

PROFILE

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JUNKERS JU 87D





Probably taken during 1942 at the Weser Flugzeugbau factory airfield at Bremen-Lemwerder, this Ju 87 D-1 carries a 66-gallon drop-tank on the outer-wing port bomb-slip. (Photo: Messerschmitt-Bölkow-Blohm GmbH, Archiv ref. 87/42)

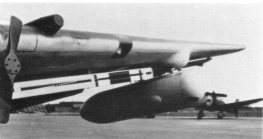
Junkers JU 87 D Variants by Richard P. Bateson

AS soon as the initial results of the Polish campaign in September 1939 were analysed, it became evident that the Junkers Ju 87 B (or *Bertha* as the variant was popularly called after the German wartime phonetic alphabet) was not entirely equal to the exacting tasks demanded of it under combat conditions.

At that historic moment in time, the *Bertha* equipped the *Stuka* (*Sturzkampfflugzeug*) dive-bomber arm of

Part wing of a Ju 87 D-1. From left to right: (a) propeller of the aerodynamically-driven siren, (b) hooded muzzle of 7-92-mm. Rheinmetall-Borsig MG 17 machine-gun, (c) landing-light fairing, (d) bomb-slip 100/500 to which is coupled a Waffenbehälter WB 81 A containing three Mauser MG 81 Z machine-guns also of 7-92-mm. calibre. The dive-brakes can be observed inboard of the WB 81 A in the extended position.

(Photo: Messerschmitt-Bölkow-Blohm GmbH Archiv, ref. 87/43)



the *Luftwaffe* and was capable of carrying a 1,100-lb. bomb to a target radius of 185 miles on a motor of 1,100 h.p. The *Bertha* would have to be refined, cleaned-up aerodynamically and re-engined so that heavier calibre warloads could be delivered capable of destroying concrete-covered gun emplacements, piercing underground command bunkers and penetrating thickly-metalled warship decks.

When Polish fighters had managed to break through to the strongly-escorted *Stukas*, a single flexible 7-92-mm. MG 15 machine-gun wielded by even the coolest radio-operator had proved of little value. Low-level strafing of unprotected cavalry was one thing but making passes against an enemy possessing rapid-firing light anti-aircraft weapons—and the Poles had a substantial number—was quite another. Such events had shown the *Bertha* to be seriously underarmoured and the crews much at risk. As a consequence, the *Generalluftzeugmeister* (Director-General of *Luftwaffe* Equipment) Ernst Udet, who had shown a personal interest in dive-bombing affairs from his own early flight-testing of the contending prototypes in the summer of 1936 until the outbreak of hostilities, concurred with the *Reichsluftfahrtministerium's* *technisches Amt* (German Air Ministry Technical Department) that an up-dated *Stuka* to be designated as the Ju 87 D (or *Dora*) should be ordered.

Although current production of the B- and R-series Ju 87s had been concentrated at the Berlin-Tempelhof airport plant of Weser Flugzeugbau GmbH, it was decided that the Junkers *Flugzeug und Motorenwerke* parent factory would hand-build the first few *Doras*. In the autumn of 1940, however, serious problems began to occur with the Jumo 211 F motors scheduled for use in the new aircraft. Thus, the first prototype of the D-1 series, the Ju 87 V 21, which had been due to fly during December 1940, stood engineless after completion in the experimental shop at Dessau. December came and went, and the V 21 (*Werk Nummer 0870536*) was joined by the V 22 (*W. Nr. 0540*) and the V 23 (*W. Nr. 0542*), all three *Versuchsflugzeuge* (experimental aircraft) now waiting for the Jumo 211 J powerplants that had in the meantime been designated as replacements for the luckless "F" model.

The Jumo 211 J-1 was a 12-cylinder liquid-cooled engine rated at 1,400 h.p., and apart from the improved cooling arrangement originally intended for the "F" (the induction oil cooler being re-positioned below the engine thus displacing the coolant radiator to a new location under the wing centre-section), featured a pressurized coolant system, a fully-hooded DVL-designed supercharger impeller, modified boost and injection pump control plus a strengthened crankshaft.

By February 1941, a small number of experimental Jumo 211 Js was being readied, and at last both the Ju 87 V 21 and V 22 were flown. Late engine delivery put back the first flight of the V 23 till April when it was to be joined by the V 24 (*W. Nr. 0544*). By May, the V 23 was about to start acceptance trials at the *Erprobungsstelle* (Testing and Experimental Station) Rechlin, and an increasing number of flight test hours was being accumulated. The last of the five engine-development prototypes, the V 25 (*W. Nr. 0538*), was soon to undergo tropical trials.

On June 6, 1941, a total of 1,037 D-1s was on order from Weser; all to be built at their Bremen-Lemwerder factory. The first two deliveries were scheduled for the following month, rising to a peak of 70 per month in



The Dora was first blooded during January 1942 when it was introduced on the Leningrad sector of the Eastern Front. Here, Ju 87 D-1s are bombed-up in the snow of a Russian winter. (Photo: via Egon Krüger)

January 1942 and with production planned to end in December of that year. Forty-two D-1s were to be delivered during the last month.

That the Ju 87 was an outdated design had already been realized and that the *Dora* was only a stop-gap before a completely new type incorporating the lessons of both the Spanish Civil War and the *Blitzkrieg*—lightning war—in the West (not to mention the humiliations of the Battle of Britain), could enter service. To this end, low-priority development of a heavily-armoured, retractable-undercarriage Ju 87 F (later designated 8-187), powered by a Jumo 213 A of 1,700 h.p., was being undertaken.

Towards the end of 1941, incidents occurred during development flying. In October, a *Dora* (coded BK+EN) suffered undercarriage failure on touch-down and one crew member was killed. The following month, a second Ju 87 D (BK+ES) had engine

"Fourteen tent-like heating structures were issued to each Gruppe in order that freezing and start-up problems could be minimized." Photographed in March, 1942, this Ju 87 shows the type of precautions needed to keep aircraft operating on forward airfields lacking heated hangar accommodation. The liquid-cooled Jumo 211 motor was singularly unfit for service in the Russian winter.

(Photo: via the author)





Captured at Martuba during November 1942, this Ju 87 D-1 trop was to serve as a back with No. 213 Squadron, R.A.F. Originally coded S7+LL of 3./St.G.3 it was later re-painted with British roundels and given the spurious letters "AK-7" (Photo: via Egon Krüger)



Riggers and fitters of an unidentified Royal Air Force Squadron find a wrecked Dora useful as a windbreak during November 1942. This was a period of heavy Ju 87 losses during the Axis retreat westwards following their defeat at the battle of El Alamein the previous month. (Photo: Imperial War Museum, ref. CM 3985)

trouble, crashed and, in overturning, killed one man and injured another. On January 5, 1942, three young n.c.o. pilots of *I. Gruppe, Stukageschwader 2 (I./St.G.2)* were killed when they flew their D-1s into the ground near Elbing in bad weather while a fourth *Dora* was badly damaged and the pilot injured. Not an auspicious prelude to the operational career of the variant. Nor did it add to the confidence of the aircrew of the *Stukageschwader* that had been given the task of proving the Ju 87 D-1 in combat.

In the third week of January, 1942, *I./St.G.2* equipped with D-1s was flying in support of the troops fighting desperately to hold-off a Soviet shock army attacking Staraya Russa and thus loosening the Axis grip on Leningrad. By mid-February, *7./St.G.1* (the seventh *Staffel* of *Stukageschwader 1*) was operating in the same sector of *Luftflotte 1's* (Air Fleet 1) Command where their D-1s were trying to prevent a massive Russian drive, following the onslaught that had ripped a hundred-mile gap in the German defences, with the prospect that they would encircle and destroy two corps of the *Wehrmacht* (German army) in the area. On February 12, *Hauptmann* (Captain) Bruno Dille, *Kommandeur* (C.O.) of *I./St.G.2*—a well-known *Stukaflieger* who

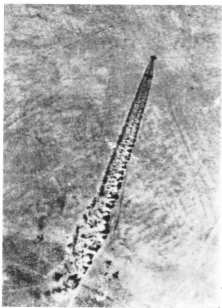
had led *3./St.G.1* against the Dirschau bridge on the first day of the war—was shot down by Russian anti-aircraft fire over Staraya Russa. Posted missing, he evaded capture and returned to his unit several days later. On June 4, he was awarded the *Ritterkreuz* (Knight's Cross) and he was to finish the war as an *Oberleutnant* (Lieutenant-Colonel) sporting an *Eichenlaub* (Oak Leaf) to his Knight's Cross.

On March 16, the *Staffelkapitän* (*Staffel* commander) of *7./St.G.2*, *Oberleutnant* (First Lieutenant) Immo Fritzsche was wounded by a *flak* burst though he managed to bring his aircraft back to base, and on the same day, *Oberleutnant* Friedrich Plätzer, *Staffelkapitän* of *2./St.G.2* crashed at Deworez and was killed. Both men were later awarded the *Ritterkreuz*. *I. Gruppe* of *Stukageschwader 77* was now re-equipping with the D-1, *3./St.G.77* being at Böblingen (south-west of Stuttgart) in Germany during the middle of the month.

From the spring of 1942 onwards, increasing numbers of Ju 87 D-1s were introduced into service in this, the northern sector of the Eastern Front. As with every new type, various problems became evident. These were reported, via teleprinter, to the *Eprobungsstelle* at Rechlin where remedial action was then considered. In addition, the *Stukageschwader Ergänzungstaffel* (Reserve Training *Staffel*) at Schweinfurt was issued temporarily with the *Dora*. Bombing results of the pupils on the ranges in the area were compared with those of others who flew examples of the earlier Ju 87 B and 'R' sub-types. It was found that, when diving from altitude with a heavy bomb load, the high speeds which built-up automatically caused unacceptably strong elevator forces, thus preventing accurate bombing. When dropping 2,200 lb. *Panzer-Cylindrisch* (armour-piercing) *PC 1000s* from a steep dive using the bomb-release slip *1000*, a large number of weapons failed to explode. This was traced to triggering of the arming device before igniter priming due to failure of fuses in both the *1000* bomb-release slip and the *PC 1000*. It was considered advisable to ban the use of *1000* slips and the fitting of a fuse plate to the bomb was advocated.

The at times almost nightmarish weather conditions experienced by the *Stukageschwader* in northern Russia placed a heavy strain on the Ju 87, and it is not surprising that many snags were encountered by both flying and ground personnel alike. The severe cold coupled with engine vibration caused many new Heine variable-pitch 3-blade propellers to split at both the blade and tip and these were later superseded by the Junkers VS 11 airscrew. Starter batteries gave constant trouble in the low temperatures. There was frequent failure of the injection system due to a build-up of ice in the tank when using aviation fuel. With the thermometer dropping to as low as -30°C ., burst oil coolers and frozen oil were major problems with all types of *Luftwaffe* aircraft in the severe Russian winter. Fourteen tent-like heating structures were issued to each *Gruppe* in order that freezing and start-up problems could be minimized.

The aircrew were little better off. Taxying on the poor forward airfields during the thaw meant that front movable radiator flaps had to be permanently fastened, whilst 600 aircraft under construction in



Fighter bait! Unusual illustration taken from an Allied photographic-reconnaissance aircraft of a Ju 87 D of St.G.3 towing off a DFS 230 troop-glider from a desert landing ground in Libya. It has always been believed that a special "D-2" variant of the Dora was used for this work, but the D-3 troop was definitely capable of towing the DFS 230, and in Rudek's book, Stuka Pilot, he mentions that in the Crimea his unit, "solved the transport problem by using our Ju 87s as tug aircraft for freight gliders" during the transfer from Graz to Sarabus, near Simferopol. (Photo: Imperial War Museum, ref. CM 4660)

Probably acquired in Tunisia during the spring of 1943, this Ju 87 D-3 troop named Jocelyn is unusual not only in having U.S.A.A.F. markings, but because all excessences including machine-guns, landing-light housings and dive-brakes have been stripped and the wing faired over. (Photo: U.S. Air Force, ref. 26623 AC)



May 1942 required modified radiator flaps as a result of this experience. Numerous pitot tubes were broken or damaged and retroactive reinforcement was introduced during overhaul. Once airborne, many taller pilots complained of the cramped leg room of the Dora and it was proposed that an increase be made in the length of the rear seat slide rails to overcome this. The rear-gunner behind his twin MG 81 Z (*Maschinengewehr 81 Zwilling*—twin-barrelled 81 machine-gun) found that his turret position left much to be desired, it being small and uncomfortable. In twisting evasive manoeuvres the ammunition boxes banged against the side windows, the clamping stirrup of the gun often came up from below with the danger of injury to the radio operator/air-gunner and the weapon frequently jammed, especially during a dive.

Repeated crashes because of main undercarriage collapse—mostly on uneven stony surfaces but also on grass runways—was a feature of the Ju 87 D. Investigation showed that whereas the sequence of B-2 undercarriage collapse was usually the failure of the wheel assembly followed by bending of the oleo leg, the D-1's upper wheel fork sheared first, leading to a collapse of the wheel assembly and thus implying that the D-1 undercarriage was weaker than that of its predecessor. The tailwheel of the D-1 also gave far more trouble than that of the B-2, especially when making sharp turns on poor airfields. To counteract this reduction in tailwheel strength, the tailwheel guides were removed resulting in an improvement in taxiing performance. Burst or punctured tyres in the D-1 often resulted in a buckled wheel, its sheet metal construction being inferior to that of the B-2. Early Doras, therefore, were fitted with B-2 undercarriages and main-wheels, limiting the normal maximum take-off weight to 11,133 lb. as opposed to the original D-1 design weight of 13,007 lb. This work was entrusted to the Espenlaub firm at Wuppertal. Incidentally, B-2 wheels were of 815 × 290-mm. diameter, whilst the production series D-1 to D-6 were planned to use strengthened 840 × 300-mm. ones.



Ancient and Modern. A Ju 87 D-3 troop of Stukageschwader 3 taxis on a North African airfield fringing an Arab town. A total of 1,559 D-3s were built between 1942 and 1944: 960 at Tempelhof and 599 at Bremen. (Photo: Bundesarchiv, ref. 416-1679-9)

During the introduction into service of the *Dora*, an event occurred that is still talked of when ex-*Stuka* personnel meet to reminisce. In Russia, during the period of heavy spring mud, a D-1 (there is some evidence that it was *W. Nr. 2110* of 7./*St.G.1*) was about to be air-tested. To assist in taxiing through the quagmire the ground crew-chief ordered two of his fitters to sit on both sides of the tailplane, thus preventing the Ju 87 from standing on its nose when increased throttle was applied. The aircraft proceeded to the take-off point, the pilot swinging the aircraft from side to side to avoid obstructions, the *Prüfmeister* (inspector) in the gunner's position engrossed in the instrument readings and his check-list. Getting the green lamp from the control van the *Oberfeldwebel* (Flight Sergeant) pilot gave the *Dora* maximum power and commenced the take-off run. One of the two ground crew on the tailplane was fortunately blown off, but the other *Gefreiter* (Lance Cpl.) clung on

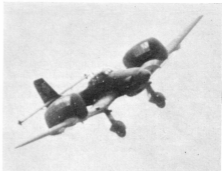
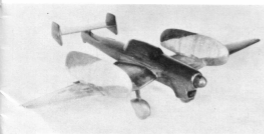
for dear life, his feet entwined in the tail bracing strut, not realizing that the *Stuka* was unsticking. The Ju 87 lumbered into the air and slowly climbed to about 1,500 feet where the unstable and pronounced tail-heavy characteristics of the *Dora* became so frightening that the crew decided to bale out. As he was unfastening his straps, the *Prüfmeister* in the rear cockpit looked up. From his rearward facing position, he was horrified to see the fitter still crouching huddled up against the slipstream on the port tailplane. He shrieked to his pilot not to jump. Commendably, the pilot made a slow and delicately-judged circuit of the airfield and executed a very good landing on the waterlogged field despite the "ballast" on the rear end. The ordeal had lasted about six minutes. After taxiing-in, the fantastically lucky corporal was temporarily

During 1942 the *Forschungsanstalt*—Research Institute—*Graf Zeppelin* at *Ruit*, near Stuttgart, commenced a programme designed to allow the rapid carriage of key personnel and urgent equipment in special pods fitted to standard operational aircraft. One of the first designs considered was the *Stuka*. This wind-tunnel model was an early layout, based on the pre-war Ju 87 prototype, and was tested in the 1.8 x 1.2-metre slow-speed tunnel at *Ruit*. The model was 1/20th scale.

(Photo: German Aviation Research Group of Air-Britain)

The FGZ's Ju 87 D-3 in flight. In order to improve the pilot's sideways vision, Plexiglass-covered windows were cut in the sides of each of the two-man pods. These containers were not jettisonable. Later this work was continued at the experimental airfield at *Aintree* by another agency, whilst FGZ concentrated on the development of various types of drop and slipper-tanks under the direction of Dr. Ulrich Hütter.

(Photo: German Aviation Research Group of Air-Britain)



blinded by the fierce air pressure, but soon recovered enough to become apparently more concerned that he might be charged for the loss of his service forage cap than that he had chalked up a quite incredible "first"—certainly in *Luftwaffe* annals.

March 1942 also found III./St.G.3 in Sicily. The *Gruppenstab* (*Gruppe* Staff flight), 7. and 8. *Staffeln* were at San Pancrazio, while 9. *Staffel* was detached to San Pietro, all formations converting to the D-1. On April 1, the *Gruppe* was launched against the battered island of Malta and made several attacks throughout that month. Losses to defending Royal Air Force fighters were high and the last raid by III./St.G.3 on the George Cross Island was May 10, when at least four D-1s and their crews were shot down. Towards the middle of May the *Gruppe* flew to North Africa; by May 20, the complete *Geschwader* was at Bir el Hania. The second *Gruppe* was also receiving the *Dora*, though the first *Gruppe* still operated a mixture of Ju 87 R-2 *trop* and R-4 *trop* aircraft. *Doras* ferried to the Mediterranean Theatre were standard examples but, on arrival, had to be modified by the attachment of sand filters to engine intakes and the installation of special desert survival packs; the suffix "D-1 *trop*" then being applied officially. It would appear that on occasion, newly arrived *Doras* were pressed into service without this modification, especially in the cool season or when the air situation was particularly critical.

During May 1942, *Lufflotte 1's* striking power was further enhanced by the delivery to *Stukageschwader 2* of the first production D-3s, both 4. and 9./St.G.2 receiving this variant. The D-3 retained the smoother engine cowling lines of the D-1, with the essential silhouette differences (from the earlier B- and R-variants) of re-designed cockpit canopy, smaller undercarriage fairings and enlarged vertical tail surfaces. But, whereas the D-1 was essentially a dive-bomber, the D-3 was to double as a low-level ground-attack aircraft, being extensively armoured around the motor with the air intake and oil cooler specially well protected. Additional crew armour was also provided. The aerodynamic sirens projecting forward from the main undercarriage legs were deleted and their housings faired over. Both D-1s and D-3s occupied the same production lines, the first 500 or so being predominantly D-1s, with a switch to a preponderance of D-3s after this figure had been delivered.

From May 26 to June 10, the small Free French fortress at Bir Hacheim—situated deep in the Libyan Desert—held out against a combined German and Italian force with many tanks and heavy artillery, plus continual attacks by *Luftwaffe Stukas*. This was the start of *Generaloberst* (Colonel-General) Erwin Rommel's summer offensive that was to break the defensive line running northwards from Bir Hacheim to Gazala on the Mediterranean coast, and which, eventually, was to push the Commonwealth forces back into Egypt. The heaviest losses in the air battles over Bir Hacheim were suffered by the first *Gruppe* of St.G.3. Early on the morning of May 29, Curtiss Kittyhawks of No. 450 Squadron, Royal Australian Air Force, chased the Ju 87 Ds of 4./St.G.3 over Gazala and shot down *Hauptmann* Drescher (their *Staffelkapitän*) who made a forced-landing. Taken prisoner, Drescher managed to escape from the prisoner-of-war



*One for the modeller. An unidentified crew pose on their Dora. The unit crest based on the city arms of Breslau (now a part of Poland) reveals the Ju 87 to be on charge to 3. *Staffel* of *Stukageschwader 2* "Immelmann." The legend on the radio mast reads, "Vorsicht 'Nicht anfassen'"—"Careful 'Don't touch'" (Photo: Bundesarchiv, ref. 393-1402-22A)*



*A pair of Doras from 3./St.G.2 sporting crests both associated with the *Staffel*. The rear aircraft bears the arms of Breslau, whilst the nearest machine shows a Scotty dog, this sign being carried on all aircraft of 1. *Gruppe* with different coloured backgrounds to indicate individual *Staffeln*. In this case, 3. *Staffel* has a yellow field with the black dog superimposed. The Ju 87 in the foreground is interesting in that it is a D-1 with sirens removed and the MG 17 muzzle-housing missing, the barrel of the gun protruding. (Photo: Bundesarchiv, ref. 393-1523-23A)*

"cage" and made his way back to Axis lines, rejoining his unit several days later. By May 31, 4. *Staffel*, much reduced by the attentions of the Desert Air Force, was refurbishing at San Pancrazio. III. *Gruppe* was at Berca. Another *Staffelkapitän* with 5./St.G.3, *Oberleutnant* Anton Ostler, was lost on June 16, possibly while attacking a convoy off Derna.

By June 1942, Ju 87 wastage was already running at some 150 aircraft per month. At that time, a minimum of 18 *Stuka-Gruppen*, totalling 720 dive-bombers, was considered to be the number needed to support the German offensives in the East and the Mediterranean. Reports reaching the *Oberkommando der Luftwaffe*—OKL (*Luftwaffe* High Command) showed the loss rate to be even higher and it was decided that produc-



An unarmed early production Ju 87 D-5, probably at Bremen-Lemwerder. The code letters KS+XD on the starboard fuselage are repeated in reverse order under the wings. Reading from left to right—"DX" under the port wing and "SK" under the starboard mainplane. This lettering was retained on operational aircraft, although the fuselage combination was sprayed over and a unit cipher took its place. (Photo: Messerschmitt-Boikow-Blohm Archiv, ref. 87/28)

tion should be stepped-up to account for a wastage of 165 Ju 87s a month. It had also been intended to re-engine later *Stukas* with the Jumo 213 as well as backing continued development of the Junkers 8-187 which was to be the German answer to the highly successful Ilyushin Il-2 "*Sturmovik*". But this Jumo 213 idea was dropped and a new project, the "light Stuka", considered. Although not much is known of this project, it was planned that the first prototype should be ready for flight trials by March 1944 and, if successful, the initial production aircraft would be completed by March 1945, with a run of 150 a month being reached by January 1946.

Following the successful capture of the Crimea in

May-June 1942, the *Wehrmacht*, supported by Hungarian, Italian and Rumanian troops, drove relentlessly towards Stalingrad (now Volgograd). As the Axis forces neared the city, so the Soviet resistance strengthened. During July, several of the *Luftwaffe's* best *Stuka* pilots were killed or maimed. On July 13, *Unteroffizier* (Corporal) Rainer Nossek (later to be awarded the *Ritterkreuz*) of 5./*St.G.2*, flying a D-3, was seen going down with his Ju 87 gushing white smoke after being attacked by a Red Air Fleet fighter over Forchstadt station. Posted missing, he managed to evade capture and returned to the German lines five days later. On July 19, *Hauptmann* Schairer, *Staffelkapitän* of 7./*St.G.1* crashed to his death in a

A completely standard Ju 87 D-5. The harness hanging under the forward fuselage was the securing strap of the bomb-crutch, designed to swing the weapon clear of the airscrew during a dive. (Photo: Bundesarchiv, ref. 581-2067-14)



D-1 after being hit by enemy fire near Tuleblya. On July 20, a Knight's Cross holder, *Leutnant* (Second Lieutenant) Alfons Schmalz, serving with *II./St.G.2*, was badly injured in a D-1 crash when his aircraft was raked by ground-fire near Tarinskaya. Five days later, *Oberleutnant* Martin Möbus (another *Ritterkreuz* holder and *Staffelkapitän* with *4./St.G.2*), was injured after combat with an enemy fighter. Finally, on July 27, *Oberleutnant* Ernst Fick, a fellow pilot in charge of *6./St.G.2* was shot down by *flak* near Beresov. Fick was awarded the Knight's Cross on September 19 that same year.

By September 1, no fewer than 4,032 Ju 87 Ds were on order, all but one of a revised contract for 592 D-1s having been completed. It was intended that the next version of the *Stuka*, by then in mass production, would total 1,349 with 597 D-3s to be built at Bremen-Lemwerder and 752 to be constructed at Berlin-Tempelhof. A decision had now been reached concerning the fabrication of further developments of the D-series. First, a total of 1,178 D-5s. These were to have an extended outer-wing section (of just under two feet on each tip designed to increase the overall wing area and lower the wing loading) and also to feature jettisonable main undercarriage legs plus wing-mounted MG 151/20 cannon. Secondly, 913 D-6s were to be constructed. Once more, production was to be split between the two Weser factories.

The first heavy air attack on Stalingrad was launched on September 3, 1942, coinciding with a big ground assault. In the thick of the air-fighting were elements of *Stukageschwader 1*, 2, 77 and *Schlacht* (Ground-Attack) *Geschwader 1*, the latter unit operating a variety of machines ranging from the venerable Henschel Hs 123 B (a biplane first blooded during the Spanish Civil War), to the Messerschmitt Bf 109 E-7. The twin-engined Henschel Hs 129 B was also used in a similar rôle. The whole city had been carefully covered by aerial reconnaissance. Enlargements of these photographs were used for briefing of dive-bomber crews because very accurate identification of targets was necessary to prevent strikes against friendly troops during the fierce and confused house-to-house fighting within the city. Also, pilots were not permitted to drop their loads unless a target had been positively identified and the position of friendly forces ascer-



With undercarriage wheel spats removed to assist taxiing in the snow, a Ju 87 D-3 is run up by the ground staff. Note the fitter sitting on the port tailplane. This cold and unpleasant task was necessary in order to prevent the Dora nosing over when manoeuvring on airfields with poor surfaces.
(Photo: Bundesarchiv, ref. 501-149-5A)



An immaculate Junkers 87 D-5 is rolled out of the Weser Flugzeugbau factory at Berlin's Tempelhof Airport. Over 600 D-3s were assembled at this plant before production was switched to ground-attack FW 190s.
(Photo: via Egon Krüger)

Another Ju 87 D-5 is towed away from the assembly hall by a Kettenfahrzeug—tracked vehicle—to await acceptance testing and delivery to a Luftpark. Once at this Air Park or Maintenance Unit, the Dora would be stored until required by a particular Staffel to replace an aircraft lost in combat or otherwise written off. Before being ferried to the unit, the Luftpark would ensure that all recent detail modifications were incorporated.
(Photo: via Egon Krüger)





Close-up of the B-Stand or rear-gunner's turret in the Ju 87 D-5. The coupled Mauer MG 81 machine-gun (MG 81 Z) were fitted in a Gleitschienenlafette GSK-K 81 Z flexible mounting giving a 70° traverse to port and starboard, up to 80° upwards and 10°-15° downwards. The long projection on the left of the twin 7.92-mm. gun barrels is the VE 42 gun-right (a development of the VE 22 used in the Ju 87 D-1) and to the right of the MG 81 Z is an instrument to measure deflection. The extensive armour protection for the gunner can be seen under the Plexiglass. (Photo: Bundesarchiv, ref. 446-1935-18)



All variants of the Dora suffered from frequent tyre failures, a punctured cover often resulting in a buckled wheel. As the war progressed, the Germans were forced to utilize low-grade materials in their aircraft production programmes. This particular incident shows the effect of overstressing a Ju 87 D-5 main wheel of sheet metal construction. (Photo: Bundesarchiv, ref. 501-133-27)

tained. Very close co-operation was achieved between the *Wehrmacht* (Army) and *Luftwaffe* at this time, *VIII Fliegerkorps* (spearhead of the aerial assault on Stalingrad, commanded at this time by *General-leutnant*—Lieutenant-General—Martin Fiebig) having an advanced headquarters within the German-held western portion of the city directly adjacent to an army observation post and plotting centre. From here, radio messages were flashed to patrolling *Stukas* giving the grid references of pockets of Soviet resistance. In this manner, the location of constantly shifting artillery batteries, sited east of the river Volga and firing into German-held Stalingrad, were speedily plotted and the guns silenced. By now the German

commitment to Stalingrad was total, and there developed the most bitter fighting yet experienced on the Eastern Front. The race against the Russian winter was on.

Casualties among the *Stukafieger* (*Stuka* pilots) in the East mounted progressively. On September 25, *Unteroffizier* Heinz Edhofer, a pilot in a formation of *Doras* from 5./*St.G.2*, was flying Ju 87 D-3 (W. Nr. 2466; coded T6+GN) near Lesmoja, some 40 km. n.n.w. of Stalingrad, when they were attacked by about 30 Soviet fighters including a number of MIG-3s. Although badly wounded in this encounter, he returned to operational flying and was awarded the *Ritterkreuz* in November 1944. *Hauptmann* Martin Möbus, already wounded by fighter attack in July, was hit and injured by *flak* again on October 10 while in a D-3. Two days later, the 32-year-old *Ritterkreuzträger* and *Kommodore* (Commander) of *Stukageschwader* 77, *Major* Alfons Orthofer, was surprised on the ground in a Ju 87 B during a Russian air attack against his base at Beloretschenskaya (on the Black Sea) and killed. The *Staffelkapitän* of 9./*St.G.1*, *Hauptmann* Heinz Fischer was lost on October 26; it is thought that he was caught in the trajectory of friendly artillery fire while flying a D-1 near Strelitz.

Now the spotlight switched to the Mediterranean. Here, the see-saw campaign had reached a stalemate after the *Afrika Korps* had been repulsed in its drive on Egypt at the battle of Alam el Halfa the previous month. At 21.40 hours on the night of October 6, 1942, Lieutenant-General Bernard Montgomery launched the famous battle of El Alamein. By November 3, the Germans and their Italian allies were in headlong flight back along the North African seaboard. Ju 87s took little part in the fighting until October 26, only 72 dive-bombers being available at the time the British struck.

On the evening of October 26, *Hauptmann* Kurt Walter, *Kommandeur* of III./*St.G.3*, was spotted leading a number of *Stukas* back to base at Haggag el Qasaba by No. 213 Squadron, RAF. His D-1 *troop* was attacked by a Hawker Hurricane and crippled. Walter and his radio-operator both baled out, but Walter's parachute failed to open and he was killed on impact. The following May, Walter's leadership was recognized by a posthumous award of the Knight's Cross. The morale of the *Geschwader* was at a low ebb, no better illustration being needed than the episode on October 28 when several Ju 87s jettisoned bombs on their own troops in their haste to avoid interception. By November 9, part of II. *Gruppe* had pulled right back to Tunis, but even here they could not escape the attentions of RAF bombers. III. *Gruppe* was in a worse position, leaving a trail of abandoned and damaged D-1 and D-3 *troops* at Gambut, Martuba, Arco Phileanorum and other airfields along the line of the Axis rout. Most heavily hit was II. *Gruppe* which, returning to the fray, found itself at Djedeida. On November 25, British tanks broke through the German defences onto the airfield where at least 11 D-3 *troops* were destroyed or badly damaged by AFVs. A number of *Doras* managed to get away under fire from the British guns, some making for Tunis, one or two even setting course for Trapani in Sicily with as many as four men crammed into this two-seat aircraft. During this period, II. *Gruppe* lost two *Staffel-*



Ju 87G-1 of 10(Pz)St.G.1;
Russia, September 1943.

10(Pz)St.G.1.



Ju 87D-2, with glider-towing
attachment; 2/St.G.2;
Russia, late 1942.



2/St.G.2



Ju 87D-5 of 3/St.G.77; Russia, winter 1942-43.



7/St.G.1.

Gruppe Stab, 1/St.G.77.



Ju 87D-1 Trop.
of Geschwader Stab, St.G.3;
North Africa, late 1942.
Probably aircraft of Obst. Walter Sigel,
Kommodore St.G.3.



Ju 87D-1 of Slovakian Air Force.



Slovakia.



Ju 87D of Roumanian Air Force.



Roumania.



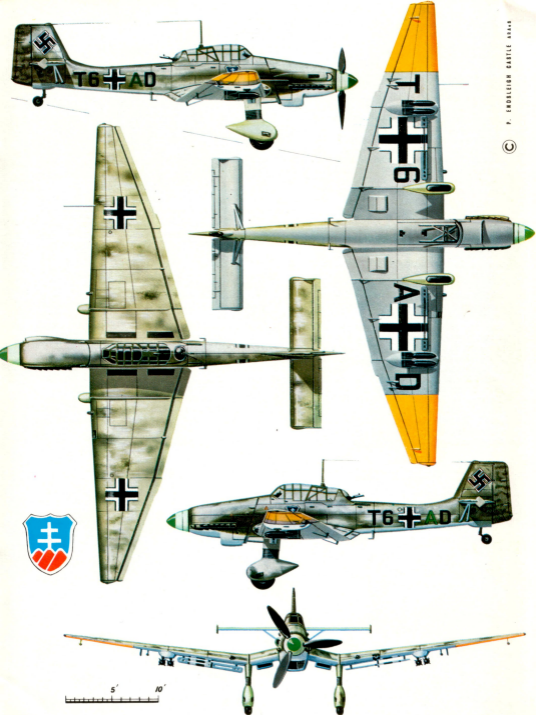
Ju 87D-5 of 102/1 Dive Bomber Squadron, Royal Hungarian Air Force.

Hungary.



Upper surface
of tailplane.





Junkers Ju 87D-5 flown by Obst. Hans-Ulrich Rudel, Gruppen Kommandeur of III/SG 2. Winter 1943-44.

Kapitän, *Oberleutnant* Hans Eichleiter missing on November 14 and *Major* Hans Einwächter and his crew-mate, shot down and killed by a fighter intercept on December 2.

This sudden Allied initiative had an unexpected impact on the siege of Stalingrad as upwards of 400 aircraft were switched from the Eastern Front to help stem the tide in the Middle East. On November 19, the Soviet counter offensive designed to relieve the beleaguered city erupted, and the *Luftwaffe's* hasty evacuation of airfields then taking place in North Africa was now repeated before Stalingrad. Once again, it was the forward-located *Stuka* units that were badly placed, especially those based on landing grounds between the Don and Chir rivers. *Stukageschwader 2* at Kalatch (on the eastern bank of the river Don) was caught in a two-pronged attack on November 21, suffering heavy losses in aircraft, pilots and ground-crew. When those *Ju 87s* which had managed to escape were re-mustered at *Morozovskaya* on November 27, the "*Immelmann*" *Geschwader* had been reduced to the size of a single *Gruppe*. One well-known pilot lost at this time was *Hauptmann* Joachim Langbehn, *Staffelkapitän* of *5./St.G.2*, who was awarded the *Ritterkreuz* the following March.

At the turn of the year, the various *Ergänzungsstaffeln* were starting to receive the *Dora* to supplement earlier variants of *Ju 87* being used for instructional purposes. *Erg.Sta./St.G.1*, then at Nantes in France, with a sprinkling of war-weary *Stukas*—mostly B- and R-2s—now began to use the D-1 as did the other *Staffel* with *St.G.2* at Mariopol in Russia. During January, *II./St.G.3* was also engaged in small-scale missions involving the towing of troop-carrying DFS 230 gliders, training in this task being given initially at the *Flugzeugleistungstelle OBS* (Aircraft Forwarding Centre Commander in Chief South) at Bari in southern Italy. Standard D-3 *trop* aircraft fitted with towing-releases were used for this work.

In the winter of 1942-43, as the Axis retreat continued westwards towards Tripoli and the *Luftwaffe*



A classic case of the dreaded Kopfstand! In this instance, the crew walked away unscathed and the only damage was a shattered aircrew. The aircraft is a D-3, and the "diving penguin" insignia on the rear of the scout car would indicate that the machine belongs to Stukageschwader 1.

(Photo: Bundesarchiv, ref. 501-133-26)

was bled white trying to re-supply Stalingrad, the *Oberkommando der Luftwaffe* was considering ways and means of redressing the balance of air power that by now was coming down inexorably in favour of the western Allies and their Soviet partners. Not only were they deficient in the fighter and bomber field, but also they had no means of countering the increasing numbers of tanks of varying quality that were now being introduced, especially in the East. Nor even were they able to prevent the flea-bite attacks made by slow-flying Polikarpov U-2 (PO-2) biplanes that ranged more or less at will, making nightly nuisance raids on German-held airfields, supply depots and communications located in captured Russian territory. Also, these ancient U-2s were used to reinforce the very active partisan bands that operated behind the lines, often by the simple expedient of low-level,

This view of a Ju 87 D-3 taking off on a mission gives an excellent idea of the location and type of offensive load carried. The out-wing bomb carriers on each side could (as in this photograph) accommodate a pair of 110-lb. bombs on individual slips, or a single 550-lb. missile on the inner 500/XIIC carrier. The under-fuselage rack took a 550-lb. or 1,100-lb. shackled to a 500/XIIC slip or a 2,200-lb. or even 3,960-lb. weapon if a special 2000/XIII carrier (replacing the abortive 1000 carrier mentioned in the narrative) was used, though this restricted use of the outer racks.

(Photo: Bundesarchiv, ref. 393-1409-35)





Flying with wheel spats removed, this Ju 87 D-3, S7+ER of 7./St.G.3, formates for a cameraman of the Propaganda Kompanie (PK—the military arm of Dr. Goebbels' Propaganda Ministerium) over a Russian river. Later in the war, as evident here, in order to reduce the possibility of unit identification by an opponent, the letter/numeral—numeral/letter Geschwader or Gruppe codes in front of the fuselage cross on Luftwaffe aircraft was much-reduced in size and the last individual letter (indicating the Staffel) was rendered inconspicuous or painted out altogether. (Photo: Bundesarchiv, ref. 501-150-21A)



An everyday scene on an airfield of Luftflotte 4, during the winter of 1943-44. A Ju 87 D-5 is started by a cranking handle before taking off on a strike against Soviet infantry. The container under each outer-wing bomb-slip holds 4-4 lb. SD 2 fragmentation bombs. (Photo: Bundesarchiv, ref. 502-183-30)

free-fall airdropping of men (well wrapped in straw) into deep snow drifts.

The first problem was solved by copying the Soviet methods. Various obsolete training and communication types—Arado Ar 66, Gotha Go 145, Heinkel He 46 and He 50 aircraft among them—were formed into *Störkampfstaffeln* (nuisance raiding or harassing Staffeln). Similarly, the subject of nocturnal re-supply and rapid delivery of agents was turned over to the *Forschungsanstalt Graf Zeppelin*, a research centre located at Stuttgart-Ruit, where flight-tests were carried out on a Ju 87 D-3 fitted with large jettisonable overwing men-carrying containers.

Of far more serious concern was the requirement to smash enemy tank thrusts—and especially those of the excellent Russian-produced T-34—from the air. Right from the start of the Nazi campaign against the Soviet Union, it had been apparent that something more accurate and effective than mere small-calibre bombs would have to be found to diminish this

menace. Now, attention was focused on the possibility that the rugged, stable and generally reliable Ju 87 might fit the bill.

Accordingly, in December 1942, a production Ju 87 D-1 (W. Nr. 2552) was fitted with a pair of unwieldy *Flak 18* 37-mm. cannon. These were slung under the wings outboard of each main undercarriage member, and flight-tested at Rechlin. Air-to-ground firing trials against tank targets, carried out by several *Schlacht* and *Stuka* pilots, showed that despite a decrease in general performance and handling qualities, the *Gustav* or 'G'-series Ju 87 had possibilities. That the *Flak 18* was a good anti-tank weapon is undeniable—the secret of its success lay in the excellent ballistic characteristics of its 3-lb. shell coupled with the penetrative qualities of the wolfram-cored explosive round, a combination to which only the thickest-skinned tanks were immune.

In February 1943, *Oberstleutnant* Otto Weiss, an expert ground-attack pilot, was given command of a motley collection of weapons test-beds and ordered to the Eastern Front at short notice to experiment at first-hand with such types as the "P"-series Ju 88s, the Hs 129 B-2/R4 and the G-2/R1, R2 and R4 sub-variants of the twin-engined Bf 110 *Zerstörer* (Destroyer); included in this transfer were several Ju 87 G-1s. These aircraft had one common feature—they nearly all carried one or more *Bordkanone 3-7s*, as the *Flak 18* was generically known—though in a variety of housings, assorted combinations and with various ammunition feeds. The *Versuchsverband für Panzerkampfung* (Tank-Fighting Experimental Unit) was based within the *Luftwaffenkommando Ost* (Air Force Command East) area at Bryansk and, among the pilots placed at Weiss's disposal were *Hauptmann* Hans-Karl Stepp seconded to the *Erprobungsstelle* and *Hauptmann* Hans-Ulrich Rudel of *St.G.2*, who had also flown the G-1 at Rechlin.

The first operational sortie took place on March 18, a day of great ground activity during which the *Luftwaffe* claimed to have knocked out no fewer than 116 tanks in air-to-ground strafing. How many of these were credited to Weiss's pilots is not known, but several Ju 87 G-1s were flown. During April, other attacks were carried out from Bryansk. However, the greater part of the *Versuchsverband* had been ordered to the Crimea where despite losses, under the guidance of Rudel they began to build up a reputation for accurate shooting that soon came to the attention of the OKL.

In February 1943, the Axis forces in the Mediterranean withdrew to Tunisia, with the intention of holding the natural defences of the Mareth line. The little-publicized efforts of the *Stuka* and *Schlacht* units during mid-February are deserving of mention, not only for the courage and flying skill displayed, but also for the efforts of the ground personnel in achieving a high rate of serviceability against all odds. On the night of March 20, the British Eighth Army assaulted the Mareth positions. By March 26 the battle was won and the race for Tunis began. Desperate attempts to stem the tide by II. and III./St.G.3 and the FW 190-equipped III./S.K.G.10 (third Gruppe of *Schnellkampfgeschwader 10*—Fast Bomber *Geschwader 10*) were to no avail, the Ju 87 Staffeln being well-nigh decimated in the process. The remnants

were withdrawn to Sicily during April and soon afterwards transferred again to Greece. So ended the story of the *Stuka* in North Africa. The saga was to continue in the East.

At last, during March 1943, *Stukageschwader 5* began to re-equip with the D-3. It was a bitter joke with the crews based in Finland and northern Norway that they received a new aircraft only when it was declared unfit for service elsewhere, and there seems to have been some truth in this. Certainly, all branches of the *Luftwaffe* in this Arctic region operated marks of aircraft of considerable obsolescence. Even *St.G.5* was, at best, a truncated *Geschwader*, only *I. Gruppe* with Ju 87 R-2 and R-4 variants being operational.

On June 2, a mass *Stuka* attack on the station and marshalling yards at Kursk was mounted, opened by Knight's Cross holder Major Friedrich Lang, *Kommandeur of III./St.G.1*. Caught by surprise, the take-off signals from the Soviet airfields defending Kursk were only fired as the *Gruppe* flew across the town to get into its preparatory diving position. As, one by one, the Ju 87s peeled-off into their dive, Russian fighters were climbing towards them, the first reaching the *Stukas* just as they began to pull out. One interceptor was shot down and *III. Gruppe* escaped unscathed. Above Kharkov on the same day, *II./St.G.77* was not so fortunate, *5. Staffel* losing a D-3 to fighters, four more Ju 87 Ds of *6. Staffel* failed to return, whilst the *Kommandeur of I./St.G.3*, *Hauptmann* Horst Schiller, also flying a D-3 was shot down by *flak* and posted missing. He was awarded a belated *Ritterkreuz* in June 1944.

On July 5, "Operation *Zitadelle*" was mounted. In this great loop of Russian territory—the Kursk salient—was about to take place the greatest tank battle in history, a conflict that was to end in the virtual extinction of some of the finest motorized divisions in the German Army and *Waffen SS*. It was to see the first large-scale use of ground-attack aircraft directed against concentrated waves of armoured fighting vehicles. It was also to sound the death knell of the Ju 87 as a dive-bomber.

Spearhead of this force was *VIII. Fliegerkorps* which, together with *I. Fliegerdivision*, mustered 1,830 combat-ready aircraft. The dive-bomber and ground-attack component comprised *Stukageschwader 1*, 2 and 77 with a total of nine *Gruppen*, and *Schlachtgeschwader 1* with two FW 190 *Gruppen* plus one of Hs 129 Bs. Four more Hs 129 *Staffeln* were to be used in a specialized anti-tank rôle. Fighter cover was provided by *J.G.3* and *J.G.52* with a total of six Bf 109 G *Gruppen*, while both *J.G.51* and *J.G.54* were to weigh in with their highly-prized FW 190s. *K.G.1*, *K.G.3* and *K.G.51* together supplied five Ju 88 bomber *Gruppen* and 10 more *Gruppen* of He 111s were drawn from *K.G.4*, *K.G.27*, *K.G.53* and *K.G.54*. Additionally, *Panzerjägerstaffeln* (a development of the successful *Verband* pioneered by *Oberstleutnant* Weiss) of specialized anti-tank aircraft were added to selected fighter and dive-bomber units, examples being the *Pz.J.Sta. of Zerstörergeschwader 1* equipped with Bf 110 G-2s at Bryansk and the first operational *Staffeln* of Ju 87 G-1s (*Pz.J.Sta./St.G.1* and *Pz.J.Sta./St.G.2*).

As the German forces jumped off, their portable ground-based radar detected waves of Soviet aircraft



Caught by the north Russian sun, a Dora of the *Gruppenstab of Stukageschwader 5*, coded *IJ+CB*, on the battle order of *Luftflotte 1*, peels off to attack a target in the tundra below.

(Photo: Bundesarchiv, ref. 460-176-3)

heading in the direction of the massed *Panzers*. Every available German fighter was scrambled from airfields in the area of Kharkov and south-west of

An anonymous pilot of *Schlachtgeschwader 77* receives warm congratulations after his 700th operational mission. In the background is his aircraft, Ju 87 D-5, W. Nr. 131998.

(Photo: Bundesarchiv, ref. 501-129-8A)





VIII. Fliegerkorps and Stukageschwader 77 are almost synonymous in the wartime annals of the Luftwaffe, the latter unit having formed the backbone of this "fire brigade." Fliegerkorps throughout most of the German Air Force's campaigns. So it was fitting on the occasion of St.G./S.G.77's 100,000th operation that Generalleutnant (later General der Flieger) Hans Seidelmann, the Fliegerkorps' Commander, should be invited to the celebration. Here he takes the salute accompanied by the Kommodore, Oberstleutnant Helmut Bruck, soon after the unit had been re-designated Schlachtgeschwader 77.

(Photo: Bundesarchiv, ref. 503-240-23A)

Belgorod to combat this menace. Consequently, one of the largest air battles of the entire war then developed, with claims of some 120 Russian aircraft being shot down. During this day, *Hauptmann* Rudel, flying a G-1 with *Pz.J.Sta./St.G.2*, accounted for no fewer than 12 Russian tanks in the area of Belgorod; every *Stuka* unit flying five or six sorties. In vicious air fighting on the late afternoon of July 5, the Russians lost another 110 aircraft, the *Luftwaffe* wastage being low in comparison with the numbers committed and their own victory claims. Hour after hour, throughout the long summer days, the sorties went on, but the *Stuka* losses were mounting. The low-level, ground-attack missions against Soviet tanks now well protected by light anti-aircraft weapons (and cleverly camouflaged and even carrying decoy smoke pots to

"Geschwader 77 100 000 X gegen den Feind"—to the uninitiated, this Gothic-lettered sign mounted above a garlanded *Dora* might not mean very much. To the aircraft and ground personnel of Schlacht (formerly *Stuka*) Geschwader 77 in the spring of 1944, this was a milestone. They were celebrating the Geschwader's 100,000th operational flight—all of them flown with the Ju 87, though the first conversions to the FW 190 were about to be made.

(Photo: Bundesarchiv, ref. 501-132-37)



give the attacking pilots the impression that they were already damaged), was risky for the fast and manoeuvrable FW 190s and dangerous in the well-armoured Hs 129s. For the outmoded and slow Ju 87s, the chances of coming through unscathed were slim indeed.

On July 7, *Hauptmann* Kurt-Albert Pape, newly decorated with the *Ritterkreuz*, crashed in flames to his death after being hit by flak; 3./St.G.1 losing yet another *Staffelkapitän*. The next day, *Hauptmann* Bernhard Wutka, a Knight's Cross holder and leader of 9./St.G.2, was hit by return fire from a tank he was attacking, crashed and was killed. On July 11, as the Russians committed vast numbers of new troops to the fray, *Hauptmann* Rudolf Blumenthal, *Staffelkapitän* of 9./St.G.77, fell to the guns of Soviet fighters. The reserves thrown in by the Red Army on this day tipped the balance despite every effort of the *Luftwaffe* to stem the flood of enemy armour.

On July 13, the Allies invaded Sicily, and recalling both *Feldmarschalle* von Kluge and Manstein to his headquarters, Adolf Hitler demanded that *Zitadelle* be called-off and the forces thus released to be transferred to the Mediterranean. Easier said than done. Locked in mortal combat, the two tank armies fought on. The pressure of Russian air attacks mounted day by day. On July 17, 26-year old *Hauptmann* Walter Krauss, *Kommandeur* of III./St.G.2 (another Knight's Cross recipient), was killed by fragmentation bombs dropped on Orel airfield by a nocturnal U-2 biplane. His command was then taken over by *Hauptmann* Rudel. Finally, on July 21, *Oberleutnant* Willi Hörner, a *Ritterkreuzträger* for only two months and *Staffelkapitän* of 7./St.G.2, crashed and died in Ju 87 D-5 (W. Nr. 130507). This *Dora* was one of a handful of the new variant just beginning to come off the production lines, and only flown by III./St.G.2 during the Kursk offensive.

Concurrently with the re-equipment of the front line *Stukageschwader* with D-3 and newly issued D-5s, units that had hitherto used other aircraft types now began to phase in re-furnished Ju 87 Bs still on the *Luftwaffe*'s inventory. II./*Luftlandgeschwader*, originally a paratrooper-dropping arm but now used mainly on the East Front for supply work, began to receive Ju 87s for DFS 230 glider-towing, thus replacing the graceful but venerable Czechoslovak Avia B.534 biplanes hitherto used as tugs. The night-harassing *Staffeln*, which had now been accepted as a viable force by the OKL planners, also started receiving Ju 87s, 4./*Störkampfstaffel* Lfl. 4 having one as early as July 1943. Even the *Verbindungsstaffeln* (the communications units) up till now flying Fi 156 *Storch* (Stork) short-take-off aircraft, plus longer-range Ju 52/3m and FW 58 *Weiß* (Kite) two-motor aircraft, now started to employ Ju 87s as "backs". Last but certainly not least, the Axis satellite air arms began to receive front-line *Stukas* of the same quality as those flown by the *Luftwaffe*. Ju 87 D-3s were first operational with the 3rd Squadron of the Royal Rumanian Air Force's Dive-Bomber Group at Bagerowo towards the end of July 1943. By the following month, 102/1 *Zuhanóbombázó Század* (102/1 Dive-Bomber Squadron) of the Hungarian Air Force was flying D-5s from Gomel against Soviet partisans. At a later date, both the Royal Bulgarian

Air Force and the Croatian Air Force Legion were to use the *Dora*.

On August 19, *Generaloberst* Hans Jeschonnek, Chief of the *Luftwaffe* General Staff, shot himself. One of the first moves of his successor, *Generaloberst* Günther Korten, was to institute new posts of *Waffengenerale*, or Air Officers in Command of specific areas of front-line activity. Hitherto, the small ground-attack component had been a poor relation of the day-fighter sector, whilst the *Stuka* units were a component part of the overall bomber arm. Now, both *Schlacht* and *Stuka* units were merged under a new *General der Schlachtflieger*, *Oberst Dr. Ernst Kupfer*, the energetic 36-year old former *Kommodore* of *Stukageschwader* 2. On October 5, 1943 was issued the Top Secret Order No. 11125/43 of *Oberkommando der Luftwaffe*, 2. *Abteilung* which brought into being the re-constituted *Schlachtgeschwader*. Two days later, another edict went out setting-up a series of *Nachtschlachtgeschwader* (Night Ground-Attack *Geschwader*) produced by the merger of the numerous *Störkampfstaffeln* and sundry other *ad hoc* units.

Before he could see how this re-shaping of the *Schlachtflieger* was to function, *Oberst Dr. Kupfer* was killed. His He 111 H-6 crashed in the Belasica mountains when bound for Salonika on November 6. Kupfer's place was temporarily taken by *Oberst* Hubertus Hitschold, a veteran ground-attack pilot, who did an excellent job with the limited resources available at his disposal, getting his just reward on New Year's Day 1945, when was he confirmed not only in his post as *General der Schlachtflieger*, but also awarded the *Eichenlaub* to his *Ritterkreuz* and, at the age of 33 years, promoted to *Generalmajor*.

With the coming of Hitschold, the move to phase-out the Ju 87 for day work was accelerated, its place being taken by ground-attack versions of the excellent FW 190 single-seat fighter. By June 6, 1944 when the Allied invasion of Northern France was launched,



Schlachtflieger receive the *Ritterkreuz* in the field. *Hauptmann Kurt Lau* and an unidentified *Oberfeldwebel* (probably *Heinrich Meyer* or *Wilhelm Noller*) after being decorated in April 1944. Both were members of I./S.G.2 then flying Ju 87 Ds from Rumanian airfields. Hptm. Lau's official award date was April 6, 1944. He ended the war flying with II./S.G.103.

(Photo: Bundesarchiv, ref. 504-243-22A)

three of the *Schlachtgeschwader* (S.G.4, 5 and 10) were fully converted to FW 190s, while the remainder, apart from IV./S.G.9 (a purely Hs 129-equipped *Gruppe*), were in the process of giving up their Ju 87 Ds for the FW 190. Only Rudel's D-5 equipped III./S.G.2 plus the specialist tenth *Panzerstaffeln* allotted to S.G.1, 2, 3 and 77 operating *Flak 18*-armed G-1s and G-2s (the former a modified D-3, the latter a refurbished D-5) were to retain the old *Stuka* by the end of the year.

The *Dora* was now dominant in the night ground-attack rôle, 300 surviving D-3 and D-5 variants being re-engined with 1,500 h.p. Jumo 211 P motors fitted

Teen-age Ju 87 D pilots assemble for a final briefing. The appalling losses in North Africa and on the Eastern Front resulted in a tremendous turnover of personnel, most of the experienced and older pre-war *Luftwaffe* aircrew having been killed or wounded. Hence the extremely youthful faces in this line-up.

(Photo: Bundesarchiv, ref. 501-149-13A)



with heavy flame-damped exhausts led back over the wing roots. These were re-designated D-7 and D-8 respectively. This up-dating of the *Stuka* was carried out by the Hamburg-Harburg firm of Menibum. Small numbers of Ju 87s were also converted as unarmed two-seat trainers, the rear-gunner's position being deleted and full dual-controls installed. Vision for the instructor was improved by the fitting of a sideways-bulged canopy. Thus was born the 'H'-series Ju 87. The H-1, H-3, H-5, H-7 and H-8 were training variants of the normal D-series.

On every front, as the war drew to its inevitable conclusion, the sturdy and reliable Ju 87 was still to be seen flying from forward German airfields. In the West and in Italy it operated almost exclusively at night. An exception was during the final *debauch* over the Remagen railway bridge in March 1945, when suicidal day missions were carried out by *Nachtschlachtflieger*, some from Lippe airfield where a lone *Staffel* of Ju 87s, caught taxiing on the ground by USAAF fighters, was destroyed. On the Russian Front, the *Panzerknacker* (Tank Cracker) Ju 87 G was still a silhouette for any Soviet vehicle commander to dread. Although burdened with a task akin to that of holding back the sea with a pail, a handful of former dive-bomber pilots fought on till the very last day of the war.

Year by year, early in September, an unfamiliar shape is wheeled out of a hangar at St. Athan Royal Air Force Station and exposed to the gaze of a curious public. *W. Nr.* 2883, once just an ordinary Junkers Ju 87 D-3 *trop* flown under a hot North African sun by an equally anonymous crew, but now the sole survivor of an extinct breed of *Doras*, is paraded on successive Battle of Britain Days to remind a generation then not born of the price paid by the Royal Air Force (and other American, Commonwealth, Soviet and European airmen) in the struggle against Nazism, of which the ugly, crank-winged *Stuka* is still such a potent symbol.

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Hans-Ulrich Rudel, photographed in Russia during the winter of 1943-44 when a Major and Kommandeur of III./S.G.2 "Immelmann." He is wearing the insignia of the Knight's Cross with Swords and Oakleaf. Certainly the most famous Stuka pilot of all time, Rudel went on to win not only the Diamonds to his Ritterkreuz, but on January 1, 1945, was awarded a special "Golden Oakleaf," the only member of the German Armed Forces to be given such an honour. When he flew to Kitzingen to surrender to the Americans in May 1945, his logbook showed 2,530 operational sorties during which he claimed to have destroyed no less than 519 tanks.

(Photo: Bundesarchiv, ref. 501-183-8A)



Oberfeldwebel Erwin Hentschel, awarded the Ritterkreuz on December 9, 1943, was one of the few Ju 87 radio operators to be given this coveted decoration. Best known as Rudel's gunner, Hentschel flew over 1,200 missions whilst with III./St.G.2 (later III./S.G.2), before he was drowned swimming the icy river Dniester on March 21, 1944, following a landing that he and Rudel had made in a D-5 to pick up a fellow crew which had made a forced landing on the Soviet side of the river during an attack on the bridge at Jambol, only to find that their aircraft could not take off owing to the thick mud. Rudel and the other two personnel managed to swim the Dniester safely.

(Photo: Bundesarchiv, ref. 502-184-9A)



A Ju 87 D-5 of the 11th Squadron, 3rd Air Regiment, Slovak Air Force at Piesčany airfield during 1944. Allied to the Germans, the Slovaks employed a small number of Stukas, these aircraft carrying their national marking of blue cross on a white background with a red circle at the cross's centre, on the fin. Much detailed planning was done by the RLM to utilize the Czech aircraft industry as a producer of Ju 87s, but only a handful built from parts supplied by Weser were assembled at a factory at Kolbra, near Trenčín in West Slovakia. After the war, the reborn Czech Air Force used abandoned Luftwaffe Ju 87s as instructional ground-trainers designated B-37.

(Photo: via Zdenek Titz)



Straight from a major overhaul, this Dora of III./S.G.2 awaiting a fuelling bowser before being taken up on an air-test, exhibits the type of winter paintwork which was to be seen on most aircraft flown by the Schlachtflieger during the long period of cold weather in 1943-4. The brush marks have been liberally applied over all surfaces, even the fuselage Balkenkreuz collecting its share of camouflage dope.

(Photo: Bundesarchiv, ref. 502-184-6A.)

SPECIFICATION

Junkers JU 87 D-1 Dive-Bomber

Dimensions

Span 45 ft. 3½ in.; length 37 ft. 8½ in.; height 12 ft. 9½ in.; wing area 343.4 sq. ft.

Crew

Two: 1 pilot and 1 radio-operator/air-gunner. Sitting back-to-back.

Powerplant

One 1,400 h.p. Junkers Jumo 211 J 12-cylinder liquid-cooled engine; Junkers VS 11 3-blade wooden propeller. 87 octane fuel. Interva 100 oil.

Armament

Two fixed 7-92-mm. Rheinmetall-Borsig MG 17 machine-guns, one in each wing firing forward. 1,000 rounds of ammunition per gun. Revolver C12/C or D gun-sight. One 7-92-mm. Mauser MG 81 Z (twin MG 81) machine-gun on GSK-K 81 flexible mounting hand-held by gunner in rear turret. 2,000 rounds of ammunition. VE 22 B gun-sight. Additionally, a Waffenbehälter 81 (WB 81) A or B could be carried under each wing. This was a supplementary weapons pack of size and aerodynamic form similar to a 1,100-lb. bomb, containing three MG 81 Z machine-guns inclined downwards at 15° (A) or firing forward with zero degrees inclination (B) plus trays of ammunition, 250 rounds per gun.

The D-1 could carry up to 1,800 kg. (3,968 lb.) of bombs in various combinations. Midway between the undercarriage-fairings and the wing-tip were three bomb slips (two for 110-lb. bombs, the centre one for a 550-lb. load); under the main fuselage was a slip capable

A Rumanian Dora. No. 34a was but one of a substantial quantity of Ju 87 Ds in service with the Royal Rumanian Air Force from July 1943 till the anti-Axis coup d'état in August the following year. At that time, a total of 60 D-3s and D-5s were still being operated within the Luftflotte 4 area against the Russians by the 3rd and 6th Rumanian Dive-Bomber Groups.

(Photo: Bundesarchiv, ref. 498-40-16)





Nicknamed the Panzerknacker—"tank cracker"—by its crews, the hitherto unillustrated G-2 version of the Flak 18-equipped Junkers 87 was initially re-built in a series of 199 by Weser Flugzeugbau at Bremen, but another 40 were on order by the time the first of the initial contract was delivered at the end of 1943. This aircraft belongs to 10.(Pz)S.G.3, a Staffel which won two Knight's Crosses—the first by Feldwebel Josef Bluemel, the other by Unteroffizier Rainer Nassek.

(Photo: Bundesarchiv, ref. 463-364-12)

of carrying a 3,968 lb. PC 1800 bomb. For attacks on ground troops, etc., the outer slips could also carry a wooden container housing ninety-two 4-4-lb. anti-personnel bombs. 66-gallon drop tanks could also be fitted to these slips.

Weights (with B-2 undercarriage in parentheses)

Empty 10,803 lb. (9,700 lb.); normal loaded 13,007 lb. (11,133 lb.); maximum overload 14,550 lb. (12,787 lb.).

Strength Group

H 5

Performance

Maximum speed 255 m.p.h. at 13,800 ft.; cruising speed 198 m.p.h. at 15,700 ft.; most economical cruising speed 115 m.p.h.; climb to 16,400 ft. in 19-8 minutes; normal range 510 miles at 13,500 ft.; maximum range 954 miles at 16,730 ft.; service ceiling at 12,800 ft. weight 23,950 ft.



Ground personnel of a Panzerjägerstaffel servicing the port 37 mm. Flak 18 cannon of a Ju 87 G-I.

(Photo: via the author)

How are the mighty fallen. Junkers Ju 87 D-5s partially hidden amongst trees on a Fliegerhorst following the German surrender in May 1945. All these aircraft show signs of lengthy exposure to the weather and had been sabotaged with incendiary grenades.

(Photo: U.S. Air Force, ref. War Theatre 12, No. 2168)





Photographed at an airfield west of Innsbruck, Austria, during June 1945, this Ju 87 D-7 (a refurbished D-3 with Juno 211 P motor) is easily identified by the large flame-dampers exhausting over the wing roots. Used by the Nachtschlachtflieger in substantial numbers, these machines operated against the Allies until the last days of the war. Neither the designation nor the purpose of the cylindrical store carried by this particular aircraft have yet been discovered. (Photo: U.S. Air Force, ref. 57926 AC)

Luftwaffe units still operating the Ju 87 D and G, March-April 1945

*Probably three Si 204 Ds in this figure

Command	Date	Unit	Aircraft Establishment	On strength	Service-able	Establishment	Crews Number available	Operational	Operations flown during the day
(a)	30.3.45	N.S.Gr.1	62	32	25	44	44	23	23
(a)	26.3.45	N.S.Gr.2	62	28	15	54	54	33	15
(e)	1.4.45	III./S.G.2	42	34	34	59	59	41	34
(e)	1.4.45	10.(Pz)/S.G.2	12	20	20	20	20	12	12
(e)	1.4.45	10.(Pz)/S.G.77	12	14	11	16	16	11	11
(e)	1.4.45	3./N.S.Gr.4	20	18	14	18	18	14	14
(f)	1.4.45	Stab./N.S.Gr.4	2	4*	3	6	6	6	3
(f)	1.4.45	2./N.S.Gr.4	20	10	9	16	16	13	9
(g)	1.4.45	2.(Pz)/S.G.9	12	19	15	14	14	13	13
(g)	1.4.45	N.S.Gr.8	62 ^a	43 ^b	37 ^a	49	49	39	37
Note ¹ Mixture of Ar 66, Ju 87 and Go 145 a/c.									
² 34 x Ju 87, 7 x Go 145, 2 x Ar 66									
³ 33 x Ju 87, 2 x Go 145, 2 x Ar 66									
(b)	31.3.45	N.S.I.Fl.Kps	20	12	6	13	13	13	6
(c)	31.3.45	Stab./N.S.Gr.10	2	2	2	3	3	3	2
(c)	31.3.45	1./N.S.Gr.10	20	18	17	27	27	24	17
(d)	1.4.45	Stab./N.S.Gr.9	2	1	0	1	1	1	0
(d)	1.4.45	2./N.S.Gr.9	20	10	10	9	9	6	6
(d)	1.4.45	3./N.S.Gr.9	20	16	15	13	13	10	10
(d)	1.4.45	Flz. Reserve	2 (Ju 87 D-5)						
(h)	12.4.45	2.(Pz)/S.G.9 ^a	12	17	16	14	13	13	13
Note ⁴ On 1.4.45 2.(Pz)/S.G.9 was operating on the Eastern Front with I./Kdo.6, but 12 days later had transferred to Scandinavia under I./Kdo. Nordost.									
(h)	12.4.45	1./N.S.Gr.4	20	13	11	19	18	18	11
(i)	12.4.45	N.S.Gr.8 ^a	62 ^a	45 ^b	40 ^a	52	52	47	40
Note ⁵ On 1.4.45 N.S.Gr.8 was operating on the Eastern Front with I./Kdo.6, but 12 days later had transferred to Scandinavia under I./Kdo. Nordost.									
⁶ 29 x Ju 87, 8 x Go 145, 3 x Ar 66.									
^a Mixture of the Ar 66, Ju 87 and Go 145 a/c.									

Key to Luftwaffe overall Commands (based on a geographical area)

- (a) Luftflottenkommando Reich (Luftwaffenkommando West: 15. Fliegerdivision). Western Front. Both N.S.Gr. 1 and 2 were operated as a joint unit under the designation Gefechtsverband Hallensieben.
 (b) Luftflottenkommando 4 (I. Fliegerkorps). Eastern Front.
 (c) Luftflottenkommando 4 (17. Fliegerdivision). Eastern Front.

(d) Kommandierender General der Deutschen Luftwaffe in Italien. Italian Front.

(e) Luftflottenkommando 6 (VIII. Fliegerkorps). Eastern Front.
 (f) Luftflottenkommando 6 (3. Fliegerdivision). Eastern Front.

(g) Luftflottenkommando 6 (II. Fliegerkorps). Eastern Front.

(h) Luftflottenkommando Nordost (I. Fliegerdivision). Scandinavia.

(i) Luftflottenkommando Nordost (4. Fliegerdivision). Scandinavia.