrated at a range of 600m at a 90-degree (horizontal) trajectory. Development improvements ensured that this improved to penetration of 140mm

Bofors and the like, but also to massed small-arms fire. The addition of extra armour sheeting, *Appliqué*, which was bolted on over the forward undersides and engine cowling, as well as around the cockpit area of the D-3, was therefore essential. A 50 mm thick armoured-glass windshield was another innovation which was built in at Weser and Lemwerder, and later, to help compensate for some of the extra burden, the sirens, which were deemed to have lost their initial affect on infantry anyway, were dropped, the

A winter camouflaged Ju 87 G awaits a test firing of its 37 mm (*Bord Kanon*) BK 18 cannon. The muzzle velocity of this 1.4 kg *Minengranatpatrone* 18 tungsten-cored explosive shell was 855 metres per second. It was capable of penetrating the 58 mm armour of Soviet tanks at a 60-degree angle of impact at a range of 100 metres and 95 mm armour could be penetrated at a range of 600 metres at a 90-degree horizontal trajectory. Developments continued with even greater penetrating depths of up to 140 mm.



The business end of the 37 mm BK 3,7 cannon equipped Ju 87 G.



Test firing the 37 mm BK 3,7 cannon on a Ju 87 G.





An impressive view of a Ju 87 G as the pilot carries out his cockpit checks. Although the badge on the cowling, a white silhouette of a T-34 tank, was applied to several Ju 87 Gs, the unit has not been positively identified. This image has previously been described as being Hans Rudel's Ju 87 G.



Two views of a Luftwaffe armourers about to load a clip of 37 mm anti-tank rounds into the magazine holder of a BK 3.7 cannon.

plating at the same range, and could thus penetrate even the turret of a T-34/85 battle tank

In addition to the wolfram-cored armour-piercing (AP) rounds, the Flak 18 cannon rounds could include variations, such as the *Brandsprenggranatpatrone* (incendiary), self-destructing tracer, which ignited on penetrating the target's fuel tank and the *Sprenggranatpatrone* (high explosive) tracer, with soft-nosed versions for thin-skinned targets. The rounds were carried in clips of six, in rectangular metal containers, a pair of which were welded together in the standard fitting. The firing mechanism itself was sealed within a streamlined pod, which had an external hydraulic oil heater atop. The cannon were slung beneath the wings outboard of the undercarriage. Tests showed the need for a strengthened wing to withstand the weight, which soon led to the G-2 variant, but the sturdy *Stuka* proved capable of this further adaptation to its role very well.

The selected trial aircraft, a *Dora*-1, W.Nr 2552, was so equipped and trials were conducted from January 1943 onward by experienced *Stuka* flyers, including *Hauptmann* Hans-Karl Stepp, *Staffelkapitän* of 7./St.G 2 and *Oberleutnant* Hans-Ulrich Rudel, *Staffelkapitän* of 9./St.G 2, the pilot who was to immortalise this variant. Combat-testing with the *Versuchsverband für Panzerkampf* (Experimental Tank-Fighting Unit) set up under *Oberstleutnant* Otto Weiss, assisted by Stepp, went into battle for the first time on 18 March 1943 in the Bryansk region, the *Gustavs* accounting for many of the 116 Soviet tanks destroyed.



The Stammkennzeichen on this Ju 87 G-1 suggests it is either on a delivery flight or may have belonged to the Versuchskommando für Panzerbekämpfung.



A groundcrew man carries out maintenance to the rear of the Jumo 211 F of a Ju 87 G.



Two views of a Ju 87 G from St.G 1, marked with the T-34 Panzerknacker badge. The aircraft were often called Kannonenvogel (the "gun bird"). Thought devastating to Soviet armour these twin 37 mm cannon equipped Ju 87 Gs suffered a loss of speed and manoeuvrability due to the additional weight of the cannon at 700 kgs (350 kgs each).



After flying 600 sorties on the Eastern Front with St.G 2, for which he was awarded the Ritterkreuz in April 1943, Oblt. Andreas Kuffner became Staffelführer of the newly created 10.(Pz)/SG 3 in February/March 1944. With this anti-tank Staffel, he fought in the northern, central and southern sectors of the Eastern Front and destroyed his 50th tank on 25 September 1944.

Although plans to further upgrade the powerplant from that used by the *Dora*, (with the adoption of the Jumo 213A-1 engine), the resulting Ju 87 F project was soon abandoned due to the production problems. The fitting of the cannon and extra armour, compensated for by further modifications, did result in the Ju 87 G-1, of which twenty-five had been deployed to the front by the spring of 1943. Here the *Gustav Panzervogel* formed their own 'Panzerknacker' Staffeln, (the 10. Staffel in each case) additional to and serving alongside the conventional *Doras* of St.G 1 and St.G 2. The conventional *Stukas* often acted in concert with the G-1s and G-2s acting as flak suppressors against mobile anti-aircraft units that accompanied the enemy tank formations, thus clearing the way for the *Gustav* to set about its deadly work. Not everyone could handle the unwieldy *Gustav* well, but Rudel and his ilk became highly skilled at the art, often attacking at heights of below 50 metres in daylight. Rudel was credited with 'killing' more than 519 enemy tanks alone.²⁹

Despite calls for other aircraft to perform this function, neither the Bf 110 nor the Junkers Ju 88 P proved as efficient as the *Stuka* in this role. *Generalfeldmarschall* Erhard Milch therefore had little choice but to continue with the *Gustav* conversions, twenty a month being ordered. The short-wing D-3 conversions, of which there were only thirty-four, became the G-1, while the long-wing D-5 proved more adaptable, and 208 were authorised for *Gustav-2* conversion. Of these, 174 were actually new-build construction and the rest conversions. Extraneous fittings, like the original dive-brakes, bomb and weapons-container racks, portable fuel tanks, and high-altitude oxygen equipment were all stripped out, and extra armour protection installed, while the D-3s had their forward-firing MG-17 machine guns capped. Conversely a few of the D-5 conversions had their MG-151 cannon fitted with flame-dampers for twilight missions. For this type of mission, specialist radio equipment, the FuG 7a and 101, was necessary.

There were ultimately sufficient *Gustavs* to provide 12-aircraft Staffeln for St.G 3 and St.G 77, and they made their combat debut at Kerch and then at Kursk, some machines flying six sorties a day. It was here that Rudel destroyed twelve tanks in a single day's work near Belgorod. From then on the 'Panzerknacker' was an established part of the *Stuka*- and *Schlachtgruppen* and was still flying on the last day of hostilities.

Rudel was far from being the only able exponent of the *Gustav*. Typical of such flyers was *Hauptmann* Andreas Kuffner – and typical too of such a flyer was his wartime career. He was a former *Luftwaffe* anti-aircraft artilleryman who had served as such during the 1940 campaign in France, where he earned the Iron Cross. He had volunteered for pilot training earlier on but was not accepted until that August. On the successful completion of his course, he was assigned to the *Stukas*, and joined I./St.G 2 'Immelmann', flying his first combat sortie in January 1942. He soon racked up an impressive total of missions, and within three months he passed the 200 mark, before being wounded. When he returned from sick leave he went straight back into action at as the *Staffelführer* of 4. Staffel and fought with it throughout the southern battles through the Donets, the taking of Sevastopol and

²⁹ Rudel was forbidden to fly missions later, but ignored the order. Those tanks he knocked out in this later period, were officially credited to other pilots to keep his missions "officially" off the record!



In March 1944, a battle headquarters was established at Jakobstadt in central Latvia to control the Ju 87 G anti-tank aircraft of the newly created 10.(Pz)/SG 3. As well as in Latvia, the Staffel also subsequently fought in Lithuania and East Prussia, often with separate Schwärme operating from different airfields. Here a Schwarm scrambles from an airfield in Lithuania. The aircraft (311) is unusual in having the unit code S7 in grey rather than the usual black. The full code of this aircraft was S7+BU and the light area ahead of the carburettor intake shows that the covering flap is in the open position.,



Junkers Ju 87 G-2 of 10.(Pz)/SG 3, Lithuania, Autumn 1944

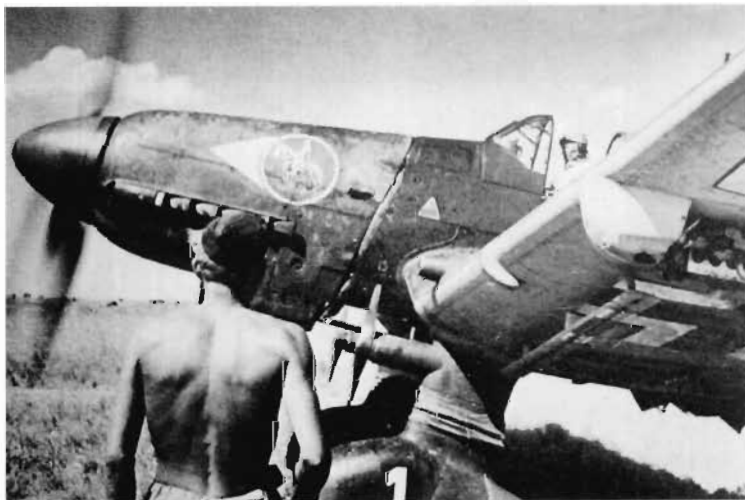
This anti-tank aircraft was camouflaged in the standard Ju 87 scheme of 70/71/65 with yellow wingtip undersides, but apparently lacked the usual yellow band around the rear fuselage. The spinner, too, is unusual in being white with a narrow black spiral, rather than vice versa, although the spinner backplate remained in green 70. The Werknummer of this aircraft is not known.

Far right: As early as March 1943, plans existed to form a complete anti-tank Geschwader of Hs 129s, Ju 87s and Ju 88s, which was to be ready for commitment in the East in the winter of 1943/44. Although a start was made in October 1943 with the creation of the Hs 129-equipped IV.(Pz)/SG 9, this remained the only Gruppe until January 1945 when I.(Pz)/SG 9 was raised, mainly by redesignating some existing Ju 87 G-equipped 10. (Panzer) Staffel attached to each Schlachtgeschwader. This photograph shows a Ju 87 G-2 with a crudely painted identification D4 on the wheel fairings.

the Kuban, by the end of which he had taken his sortie tally to six hundred! This was followed by a period flying anti-guerrilla missions against Tito's communist forces in Croatia with III./St.G 151.

It was in February 1944, that Kuffner was appointed as *Staffelkapitän* of 10.(Pz)/SG 3 which had just been established. With the *Gustav*, Kuffner saw anti-tank combat from the Crimea and in Rumania and was promoted to *Hauptmann* on 8 August. Soon after this, on 25 September, his *Staffel* destroyed its 300th tank, with Kuffner himself clocking up his 50th kill a month later. Subordinated to IV. *Fliegerkorps*, he took part in the defence of East Prussia and along the Baltic coast, before his command shifted base to Wormditt on Christmas Day. In January 1945, Kuffner was appointed as *Gruppenkommandeur* of I.(Pz.)/SG 9 and continued operations, taking his combat sortie total to over seven hundred missions, and his tank cull tally to sixty. He was awarded the Oak Leaves to his *Ritterkreuz*. Tragically his death occurred at the very end of the war. On 30 April his unit was landing at Sölte airfield near Schwerin after a mission, when it was surprised by a group of Spitfires just it was about to touch down. Both Kuffner and *Staffelführer* Rainer Nossek of the 3.(Pz)/SG 9 were killed immediately, and Wilhelm Broman of 1.(Pz) /SG 9 was badly wounded.

Three G-2 *Kanonvogel*, which were all D-5 conversions, were still serving with the NSG 1 (*Nord*) at Gütersloh when Germany surrendered.



More mystery concerning the markings of II./St.G 2 is evident in these photographs showing the *Kommodore*, Major Dr. Ernst Kupfer, about to take off on a sortie in the summer of 1942. As mentioned earlier, instead of employing a coloured third letter in the operational lettering, aircraft of II./St.G 2 often had a coloured fourth letter. This anomaly may just be seen (above left), the last letter evidently being a C. However, although the second photograph (above right) was clearly taken at the same time and shows the same machine, the letter under the wing is a D. Even if the full code was T6+DC, this is completely at odds with the norm, which called for the aircraft flown by the *Kommandeur* of a II. Gruppe to be marked +AC. A not unreasonable possibility to account for this is that Kupfer may have had more than one aircraft at his disposal. Nevertheless, another discrepancy is the colour of these letters, apparently yellow, whereas they should be green for the *Gruppen Stab*. Note also that the *Bamberger Reiter* badge of II./St.G 2 on the cowling has been modified to include a chevron to denote the *Kommandeur*. This has been photographed in different forms, either as an outline against the camouflaged background, or with different coloured backgrounds. In these photographs, the background appears to be white. Quite obvious in both photographs is the repainted engine cowling and the yellow rear area of the wheel fairings.



Major Dr. Ernst Kupfer

Ground personnel arming a Ju 87 D-1 of 7./St.G 1. The full operational code of this machine was J9+RR, with the aircraft letter being repeated on the wheel fairings.

87-750: The last letter of the code J9+AG on this Ju 87 D-3 is believed to indicate that it was a machine of the Stab Staffel of III./St.G 1. The machine was finished in a standard 70/71/65 scheme and had a green letter A on a yellow fuselage band.



Kursk

The pivotal armoured contest that was Kursk marked the final major German offensive of the war. Thanks to the *Lucy* spy ring, British *Ultra* decrypts, and deserters, the Soviets were fully informed of every German move and its timing. They therefore dug themselves in deep behind minefields, tank traps, anti-tank guns and dug-in T-34s to await the German blow with high confidence. Kursk itself had little strategic importance, but the huge salient around the city, which stretched from south of Orel to Belgorod, was a threat which the Germans could not ignore. For the Germans *Zitadelle* was to be, in Hitler's words "...a beacon to the world." It was also to be the debut of the new Panther and *Elefant* tanks, and also of the *Gustav*.

The colossal battle was triggered, at 1445 on 4 July 1943, once more, by the *Stukas* from all five *Stukagruppen* of *Luftflotte* 4, which in a concentrated ten-minute assault, softened up the defences at Butovo. They planted their bombs into an area of the frontal defences some three kilometres in length to a depth of 450 metres thus allowing the 3. and 11. *Panzer Divisions* to advance 32 kilometres, but here they were then held.

I./St.G 77 was working from airfields at Bogodukhov, Khotmyzhsk and Kremenchug, north of Kharkov, and its targets were the usual ones of tanks, trenches, fortifications and more tanks, especially when Soviet counter-attacks began on 11 July. Despite all efforts it was clear that the German pincers this time, would not meet – the defences were too strong. On the contrary, the Germans were forced to go over to the defensive when the enemy attacked south in great force from the Orel salient and punched their way as far to the rear of the attackers as Khotinets. The *Stukas* of *Oberst Dr. Ernst Kupfer*, *Kommodore* of St.G 2, based at Karachev were threatened and for three days every Ju 87 that could be got into the air, was despatched against the enemy armour. The intervention of the *Stuka* yet again proved decisive and Karachev was turned into a gigantic graveyard for the T-34s. This proved to be both the greatest of such duels, both in scale and completeness, but also the last, such *Stuka* victory over Soviet armour.

From this date the Ju 87 would be fighting a defensive war on the Eastern Front in which localised victories were still achieved but the overall trend was retreat, all the way to Berlin. From spearhead to stemming the flow, the role of the Ju 87 had dramatically changed. Nor was it only in Russia that the tide had turned against the Germans, in North Africa too, defeat was imminent.

1942-1945

Ju 87 unit Order of Battle**31 August 1943** (Eastern Front only)**Luftflotte 4**

Stab/St.G 2	Ju 87	2	(1)
I.Gruppe/St.G 2	Ju 87	29	(17)
II.Gruppe/St.G 2	Ju 87	28	(16)
III.Gruppe/St.G 2	Ju 87	28	(16)
Pz.Jäg.Sta./St.G 2	Ju 87	8	(4)
Stab/St.G 77	Ju 87 *	3	(4)
I.Gruppe/St.G 77	Ju 87	31	(18)
II.Gruppe/St.G 77	Ju 87	30	(16)
III.Gruppe/St.G 77	Ju 87	34	(21)

Luftflotte 5 (Ost)

I.Gruppe/St.G 5	Ju 87	36	(32)
V.Gruppe/St.G 151	Ju 87	9	(8)

Luftflotte 6

Stab/Sch.G 1	Fw 190	4	(1)
I.Gruppe/Sch.G 1	Fw 190 (less 4.Staffel)	27	(15)
4.Staffel/Sch.G 1	Hs 129	8	(5)
II.Gruppe/Sch.G 1	Fw 190 (less 7. & 8.Staffeln)	22	(8)
7.Staffel/Sch.G 1	Hs 123	11	(6)
8.Staffel/Sch.G 1	Hs 129	10	(5)
4.Staffel/Sch.G 2	Hs 129	8	(8)
8.Staffel/Sch.G 2	Hs 129	10	(9)
Stab/St.G 1	Ju 87	3	(3)
I.Gruppe/St.G 1	Ju 87	24	(13)
II.Gruppe/St.G 1	Ju 87	32	(18)
III.Gruppe/St.G 1	Ju 87	20	(15)
Pz.Jäg.Sta./St.G 1	Ju 87	8	(4)
III.Gruppe/St.G 3	Ju 87	30	(19)

*The figures given for this unit are obviously incorrect. They have either been transposed or they are wrong.

Tunisia – the *Stuka*'s swan-song in North Africa

With the Allied armies driving in on Tunisia from both east and west, from November 1942 onward, the thirty or so *Stukas* of II./St.G 3, commanded by *Hauptmann* Heinrich Heine, were staged in from Sardinia to El Aounia airfield near Tunis, and then on to Djedeida, 30 kilometers from the capital. They flew their first combat mission with five aircraft on Thursday, 12 November¹⁰. At the same time III./St.G 3, led by *Major* Benhard Hamester, had withdrawn to Gabes-West where it disputed the attack on the Mareth Line and took part in the battle at Kasserine. At the end of February, this unit shifted base to Mezouna-Nord and then to El Djem. Far from being helpless in “a fighter-bomber's war” the *Doras* of these two units were able to deliver several bloody noses to the over-confident Allies before the superiority on the ground brought about the final evacuation of North Africa in mid-April.

In their final African missions the Ju 87s were aided by their own resilience and ability to operate practically anywhere, plus the fact that, for the most part, they held the permanent airfields so that, when appalling weather often caused the overwhelming Allied air forces to cease operations, the *Stukas* kept flying. The first of their contributions took place at Medjez el Bab where a Vichy-French force held the vital bridges and town, and were reinforced by the British parachute battalion and American field artillery. By launching a surprise assault on 18 November 1942, a tiny force of just three hundred German paratroops, aided by a surgically accurate dive-bombing attack from II./St.G 3, totally out-thought and defeated the superior Allied defenders. Even Winston Churchill was forced to give grudging praise to the *Stuka*'s work here, describing the operation as “...a striking example of bluff

³⁰ BA-MA RL 7/40.

A Ju 87 D-3 of 5./St.G 3, probably in Tunisia in February or March 1943. Towards the end of March 1943, it became evident that, because of the enemy's superior number of fighters, the technically outmoded Ju 87s were absorbing so many friendly fighters as escorts that they were unable to carry out their other allocated tasks. Moreover, Allied fighter attacks frequently forced the Ju 87s to jettison their bombs, and as this was of no benefit to the ground forces, an application was made for the Ju 87 formations to be relieved. This, however, was not put into effect until the middle of April, when the Ju 87s of St.G 3 were finally withdrawn to Germany. The fuselage code on the machine shown here was S7+JN.



achieved by boldness by a small detachment less than a tenth of the size of the force in possession.”³¹

Tables turned – the attack on Djedeida

At the very beginning of the Allied offensive designed to capture the strategically vital ports of Bizerta and Tunis, which commenced on 25 November, a force spearheaded by the American 1st Armored Regiment, achieved a surprise breakthrough and on the first day, penetrated as far as Djedeida airfield itself. The bulk of II./St.G 3 had moved into the airfield just a few days earlier, although elements still remained behind at El Aouina. On 22 November, thirteen Ju 87s of II./St.G 3 attacked Souk el Arba airfield. The *Stukas* had been steadily in action against Allied tanks and transports, mounting seventeen sorties against enemy columns near Testour on the 24th³² and forty-eight in four missions on the 25th.

The unit's *Dora*-1s and 3s had already mounted one attack at 1430 and another was sent off at 1505, landing back at their base at 1615. A quarter of an hour later some twelve or so American M3 tanks suddenly burst through the airfield perimeter and started to open fire at the parked aircraft, which mainly consisted of *Stukas* and Bf 109 Gs from I. and III./JG 53 which were acting as their escorts. In a wild *mêlée*, the tanks roared around, smashing aircraft to shreds, while the German airmen frantically attempted to take off so that they could strafe the offenders, while the ground crews either cowered in their slit trenches or drove vehicles as fast as they could down the Tunis road towards safety.

One German source³³ gives the losses as twenty-four Ju 87s (but only three aircrew) and five Bf 109s, while the Germans claimed eight tanks destroyed; the Americans admitted to just one lost and another damaged, before they withdrew to Chouigui. The next day an air attack was made on the survivors using both P-38 Lightning fighters and Douglas Boston medium bombers, in which a further

³¹ W.S. Churchill, *History of the Second World War*, Vol. IV. The Hinge of Fate, (London, 1954)

³² BA MA RL 7/30.

ten *Stukas* and Bf 109s were claimed destroyed. How accurate these claims were is unclear, but certainly II./St.G 3 could only mount two sorties on the 26th, and none at all the following day as the surviving flyable *Stukas* moved back to El Aouina to await reinforcements which were being transferred in via Sicily. The *Stukas* soon returned to action, however, flying five missions totalling 24 sorties against enemy targets near Chouigui and Tebourba on 28 November and again the following day, when they claimed to have destroyed twenty Allied tanks³⁴. Eight dive-bombers were lost in combat missions during November³⁵ in addition to the tank raid casualties, but the *Stukas* were soon to amply avenge this surprise.

The Allied attack having been held, the Germans counter-attacked on 1 December, and II./St.G 3 flew 35 combat sorties that day, principally against the American 1st Armored Division, which took heavy losses. A further thirty-six sorties by the *Doras* followed on Thursday 3 December, when Tebourba was re-taken, but the rainy season commenced five days later, slowing down the tempo of operations for both sides. Missions resumed against enemy troops near Béja on 29 December.

Attacks on Bône

The dive-bombers also contributed to the efforts to slow down the Allied build-up by sea. Switching from land to shipping targets, II./St.G 3 frequently attacked the main British supply port of Bône, 17 November being the first such mission when fifteen *Stukas* were part of a mixed force that hit the port. They sortied again on 27/28 November, when the British destroyer *Ithurie* was hit so badly she was scrapped, and again on 4 and 5 December. Heavy damage was inflicted on the harbour jetties, which the complacent Allies had left heaped high with ammunition, petrol and stores. The *Stukas* paid repeat visits on 1 and 2 January 1943, each time with ten aircraft as part of a mixed force.³⁶ However, far from this being the *Gruppe's*, "...one significant success", Admiral Sir Andrew Cunningham was to record how, on the contrary:

*"Two merchant ships (these were the Dalhanna and Harpalyce), were damaged, and the berthing facilities were much hampered by the grounding of stricken ships. Another sharp attack took place next day, when the Ajax was near-missed; the minesweeper Alarm had her back broken and had to be beached, finally becoming a total loss; while four merchantmen (among them the Novelist) were hit and caught fire. Two of them (these were the tanker Empire Metal and collier St. Merrel) were lost."*³⁷

Effect on American troops

On Sunday, 3 January, five *Doras* were part of a mixed force, which struck an Allied column close to Fondouk³⁸. Even a handful of *Stukas* had an effect on the raw American troops who were undergoing their first taste of dive-bombing, even if only on a small scale. They no more liked the experience than had the French, Belgians, British, Greeks or Russians. Soon complaints began to be received from the commanders on the ground about the, "...repeated attacks by the supposedly obsolete German *Stukas*." Brigadier-General Paul Robinette, who led the US Army's *Combat Command B*, told his Air Force opposite number that his could not stand the mental and physical strain imposed. When the First Army's attack ground to a halt, the indignant commander of the US II Corps, General George Patton, was vitriolic, stating the enemy had been permitted to dive-bomb his divisional command post and many of his support units, with no fighter opposition. As one American historian noted:

*"In the middle of the battle German Stukas laid on a vicious attack on the 1st Armored Division's Combat Command D. Ground commanders again asked for more air cover."*¹⁹

In the end no less a personage than General Dwight D. Eisenhower joined in the fray, stating that, despite the fact that the Allied air forces claimed complete air control over the battlefield, enemy

³³. *Führer der Luftwaffe Tunis* : BA-MA RL 7/30.

³⁴. *Ibid*

³⁵. *Flugzeugbestand und Bewegungsmeldungen II.* /St.G.3-: BA-MA RL 2 III/875.

³⁶. It has been claimed that the *Stukas*, on both the occasions the combined force attacked the British cruiser *Ajax*, scored a direct hit with a 550 kg bomb in the first assault and badly damaging her underwater with a close miss on the second. However, again, this is simply not true and it has been confirmed that this damage was, in fact, inflicted by the Fw 190s of III./SKG 10. (See Morten Jessen, *Focke-Wulf Fw 190 in North Africa*, MSS made available to the author). This put this famous ship, which had just rejoined the fleet after earlier damage, totally out of action for ten months while she underwent major repairs in New York.

³⁷. Cunningham of Hyndhope, *A Sailors Odyssey*, op cit.

³⁸. BA-MA RL, 7/32

After being withdrawn from Tunisia and following rest and refitting, the Geschwader Stab and II./St.G 3 were sent to Greece, while I. and III. Gruppe operated on the Eastern Front. The lack of wheel fairings on this Ju 87 D-3 with the Geschwader badge on the engine cowling, suggests that it was operating with one of the Eastern Front Gruppen when photographed.



One such machine restored to flying condition was this Ju 87 D-3 of 6./St.G 3.

The operational code S7+AH on this Ju 87 D, photographed in Tunisia, indicates that it was flown by the Staffelkapitän of 1./St.G 3. When originally found, this machine was still relatively intact and was standing on its undercarriage. Subsequently, however, it was stripped of components, part of the Hakenkreuz and most of the unit badge on the port side being the first items to disappear as souvenirs. The aircraft later became a source of spares so that other captured examples could be restored to an airworthy condition. Note the rear portion of the gunners canopy on the ground, forward of the starboard tailplane.





"strafing and dive-bombing" had been responsible considerably delaying the American advance. In fact, quite a hornet's nest had been stirred up by the "obsolete and outmoded" Ju 87.

The Ju 87s continued to be active during the battles of Feriana and Sbeitla, flying 360 sorties on just one day alone, 14 February, while *Fliegerkorps Tunis* maintained a sortie rate of 150 per day, which brought the American advance to a shuddering halt once more. The RAF historian commented:

"The German close-support in North Africa thus proved unexpectedly resilient and effective..." He added: *"Having regard to its limited size, it accomplished with success the tasks committed to it, maintaining a high average scale of effort at all periods of operational activity. From a force of the size allocated, (there were never more than about two score Stukas available at any one time), the German armies could not have hoped for more efficient support, and its history is a classic example of what may be accomplished, in the face of a superior enemy, by a small, compact force of high morale and efficiency, although outnumbered."*⁴⁰ This evaluation contrasts totally with some recent British accounts.

With the fall of Tunisia the *Dora*-equipped *Stab/St.G 3*, with *Oberstleutnant* Kurt Kuhlmei now its *Geschwaderkommodore*, moved first to Herzogenaurach and then down to Eleusis in Greece in June 1943. The *I./St.G 3*, with *Hauptmann* Horst Schiller as *Gruppenkommandeur*, also refitted and replenished at Herzogenaurach, then moved east in February to Kerch, before transferring to Megara in June 1943. Finally, *Major* Hamester's *III./St.G 3* refitted at Echterdingen and, under then under Hamester's successor *Hauptmann* Eberhard Jacob, went to the Eastern Front, initially based at Bryansk in June. It then took part in the bitter fighting at the Orel salient in July-August and later moved to Bagorovo.

The *Stuka* that never was – the Ju 87 F

In the spring of 1941 one of the lessons learned from operations over the English Channel the previous autumn was that the *Stuka* was underpowered. Junkers thought that the answer might be found by fitting a new model with their Jumo 213 A-1 in-line engine, which developed 1,775 hp. This would have given the new aircraft a great boost in speed, and, also, an entirely different profile. Unfortunately, a whole series of technical problems with the connecting rod bearing and the oil circulation were encountered in developing this new engine and the date of introduction had to be continually set back, with a prototype aircraft to be produced by 19 August 1942. This date then slipped back a year to August 1943 and again, later, to September 1944. Even then it was envisaged that the major output of the new engine would be allocated to the Ju 88 A, leaving only a small allocation for the planned Ju 87 F programme.

These photographs shows Fw. Qualo, a wireless operator/gunner with 10.(Pz)/SG 3, preparing for a mission in East Prussia in late 1944. The weapon is an MG 81Z and comprised a pair of 7.92 mm machine guns with a combined rate of fire of 3,200 rounds per minute. The Ju 87 Gs of the specialised anti-tank Staffeln remained in existence until the end of the war, but when other Ju 87 units converted to the single-seat Fw 190, the presence of the rear crew member was greatly missed. A few of these redundant wireless operators/gunners retrained as pilots, but the majority were sent to the front as ground troops.

⁴⁰ Air Ministry, *The Rise and Fall of the German Air Force*, op cit.

Dipl.-Ing. Flugkapitän Melitta Schenk Gräfin von Stauffenberg, maiden name Melitta Schiller

Melitta Schiller was born on 9 January 1903 in Krotoschin, in the Province of Posen, into a Jewish family whose business was trading in animal skins and the fur trade. In 1918 while living with her grandmother, she completed her intermediate education at a local girls school and in 1919 went to a high school for girls in Posen. After successfully passing her final examinations she went on to further education in Hirschberg, Silesia until 1922 when she entered a Technical High School in Munich studying a specialist branch of Technical Physics and Aerodynamics. By 1927 she had attained her diploma and also partly completed her studies into Flight Mechanics.

In 1927 she successfully attained a position with the *Deutschen Luftfahrtverband* in Berlin-Adlershof. On 1 May 1928 she attained her qualification as Dipl.Ing. and continued her studies into aeronautical research with the DLV where she worked amongst some of the best in the field. On 1 December 1928 she joined the Institute of Aerodynamics and in July 1929 went for pilot training to the *Deutschen Luftfahrt GmbH* in Berlin-Staaken. By September 1929 she had attained an intermediate pilot license for category 'A-1' aircraft (carrying up to 1 or 2 people) flying a Klemm L20 and by the end of 1930 had attained a full license to fly aircraft in categories 'A-1, A-2, B-1, B-2, C-1, C-2 and K-2' stunt aircraft. This meant she was qualified to fly virtually any kind of aircraft then in existence.

Between 1931 and 1932 she worked on the technical problems of variable pitch propellers and between 1935 and 1937 trained for blind flying with *Deutsche Luft Hansa* in Hannover and later in Breslau. On 31 July she carried out aerobatic flights with a He 70 in Berlin-Tempelhof. On 1 November 1936 she had also been engaged by the Askania Works, where as an engineer pilot, she tested flight instruments. On 9 November 1937 she was awarded the title of *Flugkapitän* (only the second woman after Hanna Reitsch to achieve this).

On 2 July 1938 she took part in a 'Küstenflug' from Königsberg to Wyk auf Föhr. In 1939 she married *Prof. Dr. Alexander Graf Schenk von Stauffenberg* and on 24 October that year had a duty posting to Section E7 at the *E-Stelle der Luftwaffe*



in Rechlin where she carried out bombing techniques and testing target aiming instruments. By October 1941 she had carried out many target diving test flights with the BZA bomb sights carrying four SC 250 bombs, with the aim of achieving greater accuracy.

Finally on 22 January 1943, after making 1,500 diving test flights (mainly flying the Ju 87 and Ju 88) she was awarded the Iron Cross Second Class for her achievements and bravery. On one occasion on 9 August 1943 during an exceptionally steep dive in a Ju 87 the cockpit canopy flew off. She had a minor mishap in a Ju 87 D on 16 November 1943 when on over breaking she tipped the aircraft on its nose. On 11 January 1944 she was awarded the Iron Cross First Class.

On 6 February 1944 she founded a research unit for the development of special flying instruments and was personally endorsed for leading this project by Hermann Göring. She was accepted as a member in the association of the *Amtsgericht* Berlin-Charlottenburg on 12 June 1944 and on 27 June had completed 2,507 diving flights plus 358 night flights.

She was arrested on 24 July 1944 on suspicion of being implicated in the July bomb plot on Hitler's life. She was released on 2 September 1944 as a 'prisoner with honour' under the direction of the *Reichsführer-SS* Heinrich Himmler who deemed that her work was of national importance.

In November 1944 she continued her work by carrying out testing night flying and landings with the *Versuchsstelle für Flugsondergerät* (Research Department for Special Equipment) in the *Technischen Akademie der Luftwaffe*. On 16 February 1945 was transferred from the Research Department in Berlin-Gatow to an area near Würzburg and then transferred again on 25 March to Weimar-Nohra.

Just before the end of the war on 8 April 1945, she was flying a Bücker Bü 181 coded BY+BL in the vicinity of Strasskirchen in Bavaria, when she was intercepted by a US fighter aircraft and although badly wounded in the attack, she was able to make an emergency landing but died several hours later. There can be little doubt that *Dipl.-Ing. Flugkapitän* Melitta Schenk Gräfin von Stauffenberg was an exceptionally gifted aeronautical scientist and flyer and can probably be credited with carrying out more dive-bombing flights than anyone else.

As then envisaged, under Delivery Programme 22, the Weser Aircraft Company was to produce the new *Stuka* at a steadily increasing rate, three in October 1944, six the following month, fourteen in December, twenty-five in January 1945 and forty in February, before finally hitting a monthly total of sixty-five Ju 87 Fs per month by March. This looked fine on paper in 1943, but by mid-February only seventy-five Jumo 213 A-0 and thirty A-1 engines had been produced and tested. Moreover, from the limited Ju 87 F allocation, one hundred Jumo 213 engines were re-allocated to the proposed new Fw 190 D and the numbers made up from the Ju 88 programme. Finally this all proved to be fantasy for the production of the Fw 190 F was considered more vital and in March 1943 the Ju 87 F order was finally cancelled.

Adriatic and Aegean victories

When the Italians capitulated to the Allies on 8 September, the German reaction in the Balkan region was both immediate and decisive. They quickly set in train a series of short, sharp actions, in which the role of the *Stuka* was dominant, and ensured a firm grip was retained over the whole Italian area. The 13./St.G 151 under *Oberst* Karl Christ, operated with II./St.G 3 which had flown in from Herzogenaurach at first, but quickly the *Stab* and III./St.G 3 under *Oberstleutnant* Bernhard Hamester, were brought in from the Russian Front to assist. The campaign coincided with the re-labelling of the *Stukageschwader* as *Schlachtgeschwader* under a general reorganisation, which took place on 18 October.

On 21 September 1943, the Italian garrison on the island of Cephalonia was overwhelmed by a German attack of brevity and ruthlessness. The Ju 87s, flying three sorties per serviceable aircraft, mounted 120 dive-bombing missions from their bases in north-west Greece and quickly eliminated the Italian artillery defences enabling the landing forces to get ashore and quickly take total control. Three days later they applied the same economy of force and content against the island of Corfu, which also fell. On 25 September the Ju 87s turned their attentions to the Italian artillery batteries at Split, Yugoslavia, and again the precision attacks led to the swift occupation of that port also, thus ensuring, in the space of a week, that the Adriatic's eastern shore remained secure and their supply routes south and east, intact.

Within another two days the *Stukas* were on the move again, this time across the Aegean to the strategic island of Rhodes. Again, a far larger Italian garrison was overthrown by a handful of Germans and by 27 September the St.G 3 was firmly established there, thus giving the Germans an aerial striking force in the heart of the area. Although the British, at Churchill's urging, (but with no enthusiasm and very little help from their American allies), landed troops on the islands of Cos, Leros and Samos, these garrisons were outflanked and had to be maintained, supplied, reinforced and, within a short while, evacuated, under the *Stuka's* watch. The results were: "...models of what a small but intrepid air command could achieve against an irresolute opponent without air support."

The only fighter base available to the Allies was at Cos, and this was quickly captured in a two-day battle, with the Ju 87s contributing the main effort, mounting 150 combat sorties on 3 and 4 October. Then it was the turn of the principal Allied base and port, the island of Leros to receive the *Stukas* close attentions.

In order to supply the British and Italian garrison on Leros, and also attempt to intercept and destroy German assault convoys before they could land their troops there, British naval forces were once more committed to conduct operations deep within enemy waters without any air cover. The result was yet another duel between the *Stuka* and the Royal Navy, with fairly predictable results.



A formation of Ju 87 D-1s returning from a mission.

Ju 87s versus the Royal Navy : the final duel – Aegean Campaign September -October 1943 ⁴¹

Ship	Type	Date	Fate	Area
<i>Penelope</i>	Cruiser	7 October	Damaged	Scarpanto Strait
<i>Carlisle</i>	Cruiser	9 October	Written off	Scarpanto Strait
<i>Sirius</i>	Cruiser	17 October	Damaged	Scarpanto Strait
<i>Aurora</i>	Cruiser	30 October	Damaged	Off Casteloriso
<i>Panther</i>	Destroyer	9 October	Sunk	Scarpanto Strait
<i>ML.835</i>	Motor Launch	11 October	Sunk	Levitha
<i>MTB 313</i>	Motor Torpedo Boat	17 October	Damaged	Casteloriso
<i>ML 579</i>	Motor Launch	26 October	Sunk	Off Lipso
<i>LCT 115</i>	Landing Craft (Tank)	28 October	Sunk	Casteloriso

Throughout October and early November, an average of sixty sorties per day were mounted against Leros, with once more, the defending artillery batteries, anti-aircraft gun emplacements and fortifications as the priority targets.

⁴¹ From Peter C Smith & Edwin R. Walker, *War in the Aegean*, William Kimber, London, 1974

Scale of Luftwaffe air attack on Leros in the period 26 September-31 October 1943

Date	Sorties	No of aircraft
26 September	2	25
27 September	1	30
29 September	3	60
30 September	3	60
1 October	6	46
4 October	4	50
5 October	5	79
6 October	5	78
7 October	5	80
8 October	4	18
9 October	6	29
10 October	3	76
11 October	3	24
12 October	8	62
14 October	3	65
15 October	10	34
16 October	11	76
17 October	7	28
18 October	2	28
19 October	6	24
20 October	2	28
22 October	11	44
23 October	5	47
24 October	4	15
25 October	4	16
26 October	11	50
27 October	4	16
30 October	1	5
31 October	1	6

Thus softened up, the Germans duly launched their invasion, by both land and air. In fact, despite the common, but totally inaccurate, assertion that Crete was the last major German airborne operation of the war, the invasion and overrunning of Leros between 12 and 17 November 1943 proved to be a remarkably efficient and effective re-play of that battle of two years earlier.

A British war journalist gave this account of the actual invasion:

*"I scoured the sky and saw four specks resolve themselves into Stukas, our first aerial visitors of the day. The Italian coastal batteries now opened up in earnest, their shells churning up the sea all around the invasion craft. I was standing beside a sturdy, sandy haired sergeant of the RIF [Royal Irish Fusiliers] who was staring intently through glasses. He turned and remarked that if only we had the Malta gunners on the island they would blow the whole adjectival lot out of the way in no time. Just as the Stukas approached nearer the AA defences of the island began to join the chorus plastering the sky with expanding black and white blobs. The Stukas, in no way inconvenienced by the AA fire, cruised round and round overhead seemingly in no hurry. I conjectured that the Hun intended to use them as flying artillery sending them over in constant relays and waiting for signals from the ground before bombing. It was an infuriating reflection that the Stuka dive-bomber was regarded in the RAF as obsolete. Yet here, because of the lack of fighter opposition, the enemy was preparing to use them again as in the battle of France."*⁴²

The fight lasted four days, during which the Luftwaffe, and principally the Ju 87s, made less than seven hundred sorties. It was to be the Stuka's last major victory.

⁴² L. Marsland Gander, *Long Road to Leros*, (London, 1945)



Oberst Hubertus Hitschhold during a visit to Schlachtgeschwader 2 in 1944. When Oberst Kupfer was killed in a flying accident in November 1943, Hitschhold replaced him as General der Schlachtflieger. Only with the creation of this appointment were all ground-attack units brought under a single control. Consequently, the proper evaluation of operational experience, forward technical planning, improved cooperation with the Army, the coordinated training of ground attack pilots and the conversion from the Ju 87 to the Fw 190 were tasks which were all begun too late. In this photograph, Hitschhold is seen with the Staffelführer of 6./SG 2, Hptm. Günther Bleckmann, second left, and other officers of II./SG 2. Bleckmann was killed when his Fw 190 caught fire and crashed in June 1944, only days after he had been awarded the Ritterkreuz.



Once the Ju 87 units were brought under the control of the General der Schlachtflieger, a new Frontflugspange was instituted in April 1944. By this time, as some aircrew had far exceeded the 110 war flights necessary for the Frontflugspange in gold, it was felt that a modification to the Frontflugspange was required to reward and recognise these missions. At first, a star pendant was added, but as this did not show the numbers of operations flown, a new pendant was added with a number ranging from 200 to 2,000. The example shown is the Frontflugspange for Schlachtflieger in gold with a pendant for 600 missions flown. (Martin Pegg collection)

From November 1941, Luftwaffe flying personnel qualified for the award of the Frontflugspange, or War Flight Clasp, in bronze, silver or gold, depending on the number of operational sorties flown. On average, 20 operational flights were required for the bronze, 60 for the silver and 110 for the gold. At first, as Ju 87 crews were part of the bomber force, they qualified for the Frontflugspange für Kampfflieger, as shown here in silver. (Martin Pegg collection)

On the back foot – collapse in the East

Following the failure of the German attack at Kursk and the Soviet thrust which took Kharkov on 23 August 1943, with the resulting loss of strategic airfields the defence of the Dnieper river line faltered and the bulk of the *Stukas* were forced to relocate to bases in the Dnepropetrovsk, Kremenchuk and Mirgorod areas. The enemy then shifted the axis of his advance northward and four days later moved against the Donets Basin between Stalino and Taganrog, the latter falling on the 30th. At once resources had to be switched from VIII. *Fliegerkorps* holding the Kharkov to Poltava section of the front, to IV. *Fliegerkorps*. As a result, the Soviets, with ample reserves of manpower, simply moved the attack again, taking Bryansk and Smolensk during September. The bare fact was that the *Luftwaffe* had too few resources to hold the whole front and was always reacting to the enemy pressure with the same dwindling resources.

The dismal story continued throughout October, with the *Stuka* units moving bases to keep up with the enemy thrusts. Often they inflicted bloody local defeats on the enemy armour spearheads, but the strain was immense and the general picture remained one of continued withdrawal.

On 18 October, many of the *Sturzkampfgeschwader* were re-named (and in some cases entirely re-numbered) as *Schlachtgeschwader* under the general re-organisation of ground-attack units which grouped dive-bombers, fighter-bombers and specialised ground-attack and tank-busting aircraft together, although this on-paper administrative change meant little at the front where units fought on exactly as before.



The enemy's anti-aircraft defences, which included AA guns mounted on tracked chassis so that they could accompany Soviet armoured breakthroughs, were greatly respected by the Schlachtfieger. Here, a Ju 87 D-5 armed with AB 500 containers is flying through Soviet anti-aircraft fire.

A Ju 87 D-5 coded T6+AS, assigned to the Staffelkapitän of 8./SG 2, Hptm. Hendrik Stahl, in 1944. Note the yellow gaiters over the undercarriage oleos and the yellow tip to the rudder.





Fahnenjunker-Feldwebel Hans Meyer of 8./SG 2, seen centre, holding a commemorative certificate, completed his 500th war flight on 31 May 1944. Acknowledged as a pilot with the ability to carry out very accurate bombing missions, he was credited with destroying 40 tanks, 50 gun positions and 100 lorries and other vehicles as well as a number of bridges, ammunition dumps and supply trains. He was later awarded the German Cross in Gold and the Ritterkreuz, and survived the war having flown over 600 sorties. The officer second right wearing the Ritterkreuz is Oblt. Hendrick Stahl, the Staffelführer of 8./SG 2, who was later decorated with the Oak Leaves and flew more than 1,200 war flights.



Probably also photographed in the summer of 1944 was this heavily-loaded Ju 87 D-5 of Stab I./SG 1. Just visible aft of the fuselage Balkenkreuz is an area where the original A5 lettering had been painted out and replaced by smaller lettering.

Unit	New Designation from 18 October 1943	Location
Stab/St.G 1	Stab/SG 1	Bobruisk
I./St.G 1	I./SG 1	Mogilev
II./St.G 1	II./SG 1	Bobruisk
III./St.G 1	III./SG 1	Bobruisk
Stab./St.G 2	Stab/SG 2	Pervomaisk
I./St.G 2	I./SG 2	Pervomaisk
II./St.G 2	Disbanded 7 March 1944	-
III./St.G 2	III./SG 2	Pervomaisk
Stab./St.G 3	Stab./SG 3	Eleusis
I./St.G 3	I./SG 3	Megara
II./St.G 3	II./SG 3	Marizza
III./St.G 3	III./SG 3	Bagerovo
Stab/St.G 77	Stab/SG 77	Wassilkow
I./St.G 77	I./SG 77	Lemberg
II./St.G 77	III./SG 10	Vasilkov
III./St.G 77	III./SG 77	Kirovograd
Stab/St.G 151	Stab/SG 151	Pancevo
I./St.G 151	I./SG 151	Agram
II./St.G 151	Disbanded 18 October 1943	Agram
III./St.G 151	III./SG 151	Athens-Tatoi
IV./St.G 151	II./SG 151	Pancevo

Ju 87 Order of Battle 18 October 1943 (All Stuka Gruppen having been re-designated)

Luftflotte 1

1. & 3.Stab/SG 5	Ju 87	17	(14)
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Luftflotte 4

SG 1	Ju 87 (<i>jointly with Luftflotte 6</i>)	88	(53)
SG 2	Ju 87, Fw 190	84	(49)
III.Gruppe/SG 3	Ju 87	19	(8)
IV.(Pz)Gr./SG 9	Hs 129 (<i>less 13. & 14.Staffeln</i>)	30	(15)
13. & 14./SG 9	Hs 129	23	(20)
Stab/SG 77	Ju 87	4	(3)
I.Gruppe/SG 77	Ju 87	41	(31)
II.Gruppe/SG 77	Ju 87	20	(14)
III.Gruppe/SG 77	Ju 87	42	(36)
II.Gruppe/St.G 2	Ju 87	9	(8)

Luftflotte 6

SG 1	Ju 87 (<i>see Luftflotte 4</i>)		
10.(Pz)Sta./SG 77	Ju 87	8	(7)
All units of the Nachtschlachtflieger apart from NSG 7		242	(174)

The Russian attack from the Dnieper River at Kremenchug toward Krivoi Rog in the Ukraine, which was a mining area but also contained one the largest *Luftwaffe* supply bases, and was vital as a rail and

² Helmut Mahlke to the author, 12th January 1977.



Ju 87 R-2s of I./St.G 3. When this Gruppe was formed in July 1940, it was allocated the operational code S1, although most other parts of the Geschwader were allocated the code S7. Shown in the centre of this photograph, probably taken in Greece in 1941, is S1+AB, a Ju 87 R-2 flown by the Kommandeur, Major Walter Sigel.



Junkers Ju 87 D-5 of 10 (Pz)./SG 3, Latvia, August 1944

This Ju 87 was camouflaged in the standard 70/71/65 scheme and carried the code S7+ST with the aircraft letter S in yellow. The Staffel letter T is unusual, the standard letter for the 10. Staffel being a U, but the application of a spiral only to the forward part of the spinner was quite a common feature. Note the blister housing the gun/bombsight above the windscreen, the two thin white stripes on the rudder and the code S7 in grey.



Two views of a Ju 87 D-5 preparing for a sortie on the Eastern Front, probably in the summer of 1944. Note the MG 151 cannon in the wings and the bulged Plexiglas fairing for the repositioned gun and bombsight above the windscreen. The D-5 also had the facility of jettisoning its undercarriage in an emergency by detonating explosive bolts which connected them to the main spar.





An Fw 190 provides a formation of Ju 87 Ds with fighter protection. As the air war in the West intensified, more and more fighters were withdrawn from the Eastern Front for Home Defence. The remaining fighters in the East were then frequently required to protect the Ju 87s rather than carry out freelance fighter sweeps against the VVS.

communications centre, commenced on 20 October. It was halted by the *Luftwaffe* which conducted 1,200 combat sorties a day. The III./SG 1 led by Major Friedrich Lang featured prominently during this hard fighting, flying exclusively the new Ju 87 D-5. After three large armoured contests, the *Gruppe* pushed the Soviets back for thirty-two kilometres. However, the enemy was strong enough to mount hammer blows elsewhere, resulting in the fall of Kiev on 6 November, and also striking toward Zhitomir. Again the *Stukas* were moved up from the Dnieper bend to spearhead a German counter-attack, which reversed some of the Soviet gains, but left an enormous salient, which threatened the German foothold on the Black Sea littoral.

The effects of the constantly shifting enemy pressure and the re-organisation can be shown in the movements of the various *Stuka*-equipped units during this period. The II./SG 1 worked successively out of Baranovichi, Mogilev and Bobruisk and had twelve picked aircrews trained for night combat, a foretaste of things to come. The I./SG 1 initially had a mixed complement of *Dora*-1s and -3s and even a few *Berthas* remained on its strength for a while. Under the command of Major Horst Kaubisch this unit was also switched from crisis point to crisis point, initially flying from Bobruisk, then Mogilev and Luniniec under *Luftflotte* 6, then transferring to Biala-Podlaska. The *Stab*/SG 2 led by Oberstleutnant Hans-Karl Stepp, remained with I. *Fliegerkorps* during this period, with its base staying at Nove Krasnoye until 12 March, when it moved to Ljubaschewska, Rauchovka and then to Rasdelnaju. By April the unit was still flying *Stukas* from Husi but beginning to re-equip with the Focke-Wulf Fw 190. The I./SG 2, led by Hauptmann Alwin Boerst, likewise remained at Pervomaisk until mid-March 1944, when it moved down to Nikolayev, Rauchovka and Tiraspol before joining the others at Husi. Conversion to the Fw 190 commenced at Görgenyarozsfalu in June. The only element from SG 3 to fight on the Eastern Front at this period was the III. *Gruppe*, which, after the Tunisian Campaign, had been refurbished at Echterdingen and then moved to Bryansk and into the Orel salient during June and July. Led by Hauptmann Bernhard Hamester and then Hauptman Eberhardt Jakob, at the time of the redesignation to *Schlachtgeschwader*, was flying *Doras* and continued to do so. The dive-bombers were operating under *Luftflotte* 4 in the south working from Karankut, Petserir and Chersonese in the Crimea, before falling back to Rumania where it was based at Focsani.

The 'Luftwaffe's Fire Brigade'⁴³, the redoubtable St.G 77, under Major Helmut Bruck, was likewise re-designated on 18 October, and at that time was still flying mainly *Dora*-3s, with only a few -5s operational with 1. *Staffel*. It still formed the mainstay of IV. *Fliegerkorps* in the south. The I./SG 77 was at Krimea, west of Krasnograd from the end of August, but was forced to shift back to Poltava on 10 September. From here it was heavily committed, relentlessly flying four or five missions each day. It then shifted to via Kiev-West to Vasilkov where it took part in numerous strikes against Soviet tanks and vehicles during the Krivoi-Rog battles. The II. *Gruppe*, led by Hauptmann Alexander Glässer had a 5. and 6. *Staffeln* added by transfer from *Schlachtgeschwader* 1 and another from I./SG 4 joined a month later. By January 1944, the unit was flying from Kalinovka, before shifting base to Lemberg and

⁴³ For the origins of this term, and the full history of St.G 77, see Peter C Smith, *Stuka Squadron; Stukagruppe 77 – the Luftwaffe's 'Fire Brigade'*, PSL, Wellingborough, 1990.

Ground personnel arming a Ju 87 D-5 of I./SG 1 in the East in late 1943 when the Gruppe was operating in the Bobruisk area under I. Fliegerdivision.



Hptm. Alwin Boerst, in the centre, the Kommandeur of I./St.G 2, celebrating his 800th mission at Orel-West, shortly after midday on 25 July 1943. Boerst was awarded the Ritterkreuz on 5 October 1941 as an Oberleutnant after 300 operational flights, and received the Oak Leaves as a Hauptmann on 28 November 1942 after 600 operations. He and his faithful radio operator/rear gunner, Ofw. Ernst Filius, were killed while attacking Soviet armour on 30 March 1945. This crew, which had flown together since June 1938, had exactly 1,050 missions each to their credit when they were killed. They were subsequently buried together in a communal grave, and while Boerst was posthumously promoted to Major and awarded the Swords, Filius was awarded a posthumous Ritterkreuz.





A well-weathered Ju 87 D-5 of Stab SG 1 in Russia in the winter of 1943/44. The practice of the various parts of a Geschwader using different codes was quite widespread, and apart from Stab SG 1 using A5, loss reports from October/November 1943 show that while the remainder of I./SG 1 was using the code L1, II./SG 1 was using 6G and III./SG 1 the code J9.



Junkers Ju 87 D-5 of Stab SG 1, Russia, Winter 1943/44

This particular machine was coded A5+KJ and had the original 70/71 uppersurface scheme overpainted with a white winter camouflage. Undersurfaces were RLM 65 with yellow wingtips, and the unusual style of the letter J and sudden termination of the heavy exhaust staining just forward of this suggests some recent repainting when the aircraft lettering was changed.

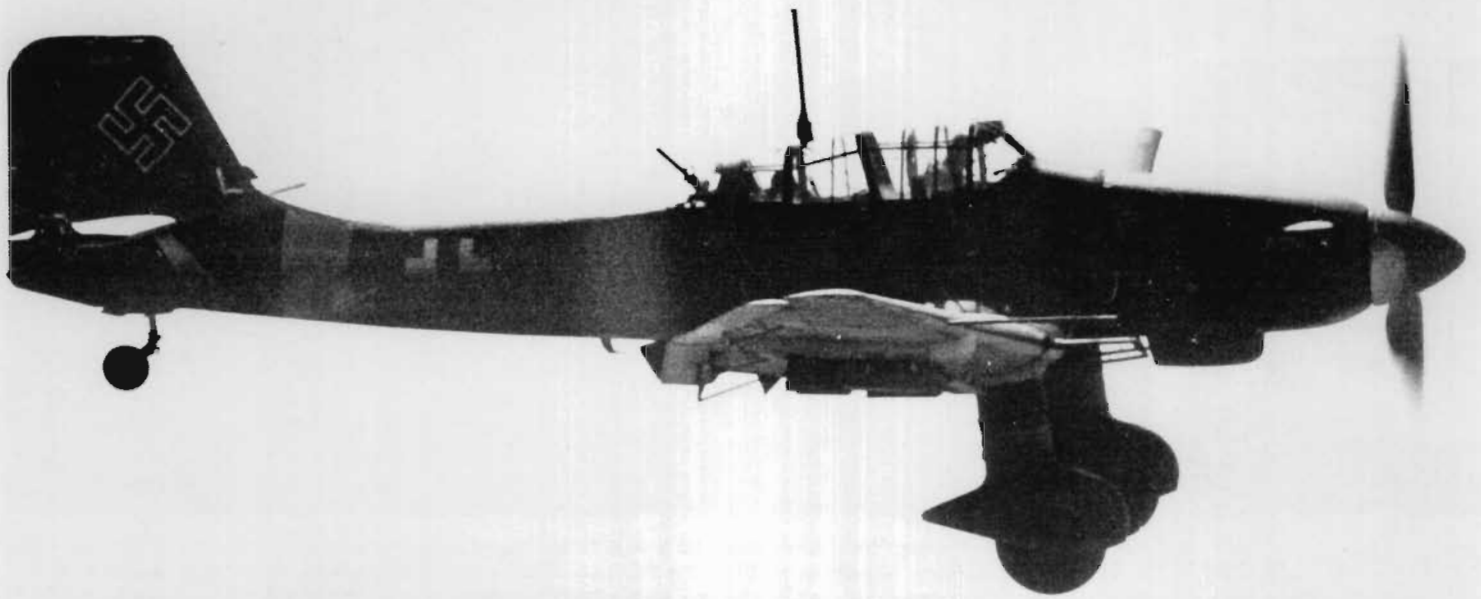


Above and opposite page bottom: Junkers Ju 87 D-5s of 1. Staffel SG 1 flying in close formation. These two photographs were taken a little later than the preceding one and show the winter camouflage in a more advanced state of weathering. Although all the photographs show aircraft of the same Staffel, there are variations in the styles of spinner decoration and yellow fuselage band. The 1. Gruppe of SG 1 operated from Bobruisk in central Russia until March 1944 when it withdrew to Luniniec in eastern Poland. The Gruppe continued to fly the Ju 87 D until November 1944, when it moved to Schönfeld-Seifersdorf in order to convert to the Fw 190.



Junkers Ju 87 D-5 of 1./SG 1, Russia, early 1944

This aircraft had a weathered, white winter finish over the original 70/71splinter pattern, this also covering the normal yellow band around the rear fuselage. The individual aircraft letter, a white F neatly outlined in black, was repeated under both wingtips, and the unit code, L1, was in the reduced size first introduced in 1943.



Some Ju 87 D-5s were fitted with a new gun/bombsight which was mounted on the top of the windscreen and accommodated in a blister at the top of the windscreen. The sight and blister may be seen in this photograph of a Ju 87 D-5 on the Eastern Front in 1944.



Another view of Junkers Ju 87 D-5 of 1/SG 1 (opposite page) in flight, showing to good effect the well worn winter camouflage over the 70/71 splinter pattern.



Josef Blümel flew his first operations in April 1944 with the 10.(Pz)/SG 3 and became an expert in destroying Soviet tanks, being credited with 34 by 28 July 1944. On 17 September, he destroyed his 59th and on the 19th, destroyed his 60th tank. However, in another sortie flown on the same morning, his aircraft was damaged by enemy machine gun fire and Blümel was obliged to make a forced landing near Kekava, 18 km south of Riga, in Latvia. Captured by Soviet troops, Fw. Blümel and his radio operator, Ogfr. Hermann Schwärzel, were each executed with a shot through the back of the neck. Three days later, a German search party located their crashed aircraft (655) and recovered the bodies of the crew. They were buried with full military honours and on 1 January 1945, Blümel was posthumously awarded the German Cross in Gold and the Ritterkreuz.



When Soviet forces mounted a heavy attack in Finland on 9 June 1944, the Finns called for German assistance. The Germans' reaction was to raise a Battle Group, Gefechtsverband Kuhlmeier, at Petseri in Estonia comprising I./SG 3, with 23 Ju 87 Ds, supported by parts of JG 54 with Fw 190s and the similarly equipped I./SG 5. This sequence of photographs was taken in June and July 1944, when the Gefechtsverband played a decisive role on the Karelian Isthmus under conditions of enormous enemy numerical superiority. The Ju 87 D-5 shown here was coded S7+DB and was flown by Stab I./SG 3.

then to Krasno, Pinsk, Moderovka and Jasionka as the German central front collapsed. It then abandoned the bulk of its *Stukas* for the Fw 190 *Jabo*. Finally, III./SG 77, under *Hauptmann* Franz Kieslich continued to operate from Bobruisk from May 1943 onward.

Establishment of the *Schlachtgeschwader*

Following the suicide of *Generaloberst* Hans Jeschonnek, the post of Chief of the *Luftwaffe* General Staff passed to *Generoberst* Günter Korten who, on 5 October, issued *Oberkommando de Luftwaffe* 2. *Abteilung* Order No. 11125/43, establishing the new *Schlachtflieger* command, which combined under one control, all the close-support units. He appointed *Oberstleutnant* Dr Ernst Kupfer to the new post of *General der Schlachtflieger*, but, due to his death soon after, *Oberstleutnant* Hubertus Hitschhold succeeded him in November.

One of the longer-term affects of this change was the slow phasing-out of the Ju 87, now a seven-year old design, and its replacement by the Focke-Wulf Fw 190, an event long predicted. Yet this did not happen overnight. From January 1944 onward, the re-equipping of the *Schlachtgeschwader*, still mainly flying *Doras*, with the Fw 190 meant disruption while pilots were retrained for the new aircraft and the rear-seat men were assigned new duties, some of whom became pilots, which were now at a premium. The total re-equipping took a year to implement fully; III./SG 3, for example, did not convert to the Fw 190 until May 1944 at Pardubitz. Indeed, some units were still flying combat sorties with the few Ju 87s remaining on their fighting strength in front of Berlin and at the end of hostilities in May 1945.

Ju 87 *Schlachtgeschwader* conversion to Focke-Wulf Fw 190

Unit	Conversion Date	Commander	Base
<i>Stab</i> /SG 1	April 1944	Major Peter Gassmann	Wilna
I./SG 1	November 1944	Major Horst Kaubisch	Schönfeld-Seifersdorf
II./SG 1	May 1944	Major Ernst-Christian Reusch	Wilna
III./SG 1	March 1944	Major Friedrich Lang	Wilna
<i>Stab</i> /SG 2	April 1944	<i>Oberstleutnant</i> Hans-Karl Stepp	Husi
I./SG 2	June 1944	<i>Hauptman</i> Kurt Lau	Gürgenyarossfalu
III./SG 2	December 1944	Major Lothar Lau	Fürstenwalde
<i>Stab</i> /SG 3	July 1944	<i>Oberstleutnant</i> Kurt Kuhlmei	Dorpat
I./SG 3	August 1944	<i>Hauptman</i> Helmut Naumann	Pardubitz
II./SG 3	June 1944	<i>Hauptman</i> Theodor Nordmann	Jakobstadt
III./SG3	April 1944	<i>Hauptman</i> Heinz Hamester	Chersonnes
<i>Stab</i> /SG 77	March 1944	Major Helmut Bruck	Lemberg
I./SG 77	June 1944	Major Karl Henze	Jasionka
III./SG 77	July 1944	<i>Hauptman</i> Franz Kieslich	Grojek
<i>Stab</i> /SG 151	January 1944	<i>Oberstleutnant</i> Karl Christ	Pardubitz
I./SG 151	January 1944	<i>Hauptmann</i> Karl Schrepfer	Alibunar
II./SG 151	February 1944	<i>Hauptman</i> Heinrich Heins	Gross Beckerek
III./SG 151	March 1944	<i>Hauptman</i> Egon Stoll-Berberich	Pardubitz

Final battles in Finland

By 1944, most of Germany's allies were in no doubt of their predicament, and were secretly plotting to desert the Axis and make separate peace with the Soviets on the best terms they could. Finland was no exception. However, the initial terms offered the Finns were so bad that they were rejected and a grand Soviet offensive began across the narrow Karjala Isthmus with ten-to-one superiority in all arms on 9 June. The Finnish Army was swamped and some panic broke out, resulting in the fall of Viipuri almost immediately. The Germans immediately came to the aid of their reluctant ally and I./SG 5, equipped with both Ju 87s and Fw 190 *Jabos*, was swiftly moved to the airfield at Immola, on 16 June, as part of *Major* Kurt Kuhlmei's air detachment operating under overall command of *Oberst* Lorenz.

It arrived just in time to take a vital part in the ensuing Battle of Tali-Ihantala, as the confident Soviets attacked again on 25 June, aiming for Helsinki via Lappeenranta and Imatra. Again the Finns conducted a fighting withdrawal stage-by-stage, but this time gave a good account of

themselves. The bottleneck through which the enemy was trying to bulldoze his way lent itself to defence, and I./SG 5's thirty *Stukas* were once more able to demonstrate their inherent accuracy, by smashing the vital strategic bridges of Tali-Ihantala, east of Viipuri, repeating the attack each time the Soviets repaired them. This broke the only supply route of the invaders. The *Stukas* also gave vital support to the Finnish counter-attack of 3 July.

It was acknowledged by the Finns themselves that the support given during the five weeks the *Stukas* operated on this front, saved the nation, and, in their words, proved to be 'one of the decisive elements of the battle.' An eyewitness account of the morale effect the Ju 87 still had, even at this stage of the war, was later reported thus:

*"A Finnish veteran writes how they'd been in their foxholes, enduring a Soviet artillery barrage which then stopped – which meant that either a Soviet assault or Soviet bombers were coming. And aircraft engines were heard, which meant cowering even deeper into their positions. But this sound came from behind them. Watching above the tired Finnish soldiers saw unfamiliar shaped airplanes flying over them, over to the Soviet side and starting a vertical dive – with the 'Jericho sirens' screaming and bombs whistling downwards. They're Stukas, they're Stukas!', the dirty men cried, as they climbed out of their foxholes, danced, threw their helmets and caps in the air and cried in joy."*⁴⁴



An elderly and rather weatherbeaten Ju 87 R-2 of I./St.G 5 in northern Finland in March 1943. Although formed from the elite IV.(Stuka)/Lehr-geschwader 1, I./St.G 5 did not receive the improved D-1 and D-3 versions until March 1943.

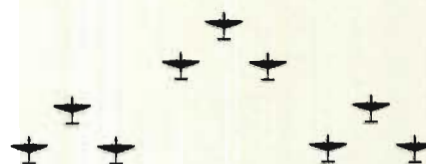
The same weathered Ju 87 R-2 of I./St.G 5 provides the background to this photograph showing various officers in conversation. In the centre, wearing the Ritterkreuz, is General der Infanterie Karl Weisenberger, the commander of XXXVI. Gebirgs-Korps, while next right is Obstlt. Gotthardt Handrick, the Kommodore of JG 5.



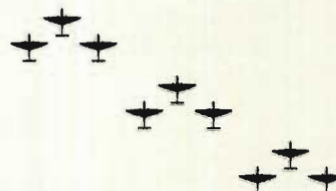
⁴⁴ Helsingin Sanomat 28 June 2000.

STUKA FORMATIONS ON APPROACH TO TARGET

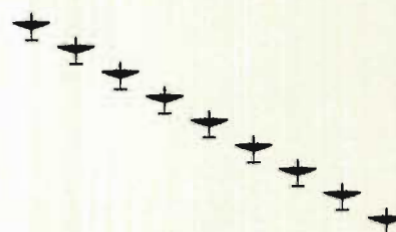
1 Staffel on way to the target - loose formation, based on 'Kette' of three aircraft (leader and two 'chained dogs': Ketten-hunde').



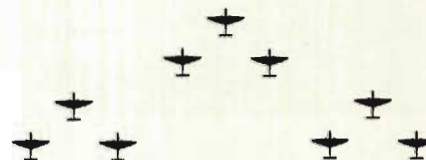
2 Staffel shortly before the target, closed up in defensive formation still based on 'Kette'.



3 Staffel at the start of the attack, stepped up in echelon formation, just before the dive.



4 Staffel leaving target, in the same formation as that in which it approached.



Attacks were flown in Kette (3), Staffel (9), Gruppe (30), and Geschwader strength (93).



An elderly and rather weatherbeaten Ju 87 R-2 of I./St.G 5 in northern Finland in March 1943. Although formed from the elite IV.(Stuka)/Lehrgeschwader 1, I./St.G 5 did not receive the improved D-1 and D-3 versions until March 1943.



Here the leading aircraft may be seen in the distance already making a shallow dive towards the objective, while the lead aircraft of the Kette on the right has just begun to bank to the left in order to follow them down. With the aid of Gefechtsverband Kuhlmei, the Finns succeeded in halting the Soviet advance and the Ju 87s flew their last mission on 17 July.



Coded S7+HH, this Ju 87 D-5 belonged to 1./SG 3.



Above and opposite page: Another variation of the winter scheme is seen on a Ju 87 D-5, believed to be a machine of SG 2, in the winter of 1943/44. The camouflage has been applied with the aid of a spraygun in a white meander pattern which also included the spinner and propeller blades. The aircraft is armed with SD 250 bombs fitted with extended fuses under the wings and an AB 500 container under the fuselage.

The aircraft shown here belonged to 5./SG 3 and shows again the black segments of the outline style Balkenkreuz as well as the unusually high placement of the S7 code of SG which was typical of this Geschwader. It is not known whether the highly decorated NCO about to collect the parachute resting on the port tailplane was the pilot or radio operator/gunner, but he wears the German Cross in Gold and has the Afrika cuff band on his left sleeve.







The *Nachtschlachtgruppen* were formed in October 1943 from the *Störkampfstaffeln*, night harassing units which employed slow biplanes and were sorted to be a continual nuisance to the enemy at night. Losses were relatively light and, after the *Nachtschlachtgruppen* had been equipped with the Ju 87 and staffed by crews especially trained in the skills required for successful night ground attack, the *Nachtschlachtgruppen* were able to provide effective support for the Army. This Ju 87 D-5, V.Nr. 100323, flew in from the Eastern Front to US forces at Stuttgart-Echterdingen on 8 May 1945. Note the yellow tactical markings on the nose, rudder and port wing.

Whether these Ju 87Ds were fitted with the 'Trombone of Jericho' this late in the war is doubtful, but that they dropped bombs which had cardboard whistles attached to their tails was attested by several sources. However they achieved it, by halting this crucial offensive, the Ju 87s, with the loss of only five of their number, had an enormous effect on the war, out of all proportion to their tiny numbers, and yet such achievements are rarely recorded in the West.

***Nachtschlachtgruppen* – the last throw.**

Night-attack missions had been an element of *Stuka* operations since 1940 and specialist equipment to facilitate such operations had steadily been developed. As early as July 1942, flame eliminator pipes (*Flammenvernichter* or FlaV) had been successfully tested at the Junkers factory and were considered as retrofits for the existing *Bertha* and *Richard*, as well as a limited new-build requirement for the *Dora*. However, the GdS first General der Schlachtflieger, *Oberst Dr. Kupfer*, requested the formation of night harassment *Staffeln*, taking a leaf from the Soviet's book, and, from the autumn of the same year, the setting up of so-called Auxiliary (*Hilfs*) *Staffeln* had been initiated. Twelve such *ad hoc* units were established, and equipped with a motley variety of obsolete aircraft, and were found to be useful additions against both the main Soviet armies and the growing numbers of back-area partisan forces. Although the actual bomb loads they could deliver were small, their total effect, both on the infrastructure and on enemy morale, was found to be quite large, and they gave some relief to the German troops on the ground also. Therefore on the death of Kupfer, his successor, another committed *Stuka* man, *Generalmajor* Hubertus Hitschold, not only continued this policy, but, with the appointment of *Major* Boris von Maubeuge as Inspector of all *Nachtschlacht* units, actively sought to intensify it.

By the last year of the war, the Ju 87 D-1, -3 and -5s with which most ground-attack units were armed, were converting to the Fw 190 F *Jabo*, which sacrificed armour and resilience for speed while toting much the same bomb-load. This left a large stock of relatively new *Stukas*, many of the more recent carrying MG 151/20 cannon, fitted with flash eliminators, which proved most suitable in the ground-attack role, and capable of carrying the new range of weaponry developed for such attacks. For attacks on artillery and armour as well as infantry and motor vehicle targets, these included wooden bomb containers of the AB 70, 250 and 500 range, which could carry a whole range of armour-piercing and fragmentation ordnance: SD -1, -2, -4, -10, -15 and -70 and the French 270-kg bombs.

45. This set had a measuring range of between 0 and 15000m. It comprised an S 101 transmitter, an E 101 receiver and a U 101 transformer; with a total weight of 9.9Kg. There was an AFN 101 display unit, an EGS 101 transmitter housing, an EGE 101 receiver housing, an VD 101a distributor box for the transmitter with RB 10 attachment rubber and a Lis 12b instrument plug socket. The split display was in two halves, 0-150 at the top and 100-1500 at the bottom. It worked between 22 and 30 volts, with the 24 volt onboard net as its source. The wavelength was between the range of $f = 75\text{cm}$ to 89 cm with a frequency of $f = 400\text{ MHz}$ up to 337 MHz . The transmitter utilised three tubes, an RV 12 P 2001, an LD2 and LV 5 as a receiver, with a ST V 280/40 stabiliser.



Junkers Ju 87 D-3, 2./NSG 2, Byelorussia, May 1944

Flown by *Ofw.* Toni Fink and *Fw.* Hans Nawroth on one of their last missions before transferring to Italy. The two-tone green splinter camouflage, pale blue undersides and yellow band are typical of Ju 87s on the Eastern Front. *Staffel* aircraft had white tail numbers, repeated on the port wheel spat (in this case removed). The white unit code and white-tipped spinner are derived from another, contemporary Ju 87 of the *Gruppe*; the red individual letter outlined in white is provisional.

Conversion of some three hundred *Dora* and *Gustav* 1s for night operations involved specialised equipment. This varied according to the original mark; with the adoption of the FuG 101 radio altimeter set⁴⁵ and a FuG 8a communications set in NSGr 9, while others had an additional FuG 16Z VHF transmitter/receiver set, with rear mounted aerial which supplemented the FuG 25 IFF radar. The conversions also saw the replacement of the *Revi* C12D or 16D sight by the *Nachtrevi* (Night reflector sight) C12N and 16/D/N respectively. Flash eliminator extensions were also fitted to the rear-seat man's MG 81 Z, and this could be done in the field. The cockpit was darkened and ultra-violet substituted for instrument illumination, while externally, a front-facing but rotating D/F loop replaced the fixed one and two extra aircraft recognition lights were shipped. A full conversion took about sixty hours according to type. All the dive-flaps were removed and a Jumo 211-P engine fitted, along with flame dampers to the gun muzzles and exhaust stubs. They were also repainted with a new lacquer finish. In total some three hundred D-3 and D-5 aircraft were so modified, most of the conversion work being carried out in late 1943 and early 1944 at the *Metallwerk Niedersachsen, Brinkmann und Mergell (Menibum)* at Harburg, Hamburg⁴⁶. Blohm und Voss modified twenty-three *Nachtschlacht* from July 1944.

As well as modifications to the *Stuka*, a certain specialist training programme was initiated for the aircrew at Stubendorf, Oppeln, which involved night navigation, low-altitude night flying and instrument landings. Candidates found suitable were issued with the Blind Flying Certificate 3, but not everyone was found suitable for this type of mission.

Re-equipping of the *Nachtschlachtgruppen* with the Ju 87 proceeded apace from May 1943 onward, but at a slow rate, and it was not until early 1944 that the majority of such units had converted to the



*Oberst Dr. Ernst Kupfer, who requested the formation of a night harassment *Staffeln*, taking a leaf from Soviet operations.*

⁴⁶ See Interrogations of captured aircrew contained in the following files at the National Archives, Kew, London. AIR 40 -- Air Ministry, Directorate of Intelligence and related bodies: Intelligence Reports and Papers; AIR 51 -- Mediterranean Allied Air Forces: Microfilmed Files and AIR 20 -- Air Ministry and Ministry of Defence: *Papers accumulated by the Air Historical Branch*. Also Reports on German factories at the end of the Second World War contained in WO 252. In FO 935 are the records of the Control Office, which succeeded the Economic and Industrial Planning Staff, administered by the War Office in 1945 and which in 1947 became the German Section of the Foreign Office. These accounts of the British post-war administration of Germany contain much information on German industry at the end of the Second World War. Menibum had originally been established in May 1936 as a subsidiary of HOBUM, which had been an agricultural machinery manufacturer. After the war all the machinery was stripped from the plant and handed over to the Soviets.



*In the closing stages of the war, the Allied advance into Germany resulted in *Nachtschlachtgruppe 1*, which operated on the Western Front, being split into two components. One part was designated *NSG 1 (Nord)* and was based in northern Germany and Denmark, while the other, *NSG 1 (Süd)* was based at Neubiberg. The machine shown here after capture in May 1945, was almost certainly operated by *NSG 1 (Nord)*.*



*This Ju 87 D night ground attack aircraft with a *Universalabwurfbehälter* mounted on the centreline bomb rack was photographed at Straubing in Germany in July 1945.*



These photographs show a still remarkably intact Ju 87 D-5 coded V8+TD of NSG 1 (Süd) at Neubiberg in the autumn of 1946. Both wing-mounted MG 151 cannons have been fitted with flash suppressors and the fairing on the radio mast would normally have carried a loop aerial for the FuG 16.



Junkers Ju 87 D-5 of NSG 1 (Nord), Neubiberg, 1945/46

Camouflaged in the standard 70/71/65 scheme, this aircraft is unusual in that the letter D in the operational markings was normally that of the III. Gruppe Stab of a Geschwader, whereas the machine belonged to a single, independent Gruppe. The W.Nr. 142103 was painted in white on the top of the tail fin, and the Hakenkreuz and uppersurface Balkenkreuz were in the white outline style.



A Ju 87 D-5, aircraft letter B, captured by Soviet forces in the winter of 1944/45. Although missing, the spinner would almost certainly have been decorated with a white spiral, as shown (bottom) on a similar Ju 87 D from the same unit, but with the individual aircraft letter L. Although lacking flame dampers over the exhausts, the flash suppressors on the barrels of the MG 151 cannon suggest these aircraft belonged to a *Nachtschlachtgruppe*.





various marks of the *Dora* (N). They were soon in almost continuous action on all fronts, and not just at dusk or night, but undertook frequent daytime sorties, against Partisans in the Balkans, against the Anzio bridgehead in northern Italy and even on the Western Front as the Allies pressed in on the shrinking Reich. The RAF historian conceded that:

*"The use of the Ju 87 for night harassing operations was of long standing on the Russian Front, and its effectiveness and comparative invulnerability to Allied defence had been well tried out in Italy. Its lack of speed was of advantage in avoiding attacks by night fighters, and losses at night to A.A. were inconsiderable. It could only be used with any hope of success during periods of moonlight, however, but during such periods it was used intensively. Double sorties were almost routine and in times of emergency three, four or five sorties were made by some crews."*⁴⁷

NSG 2, having flown the Arado 66, Go 145 and He 72 on the Eastern Front, was retrained on Antons at the Type A *Schule* at St. Raphael airfield, on the Côte d'Azur, in occupied Vichy France, and rejoined the conflict in White Russia and Poland, flying from Turbia with the Ju 87 *Dora* before moving base to Stubendorf, near Oppeln in Silesia.

The unit emblem of the 3./NSG 2 reflected ironically the feeling the aircrews had for their task, a Gnat holding a Lantern sitting astride a bomb with the numeral three on one fin, silhouetted against the moon. Gnat bites indeed, but they performed a useful and valuable service none the less.

During the ill-fated British Operation *Market Garden* between 17 and 26 September 1944, the *Nachtschlacht* Stukas of NSG 1 and NSG 2 were in action against the vital bridges captured by the paratroops, ironically the scene of the Ju 87's earlier victories at Maastricht, Nijmegen and Eupen in 1940. Similarly, the badly organised American moves into the Hürtgenwald and against Aachen, provoked nocturnal *Stuka* missions against various village strong points. During the brief, but bloody, German counter-offensive in the Ardennes in December 1944, known as the 'Battle of the Bulge', Ju 87s attacked targets close to Bastogne.

On the Italian front distinguished work was accomplished by NSG 9, with inspired leadership by Major Rupert Frost, a former bomber pilot who had become the *Kapitän* of the first NSG unit, the 1. *Behelfskampfstaffel* Luftwaffenkommando *Don*, was appointed as the *Gruppenkommandeur* of NSG 9 on 30th November 1943. With experience of night-bombing operations, Frost was able to build up the unit's strength at Casabianca airfield, with forward bases at Ravenna (1. *Staffel*: *Hauptmann* Karl-Heinz Kuhle) and Rimini (2. *Staffel*: initially led by *Oberleutnant* Rolf Martini, then by *Oberleutnant*

This Ju 87 D-5, W.Nr. 142091, was found abandoned at Milovice in Czechoslovakia in May 1945. It is still fitted with universal containers under the wings and was probably employed by NSG 4 to supply surrounded German forces. Note that, in addition to the flame dampers over the exhaust, the MG 151 cannon in the wing have been fitted with flash suppressors.

⁴⁷. *The Rise and Fall of the German Air Force*, op cit.



Above: This Ju 87 D-5 was found abandoned at Hradcany in Czechoslovakia in May 1945. The W.Nr. 1084 appeared on the fin, and the overpainting at the top of the rudder suggests it may previously have served with the Hungarian Air Force. However, before being abandoned, it had more recently flown with 2./NSGr. 4 and although the fuselage is in shadow, the operational code 1K was applied forward of the Balkenkreuz in the small, late war style, and the last letter was a K. Although the individual aircraft letter is not known, given that most units adopted an alpha-numeric sequence, the 3 on the cowling may indicate that it was C, making the full code possibly 1K+CK.

Bernd Schewen and finally by Major Robert Rohn), of nineteen and eighteen aircraft each. They were equipped mainly with the Ju 87 D-7 conversion from the standard D-1 and the D-8 conversion from the D-3, (both types fitted with D-5 wings) although it was their obvious wing configuration that seemed to dictate how they were classified by the units themselves.

By August 1944 both a *Stab* unit, under Frost, and a 3. *Staffel* (formerly 2./NSG 2 from the Eastern Front) under *Hauptmann* Eduard Reither had been added to the *Gruppe* to give a strength of thirty-four converted *Stukas*. They featured during the Allied advance on the German Gothic Line and by the end of the year were based at Villafranca di Verona and Bovolone, attacking targets at Faenza and Forlì. Missions varied widely but included attacks against troop concentrations,

bridges, railway stations, and forward airstrips. The AB 500 container carried the favoured ordnance of fragmentation or incendiary bombs which was delivered at heights that varied from 1,000 to 2,000 metres, with supplementary strafing carried out down to 20 metres. Propaganda leaflets were also carried on numerous occasions.

By March the *Stukas* were being replaced gradually by Fw 190 F-8s, but some *Doras* remained operational to the end, based finally at Ghedi and Thiene. One of the last recorded Ju 87 conversion combat missions was conducted on the night of 23 April 1945, against the San Benedetto bridge on the River Po, the aircraft being E8+EL piloted by Fw Hans Deutsch. The remaining flyable *Stukas* of NSG 9, fourteen aircraft in all – left Thiene and flew to Innsbrück at the end of the war, one aircraft crash-landing on arrival, while eight damaged machines were captured by the advancing Allied armies at various bases⁴⁸.

NSG 9 was formed in late 1943 and sent to Italy to operate Fiat CR.42 biplanes at night against the Allied landings at Anzio in Italy in January 1944. The unit was subsequently re-equipped with a mixture of Ju 87 D-3 and D-5 aircraft, this example being a D-3, W.Nr. 2600. The full code was E8+GK, and the normal 70/71/65 scheme was modified with the addition of a dense tan *Wellenmuster* overspray on the upper surfaces and wide, grey, chord-wise stripes on the undersides.



⁴⁸. An excellent and detailed account of this unit is - Nick Beale, *Ghost Bombers: The Moonlight War of NSG 9: Luftwaffe Night Attack Operations from Anzio to the Alps*, Classic Publications, Crowborough, 2001.



The flame dampers on this similarly camouflaged Ju 87 D-5 of NSG 9 have been extended to lead back over the wing leading edge, and flash suppressors have been added to the barrels of the MG 151 cannon.



Ground crew replacing the cowlings on a Ju 87 D of NSG 9 in Italy.



Junkers Ju 87 D-5, 1./NSG 9, Tuscania, April 1944

Feldwebel Günther Gräßer's aircraft shown on 20 April 1944, a week before it deployed to Tuscania, it was one of the first NSG 9 *Stukas* into action. It had the signature camouflaged of the *Gruppe*, a brown meander pattern over the basic two-tone green splinter while the pale blue undersides were darkened by grey "tiger stripes." The tip of the spinner was white and there was a small white "S" on the front of the wheel spat.



The remains of a night ground attack Ju 87 D-3 at Prague - Rusin in 1945. Note that most of the canopy framing on all variants of the Ju 87 was under the Plexiglas.

NSG 1 was transferred to the Western Front in February 1945, but because of the shrinking parameters of the Reich, the unit was split in half with the southern section still commanded by *Hauptmann* Hilberger in the southern zone working out of Mühldorf-am-Ihn to the east of Munich, while *Oberleutnant* Müller-Broders led the NSG 1 Nord component out of Kirchhellen and later Wunstorf, west of Hannover. The two units were identified from each other by the white (north) or yellow (south) band around the forward nose of the *Stuka*, just abaft the engine. While their targets continued to mainly be soft-skinned vehicles, artillery positions and troop concentrations, in the final

days, some daylight missions were flown against Allied armour. The subsequent loss of forward airfields in the Ruhr however led to the withdrawal of the one hundred night-attack *Stukas* to bases north of Frankfurt and west of Kassel.

Perhaps the most well known of their missions was the daylight attack made against the Remagen railway bridge, left intact over the Rhine, and used as a gateway by the Americans into the Reich. On 8 March 1945, in an attempt to breach this vital link, a last-ditch sortie was mounted by NSG 1 Nord, which even *Oberst* Hilberg labelled as a suicide mission. The six *Stukas* with a pair from each of the 1., 2. and 3. *Staffeln*, were equipped with SC 500 and SD 1000 bombs with what were termed "enhanced explosives", fused to be dropped from a height of 150 metres. The bridge was heavily protected by radar-directed anti-aircraft guns and were soon in action. One American account recalled:

"Thirty minutes later, a string of eight Stukas began their passes, one by one, over the bridge. These isolated attacks would last for 45 minutes. The American antiaircraft artillerymen were amazed to see the old dive-bombers. Many of them had been in combat for over nine months against the Germans, but none had seen a Stuka, except in pictures. The Ju 87 was the perfect aircraft to attack the bridge at Remagen. It could approach the defences at high altitude and dive on the bridge. This almost perpendicular dive-bombing tactic, or the more shallow approach used to support the infantry, promised the hope of a hit on the bridge.

*"The eight Stukas approached from the south along the river at 3,000 feet. MacGrain's radars easily acquired them at that altitude, and his 90 mm fired away. Despite the AAA fire, the bombers took no evasive action. Some jettisoned their bombs before reaching the bridge, and one bomb did fall on the western approach to the bridge. That would be as close as the Luftwaffe would come to the bridge. Colonel MacGrain's battalion killed all eight aircraft, mostly with machine gun fire. Battery B of the 413th, the unit farthest to the south, was credited with four kills."*⁴⁹

The truth was somewhat different, but only slightly less deadly for the attackers. The flak gunners actually only destroyed five *Stukas* outright, (the machines of Berg, Debel, Hölzel, Päch and Zbyrowsky), but a sixth was so damaged that it crash-landed close to Grevenbroich. Unfortunately these sacrifices were in vain as the special fuses failed and the bridge was left intact.

The end was clearly in sight. The *Nachtschlachtgruppen* flew thirty sorties per night against the advancing British 21st Army Group offensive in the last week of March, attacking targets of opportunity in the Oppenheimer region.

⁴⁹. 49 AAA Bde, *Enemy Aircraft Destroyed or Damaged*, no date (early March 1945), NFRB 407-427-17523.

In fact, despite impossible odds from both East and West, the NSG 1 Nord fought right to the end, finally being surrendered, to the British army at Husum to the west of Schleswig on the Danish border.

Stuka-equipped *Nachtschlachtgruppen*

Unit	Code	Commander	Area	Period
NSG 1	V8	Major Wolf Zechiel	East	May 1943-Sept. 1944
		Hauptmann Hilberger	East	Sept. 1944-April 1945
NSG 1 Nord		Oberleutnant Muller-Broders	West	February-May 1945
NSG 1 Sud		Hauptmann Hilberger	West	February-May 1945
NSGr 2	D3	Hauptmann Muller	East	Oct.1943-Nov. 1944
		Major Rohn	West	Nov. 1944-March 1945
		Hauptmann Gustav Weber	West	March-April 1945
		Hauptmann Denker	West	April-May 1945
NSG 4	1K	Major Gamringer	East	July-October 1943
NSG 6			Italy	Sept.-December 1944
NSG 7	4X		Balkans	July 1944-March 1944
NSG 8	6J	Hauptmann Trinka	Arctic	May-August 1944
NSG 9	E8 & D3	Oberst Rupert Frost	Italy	Nov. 1944-May 1945
NSG 10	5B		Balkans, Hungary	Sept.-February 1945
<i>Gefechtsverband</i>				
Hallensleben	D3	Oberst Rudolf Hallensleben	Ostheim	Sept. from 1 & 3./NSGr 2

Dora Proposals and Conversions

While the long-winged *Dora* 5 had become the preferred 'standard' dive-bomber, and was produced in large numbers to replace the D-1 and D-3 in combat, there were many variations and types, both proposed and converted, to the standard model. Thus a D-5, which was fitted with flame dampers and other equipment for nocturnal operations was designated a *Dora* 5N. Conversely, the rigours of wartime material shortages dictated a study for a bare, stripped-down variant in 1943. This 'rationalisation' saw installation of simplified fittings in an attempt to speed production and reduce costs, but apart from a few trial aircraft, it was not taken any further because it was estimated that the cost of introducing the changes to the production line actually *exceeded* any instrumentation cost-savings that would be attained. The plans were therefore terminated in 1944.

The advantages of the 0.6 metre extension (from 13.81 metres to 14.98 metres) to the wingspan in the D-5 to wing-loading potential for the new *Schlacht* role of the *Stuka*, were limited. The ground-attack capability of the 20 mm MG 151/20 cannon had paid handsome dividends in battle and so it was decided to retrofit existing D-1 and D-3 *Stukas* that were still in good order, to take advantage of this, and these were designated as the D-7 and D-8 respectively.⁵⁰ These aircraft were almost identical in most respects, being powered by the Jumo 211 J driving the VS 11 propeller. Armament comprised the MG 81 Z (*Zwilling*= twin) machine guns with 1,400 rounds of ammunition and the MG 151 with 500 rounds. With either a 250 kg or 500 kg bomb carried beneath the fuselage and either a single 250 kg or two 70kg bombs on carriers under the wings. Combinations of bomb loadings resulted in weight loading variations as follows:

Junkers Ju 87D-7 and Ju 87D-8 - Bomb loads and fully laden weights

Type	D-7	D-8	D-7	D-8	D-7	D-8	D-7	D-8	D-7	D-8	D-7	D-8
Bombload Option	1	2	3	4	5	6						
Armament Classification	M1	M1,	M2	M1	M1,	M2	M1,	M2	M1,	B		
Bombs - Number and Size	1 x 250	1 x 250	4 x 70	1 x 500	1 x 500	4 x 70	1 x 250	2 x 250	1 x 250			
Total all-up weight (kg)	5113	5223	5473	5583	5363	5473	5723	5833	5693	5803	5656	5766

The retrofitting of both these types with both flame-dampers added 20 kg to the total all-up weight, and the installation of blind-flying equipment and trailing antenna, (*Schleppkupplung*), another 7 kg.

⁵⁰ Some (self-appointed and self-proclaimed) 'experts' claims these aircraft did not exist. However the Junkers Flugzeug-und Motoren-Werke AG apparently thought they did for they took the time during war to produce the *Werkschrift* 2087 on 5 February 1944, as a Summary of the Manuals of the Preceding Issues of the Ju 87, from which these figures are taken.

Oblt Kurt Schwirblatt, under the wing of the Ju 87 D-5 T6+TU. Clearly visible on the underside of the wing is the yellow tactical marking which was applied to many Luftwaffe aircraft operating with Luftflotte 4 in Hungary between September 1944 and March 1945.



Officially, the identity of this Ju 87 D-5 of 10.(Pz)/SG 2 was T6+TU, but the aircraft carried only the last two letters. Note the glider-towing attachment and the stripe on the rudder. This aircraft was probably flown to Kitzingen by Major Kurt Lau.



Junkers Ju 87 D-5 of 10./SG 2, May 1945

This aircraft was finished in a 70/71/65 scheme and had a yellow V under the port wing. The yellow band around the rear fuselage had evidently been overpainted, probably with RLM 02, and the marks on the base of the rudder and on the rear fuselage are thought to have been mud, splashed onto the aircraft when it was stationary. Note the slightly darker spinner tip, probably where an earlier spiral design had been overpainted.

Stuka Training Units

The training of aircrew that were selected and found suitable for the special skill of dive-bombing required a careful process of elimination. Pre-war, the dive-bomber arm quickly acquired a certain kudos, similar to that of the fighter units – an elite arm to which only the best aspired – and this feeling was amplified and reinforced by the stunning victories achieved with the Ju 87. There never proved a shortage of volunteers. The particular aptitudes required and stresses involved in the dive-bombing procedures meant that a very high standard of fitness was required, with only about one third of the candidates actually qualifying for combat duties. Even such outstanding a *Stuka* pilot as Hans-Ulrich Rudel, describes his frustration at being kept kicking his heels in his tent in Greece while the Battle of Crete was being decided by the *Stuka* because his immediate superior and *Staffelkapitän*, *Leutnant* Ernst-Siegfried Steen, (himself a volunteer from the ranks of the infantry six years earlier) did not think he was yet ready for combat operations!

The original dive-bomber training unit had been established at Döberitz with JG 132 in 1934, utilising the Heinkel He 50. This was an additional skill course tacked on the unit's existing fighter training programme, but the expansion of the arm soon called for a more dedicated infrastructure to be set up. For the initial introduction to *Stuka* tactics, induction schools were established at Aibling and Mühldorf, and soon there were *Stukaschulen* at Schweinfurt, Wertheim and Insterburg, East Prussia.

Pilot training was carried out by *Stukaschule* 1, based at Kitzingen and Wertheim and *Stukaschule* 2 at Thalerhof airfield near Graz, Austria, and later at Foggia in Italy. After the fall of France, *Stuka* training units were organised at Cuers and St. Raphael (St.G 101), again at Graz (St.G 102) and Frescaty airfield near Metz (St.G 103).

The rear-seat radio operators (*Bordfuncker*) had their own specialist schools. The competent handling of the relatively simple equipment fitted to the Ju 87, mainly the FuG VIIa cockpit radio, and the MG 15 machine-gun, was capable of being taught in a year-long course, and involved both basic wireless-telegraphy skills, signals and navigation. In the case of St.G 77 for example, this was done at Halle/Saale airbase, with the tri-motor Ju 52/3m transport aircraft fitted out as a flying classroom. This was followed by actual *Stuka* experience in which *Kette* and *Staffel* exercises were alternated with targeting and experience of diving and bomb delivery, all conducted from Celle, while high-altitude flying and yet more dive-bombing work was conducted from Lippenstadt.

It was the critical fuel supply situation that brought about the most drastic changes to the schedule and scale of Ju 87 training as the war continued into 1943. *Stukaschule* 1 was reorganised as St.G 101 on 8 December 1942 to take account of the worsening situation in the East and the need for replacement aircrew once it had been decided that the Ju 87 was to continue rather than be discontinued from front line service. The IV. (or Supplementary) *Gruppe* of each *Stukageschwader* was reorganised as a component *Gruppe* of St.G 151, being based at Agram, thus:

IV./St.G 1 became I./St.G 151

IV./St.G 2 *Immelmann* became II./St G 151

IV./St.G 3 became III./St.G 151

IV./St.G 77 became IV./St.G 151

IV./St.G 5 became V./St.G 151

The whole *Luftwaffe* training programme was placed under the command of the then *Generalmajor* Werner Kreipe in June 1943 and, he vigorously and successfully re-organised the *Schulen* to increase output of qualified pilots. The number of trained ground-attack crews rose from 537 in 1942, to more than double that number, 1,264 in 1943. This was achieved despite and overall fall of twenty per cent in total personnel, a growing fuel shortage, and the need to take experienced *Stuka* instructors away from training and place them back in the front line. On 27 December 1943, the *Geschwader* was reorganised as a *Stab* and three *Gruppen* – I., II., and III./St.G 151. Subsequently, on 7 August 1944, SG 152 was merged into SG 151, to give four full *Gruppen*, with bases at Centocelli and Villafranca. At the same time the *Stab*, I., II. and III./SG 102, and III./ SG 103 working from Metz, and I., and II./SG 103, initially flying from bases at Biblis (near Worms), Thionville, Deutsch-Brod (near Prague), and later, as the boundaries of the Third Reich remorselessly shrank, withdrew to Fassberg and Horsching.

The St.G 101, in turn became *Schlachtgeschwader* 101 [SG 101] with the general re-organisation that took place on 18 October 1943. By this time the training *Geschwader* had establishments at Biblis, Clermont-Ferrand, Metz and Orly, with a Fw 190 *Jabo* conversion course set up at Fassberg in September 1944. The I./St.G 101 which carried out initial pilot training only with the Arado Ar 96, was

Geschwader Immelmann

Some Luftwaffe units were given honour titles after the names of famous First World War personalities, locations of battles or, some cases, persons considered martyrs to the National Socialist cause. The name of the First World War flying ace Max Immelmann was awarded to a number of pre-Second World War Stukagruppen which were eventually brought together as Stukageschwader 2 'Immelmann'. All personnel serving with the 'Immelmann' Geschwader, the only dive-bomber or ground-attack unit to be so honoured, wore an embroidered cuff title on the left sleeve of their uniforms. This was in dark blue cloth embroidered with silver-aluminium thread for officers or, as shown here, in matt grey cotton for NCOs and other ranks. (Martin Pegg collection)



On 17 November 1944, Obstlt. Rudel of Stab/SG 2 was flying the aircraft in the foreground of this photograph, a Ju 87 G-2, W.Nr. 494193, when he was shot down by machine gun fire from a Soviet tank and made an emergency landing on the fighter airfield at Budapest-Budaörs in Hungary. Although wounded twice in the left leg by 13 mm machine gun rounds, he continued to fly and on 23 December, celebrated his 2,400th war flight and the destruction of 463 tanks. The machine in the background, is T6+BU of 10.(Pz)/SG 2. This Staffel was led by Lt. Anton Korol, another Expert with the Ju 87 G-2, who was awarded the Ritterkreuz on 12 March 1945 and by the war's end had destroyed 99 tanks and put another 200 out of action.



Junkers Ju 87 G-2 of Stab/SG 2, Seregélyes, Central Hungary, December 1944

As Kommodore of the famous 'Immelmann' Geschwader, Oberstleutnant, and later Oberst, Hans Rudel flew a number of similar Ju 87 Gs, each carrying a chevron and double bar markings. This machine was W.Nr. 494193, which was painted in white on both sides of the fin, but with the first 9 on the port side placed slightly lower than the remaining numerals. The spinner had a black and white spiral, and although the Stammkennzeichen of this aircraft was SO+FW, it is not known if this appeared under the wings. Note there was, however, a special recognition marking in the form of a yellow V under the port wing.



based at Wrist, with the II./St.G 101 and III./St.G 101 at Brünn and Hörsching, near Linz. However, the shortage of fuel saw the total disbandment of the St.G 101 as early as 27 December 1944.

With the introduction of the *Nachtschlachtgruppen*, *Blindflugschule II*, the instrument training school, was incorporated into *Schlachtfliegergeschwader 111* (SG 111) and blind-flying techniques were imparted.

With regard to aircraft, in the case of the Ju 87, the periodic design changes from the *Anton*, through the *Bertha* and the *Richard* to the *Dora*, had always meant a steady stream of replaced dive-bombers deemed obsolete for front line service, were thereby available for use in the training mode. Thus the early demise of the *Anton* from front line service while still relatively fresh, meant that it could be handed over to the *Stukaschulen*, who were still flying them as late as the summer of 1944. Many were captured damaged, but generally intact, by the advancing Allies in April and May 1945. Individual *Antons* also saw service in specialist units, as with the 5. Air Signals School [*Luftnachtschule*] at Erfurt, the *Luftwaffe* Medical School for research into diving stresses on personnel, and the 6. Technical School [*Fachschule*]. There was even a call, from *General der Flieger* Maximilian von Pohl on the Italian front, for Egon-equipped *Stukas* from NSG 4 especially fitted with the *Erstling* IFF and carrying a 500 kg bomb to be used as a target marker, or Pathfinder aircraft, but this idea was never taken up.

In their turn, as the *Bertha* and *Richard* began to be replaced in 1943, so too they were transferred to the training role with St.G 101 and then, finally, the training units of St.G 102 and St.G 103, later SG 101 and SG 103 of the *SGIof*, which still had *Berthas* and *Richards* on their strength as late as May 1944. Progressively, these Ju 87s were in turn scrapped and replaced by the increasing numbers of *Doras* being retired, so the continuity was maintained to the end. The introduction of the Fw 190 F *Jabo* however, meant that *Stukas* were not required in anything like the numbers previously thought necessary, although many D-1s and D-3s were scheduled for conversion into D-7s and D-8s for the *Nachtschlachtgruppen*.

The Heinrich

Conversely, the general use of former operational dive-bombers to train new aircrew was restricted by the fact that none of these aircraft was fitted with dual-controls. This was remedied by the conversion of *Doras* to accommodate them. The basic dual-control installation was copied from that already in day-to-day use in the basic training aircraft, the Arado Ar 96, which simplified the conversion. The *Bordfunker's* equipment, including the defensive rear-firing weapon, was stripped out and replaced by the second set of controls, but later versions retained the forward-firing MG 151/20 mm wing-mounted weapons to enable training in rudimentary ground-strafting.

Other modifications included adding glazed protrusions both port and starboard to the cockpit canopy to improve forward vision. Modified *Stuka* trainers were restricted to a single 500 kg practise bomb or eight 50 kg practise bombs, while gross weight was given as 5,810 kg. These *Dora* conversions became the Ju 87 H (*Heinrich*) of which several sub-types were planned according to the original *Stuka* type utilised, although they appear to have retained their original series designations in the same way as the D-7 and D-8 conversions had done.

Thus the *Dora*-1, D-3, D-5, D-7 and D-8 became the *Heinrich*-1, H-3, H-5, H-7 and H-8 respectively, *Heinrich*-1s serving with SG 103 and SG 111 as late as 1944.

After Italy arranged an armistice with the Allies, and which took effect on 8 September 1943, some members of the former Regia Aeronautica remained loyal to Mussolini and elected to fly with the Germans with the Aeronautica Nazionale Repubblicana, or ANR. However, a far larger number of Italian personnel elected to fly with the Allies, and the Italian Co-Belligerent Air Force was formed. To avoid operating against their own countrymen, operations by the Co-Belligerent Air Force were confined to Yugoslavia and Albania, some of which were limited tactical ground support operations flown by Ju 87 Ds. The aircraft shown in these two photographs was a D-3, W.Nr. 7579, and shows clearly where the earlier fascist insignia have been overpainted and replaced with green, white and red roundels. 87-667: Another Ju 87 D-3 of the Italian Co-Belligerent Air Force taking off from an American occupied airfield in Italy.

The Bitter End – the battle at the Seelow Heights

By the first month of 1945 the enemy was indeed 'at the gates' – those of Berlin itself. On the 12th the Soviet winter offensive got underway and rolled forward relentlessly over East Prussia, across the Vistula and, by-passing Posen, reached the River Oder in front of the German capital and at Breslau and Oppeln in the south, twelve days later. Some sixty *Stuka* and Fw 190 *Jabo* were transferred north from Hungary to *Luftflotte 4*'s Berlin area airfields, to help meet this threat. Stalin, impatient to reach the German capital before his Western allies, ordered his troops under the leadership of Marshal Ivan Koniev, who had commanded the Ukrainian front in the drive on Germany, to storm forward, regardless of loss. The only remaining geographical defence barrier left to the German defenders to impede Koniev, was an area of natural strength against assault from the east, some 56 km from Berlin, known as the Seelow Heights. Here the German 3. *Panzer Armee* under *General* Hasso von Manteuffel, made a last stand. On 16 April the Soviets commenced an all-out assault on this line. This was repulsed with heavy loss, but repeated the following day, and the next.

As well as the troops spread thinly on the ground, the defenders could call on the *Stukas* of SG 2 *Immelmann*, under the acting command of *Oberstleutnant* Kurt Kuhlmeier, based at Kummer, to aid them, and as so often before, they were not disappointed. Although the bulk of the German aircraft were now Fw 190s, photographs show that even in these final battles, a few *Stukas* were still flying combat missions. For the loss of seven aircraft, III./SG 2, led by *Hauptmann* Dr. Hans Müller, accounted for no fewer than 149 of the 368 T-34s destroyed and a fair proportion of the 30,000 enemy infantry killed in that final battle. Another old *Stuka* fighter present at the last battle was *Hauptmann* Artur Pipan who had flown his very first mission in February 1941 with 5./St.G 1 against Malta, and had subsequently fought in the desert campaign, in Greece, at Crete and then in Russia. He had been appointed *Staffelkapitän* in April 1943, and became the *Geschwaderadjutant* of SG 1. Pipan, now a *Ritterkreuzträger* after fighting in the long retreat from Warsaw, Posen, Danzig and Pomerania, became acting commander of I./SG 1 in March 1945. Such men were invaluable but were but a handful trying to stem the tide. Despite their best efforts, and outnumbered forty-to-one, the German line finally gave way on the 12th, and the Soviet steamroller moved west into the suburbs of Berlin to begin the final assault. Pipan finally surrendered his unit on 8 May at Schleswig Holstein, by which time he had 758 combat missions to his credit. Like Pipan, Rudel and a host of others, the *Stuka* had fought to the very end.

Oberst Rudel's cannon machine, a Ju 87 G-2, W.Nr. 494110, shortly after it had been deliberately ground looped at Kitzingen on 8 May 1945. By the time this photograph was taken, Rudel had already been driven away to an office in one of the airfield's hangars, and the Luftwaffe officer standing on the wing is Hptm. Ernst-August Niermann. This officer, another war correspondent who flew as Rudel's Bordschütze, had remained with the machine to collect Rudel's belongings. Six officers, six NCOs and one civilian female arrived at Kitzingen in three Ju 87s and four Fw 190s.



Another of the Ju 87s which arrived at Kitzingen was T6+VU, although only the last two letters were carried on the fuselage. This aircraft was deliberately damaged by the pilot, Oblt. Hans Schwirblatt, shown on the far left.



Summary

From 1 September 1939 to 30 September 1943, 1,269 *Stuka* aircrew were listed as lost in action, a mere handful in comparison to, for one example, the 50,000 men of RAF Bomber Command killed in action over Europe in this war, or the 60,000 British soldiers who became casualties in just one day on the Somme in an earlier conflict. Each casualty was a tragedy of course, but the dive-bomber proved a very economical weapon of war with a punch way, way above its weight because it was accurately delivered rather than randomly dispensed. There were never more than 360 *Stukas* in total over all war fronts at any one time, and yet their achievements were prodigious. No other bomber of the Second World War, which flew from the first day to the very last, achieved so much, so accurately and so economically. That is the *true* measure of the Junkers Ju 87.

Appendix One: *Stuka* unit codes.

All operation *Stukas* carried identification codes on either side of the national marking (the *Balkenkreuz* +). These took the form, reading left to right when viewing the + as follows.

Unit Code: A Letter and a figure. Black. The main Staff Unit Code, denoting the *Geschwader*, or *Gruppe*. (*Nachtschlacht* units had much smaller lettering). The Black *Balkenkreuz* outlined in white.

Individual *Stab* or *Staffeln* aircraft codes. A single letter in alphabetical order. Varying colours- i.e. white for 1. *Staffel*, red for 2. *Staffel* and yellow for 3. *Staffel* of each *Gruppe*.

Individual *Stab* or *Staffel* codes. Single black letter on the banded area, again alphabetical thus:

A = *Geschwader Stab* and *Stab Staffel*

B = *Stab I. Gruppe*

C = *Stab II. Gruppe*

D = *Stab III. Gruppe*

F = *Stab IV. Gruppe*

G = *Stab V. Gruppe*

H = 1 *Staffel*

K = 2 *Staffel*

L = 3 *Staffel*

M = 4 *Staffel*, etc.

Training aircraft had large white numerals painted on their rudders, as distinct from the much smaller *Werknummern* which were carried at the top edge of the rudders.

Stuka codes included: -

I. /St.G 1 = A5

I., II., III./St.G *Immelmann* 2 = T6

St.G 3 = H7, S1 & S7 (with 2F as *Stab*)

St.G 5 = J9 (retained as II. /St.G 1)

III./St.G 51 = 6G (retained by II. /St.G 1 on 6 July 1940)

I./St.G 76 = F1 but using Letter Codes C, M, N and P of II. *Gruppe* as I. *Gruppe*

codes had been allocated to the I. /KG 76 and from 6 July 1940 to III./St.G 77.

I., II./St.G 77 = F2, S2 & S7

II.(*Sturzkampf*)/LG 1 = L1

NSGr 2 = D3

NSGr. 9 = E8

Stukaschule 2 = SH

Appendix 2 – *Stuka* Wartime Commanding Officers.

Sturzkampfgeschwader 1

Geschwaderkommodoren

Oberstleutnant Eberhard Baier – 18 November 1939 to 21 June 1940

Oberstleutnant Walter Hagen – 22 June 1940 to 15 March 1943

Oberstleutnant Gustav Pressler – 1 April 1943 to 18 October 1943

I. *Gruppe Gruppenkommandeure*

Major Werner Rentsch – 1 May 1939 to 18 October 1939

Major Paul-Werner Hozzel – 18 October 1939 to December 1941

Hauptmann Bruno Dilley – December 1941 (Acting *Kommandeur*)

Hauptmann Helmut Sorge – December 1941 to 13 January 1942

Hauptmann Helmut Krebs – 17 June 1943 to 15 July 1943

Major Horst Kaubisch – 15 July 1943 to 18 October 1943

II. *Gruppe Gruppenkommandeure*

Hauptmann Anton Keil – 9 July 1940 to 29 August 1941

Major Johann Zemsky – 1 September 1941 to 12 January 1942

Hauptmann Robert-George von Malapert-Neufville – 13 January 1942 to 21 May 1942

Major Paul-Friedrich Darjes – 1 March 1942 to 29 May 1942

Hauptmann Robert-Georg von Malapert-Neufville – 29 May 1942 to August 1942

Major Alfred Druschel – August 1942 to 9 December 1942

Hauptmann Frank Neubert – 9 December 1942 to August 1943

Hauptmann Ernst Otto – August 1943 to 24 September 1943

Hauptmann Heinz Frank – 24th September 1943 to 18th October 1943

III. *Gruppe Gruppenkommandeure*

Hauptmann Helmut Mahlke - 9 July 1940 to 19 September 1941

Major Peter Grassman – 19 September 1941 to 1 April 1943

Major Friedrich Lang – 1 April 1943 to 18 October 1943

Sturzkampfgeschwader 2 'Immelmann'

Geschwaderkommodoren

Oberstleutnant Oskar Dinort – 15 October 1939 to 15 October 1941

Oberstleutnant Paul-Werner Hozzel – 16 October 1941 to 13 February 1943

Oberstleutnant Dr. Jur. Ernst Kupfer – 13 February 1943 to 9 September 1943

Oberstleutnant Hans-Karl Stepp – 10 September 1943 to 18 October 1943

I. *Gruppe Gruppenkommandeure*

Major Oskar Dinort – 1 May 1939 to 15 October 1939

Hauptmann Hubertus Hitschhold – 16 October 1939 to 15 October 1941

Hauptmann Bruno Dilley – 16 October 1941 to 3 January 1942

Hauptmann Otto Weiss – 4 January 1942 to 22 October 1942

Hauptmann Siebelt Reentz – 23 October 1942 to April 1943

Hauptmann Wilhelm Hobein – April 1943 to 24 September 1943

Hauptmann Alwin Boerst – 24 September 1943 to 18 October 1943

II. *Gruppe Gruppenkommandeure*

Hauptmann Ulrich Schmidt – 1 May 1939 to September 1939

Hauptmann Claus Hinkelbein – 10 September 1939 to 27 October 1939

Oberstleutnant Georg Fitze – 27 October 1939 to 16 December 1939

Oberstleutnant Walter Enneccerus – 16 December 1939 to February 1941

Hauptmann Leonhard Busselt – March 1941 to 4 December 1941

Major Ernst Kupfer – January 1942 to 13 February 1943

Hauptmann Martin Möbus – 13 February 1943 to 17 June 1943

Major Hans-Karl Stepp – 17 June 1943 to 10 September 1943

Hauptmann Maximilian Otte – 10 September 1943 to January 1944

III. *Gruppe Gruppenkommandeure*

Hauptmann Ernst Ott – 1 May 1939 to 16 April 1940

Major Clemens Graf von Schönborn – 16 April 1940 to 16 June 1940

Oberstleutnant Heinrich Brücker – 16 June 1941 to 1 August 1941

Hauptmann Ernst-Siegfried Steen – 1 August 1941 to 22 September 1941

Major Gustav Pressler – 1 October 1941 to May 1943
 Hauptmann Walter Krauss – 18 May 1943 to 17 July 1943
 Hauptmann Hans-Ulrich Rudel – 18 July 1943 to 18 October 1943

Sturzkampfgeschwader 3

Geschwaderkommodoren

Oberstleutnant Karl Angerstein – 10 January 1940 to 3 July 1940
 Oberstleutnant Georg Eder – 3 July 1940 to 1 April 1941
 Oberstleutnant Karl Christ – 1 April 1941 to 1 September 1941
 Oberstleutnant Walter Sigel – 1 September 1941 to 1 April 1943
 Oberstleutnant Kurt Kuhlmei – 1 April 1943 to 18 October 1943

I. Gruppe Gruppenkommandeure

Major Walter Sigel – 9 July 1940 to 1 March 1942
 Hauptmann Heinrich Eppen – 1 March 1942 to 4 June 1942
 Major Martin Mossdorf – 5 June 1942 to July 1942
 Major Herbert Spangenberg – July 1942 to 1 December 1942
 Hauptmann Horst Schiller – 1 December 1942 to 2 June 1943
 Hauptmann Helmut Naumann – 19 June 1943 to 18 October 1943

II. Gruppe Gruppenkommandeure

Hauptmann Kurt Kuhlmei – 13 January 1942 to July 1942
 Hauptmann Heinrich Heine – July 1942 to 1 April 1943
 Hauptmann Hans Neumann – 1 April 1943 to 13 August 1943
 Hauptmann Theodore Nordmann – 14 August 1943 to 18 October 1943

III. Gruppe Gruppenkommandeure

Hauptmann Kurt Walter – 13 January 1942 to 26 October 1942
 Major Bernhard Hamester – 27 October 1942 to 17 June 1943
 Hauptmann Eberhard Jacob – 17 June 1943 to 18 October 1943

Sturzkampfgeschwader 5

I Gruppe Gruppenkommandeure

Major Hans-Karl Stepp – January 1942 to July 1942
 Hauptmann Arnulf Blasig – July 1942 to November 1942
 Major Erwin Schulz – November to 21 November 1942
 Major Horst Kaubisch – 22 November 1942 to June 1943
 Major Martin Möbus – June 1943 to 18 October 1943

Sturzkampfgeschwader 51

Gruppenkommandeur

Hauptmann Anton Keil – 1 May 1939 to 9 July 1940

Sturzkampfgeschwader 76

Gruppenkommandeur

Hauptmann Walter Sigel – 1 May 1939 to 9 July 1940

Sturzkampfgeschwader 77

Geschwaderkommodoren

Generalmajor Günter Schwartzkopff – 1 June 1939 to 14 May 1940
 Major Clemens Graf von Schönborn-Wiesentheid – 15 May 1940 to 20 July 1942
 Major Alfons Orthofer – 25 July 1942 to 12 October 1942
 Major Walter Enneccerus – 13 October 1942 to 20 February 1943
 Major Helmut Brück – 20 February 1943 – 5 October 1943

I. Gruppe Gruppenkommandeure

Hauptmann Friedrich-Karl Freiherr von Dalwigk zur Lichtenfels – 1 May 1939 to 13 July 1940
 Hauptmann Meisel – 14 July 1940 to 19 August 1940
 Hauptmann Helmut Brück – 20 August 1940 to 19 February 1943
 Major Werner Roell – 20 February 1943 to 18 October 1943

II. Gruppe Gruppenkommandeure

Hauptmann Clemens Graf von Schönborn-Wiesentheid – 1 May 1939 to 14 May 1940
 Hauptmann Waldemar Plewig – 15 May 1940 to 30 July 1942
 Major Kurt Huhn – 1 July 1942 to 31 March 1943
 Hauptmann Helmut Leicht – 1 April 1943 to 18 October 1943

III. Gruppe Gruppenkommandeure

Hauptmann Helmut Bode – 9 July 1940 to 25 August 1942
 Hauptmann Georg Jakob – 26 August 1942 to 31 December 1942
 Hauptmann Franz Kieslich – 1 January 1943 to 18 October 1943.

Sturzkampfgeschwader 101

Geschwaderkommodore

Oberstleutnant Clemens Graf von Schönborn

Sturzkampfgeschwader 102

Geschwaderkommodoren

Oberstleutnant Karl Christ
 Major Bernhard Hamester

Sturzkampfgeschwader 151

Geschwaderkommodore

Oberstleutnant Karl Christ – 17 May 1943 to 18 October 1943

I. Gruppe Gruppenkommandeur

Hauptmann Karl Schrepfer – 18 September 1943 to 18 October 1943

II. Gruppe Gruppenkommandeure

Hauptmann Armin Thiede – 17 May 1943 to 1 July 1943
 Hauptmann Gerhard Küffner – 2 July 1943 to 18 October 1943

III. Gruppe Gruppenkommandeure

Hauptmann Siegfried Göbel – 17 May 1943 to 17 September 1943
 Hauptmann Heinrich Heins – 20 September 1943 to 18 October 1943

IV. Gruppe Gruppenkommandeur

Hauptmann Alexander Gläser – 17 May 1943 to 18 October 1943.



On 8 May 1945 a number of Ju 87 G-2s landed at Eschwege to surrender to US Forces. This example was taken into a hanger for examination. This machine had a plain dark green spinner and lacked a rudder stripe as seen on similar marked aircraft.