

An aerobatics demonstration during the 1931 Cleveland Air Show convinced German flyer Ernst Udet of the military worth of a new type of maneuver and led him to support the development of the aircraft that would become synonymous with Nazi aggression during World War II.

The STUKA Story

BY THOMAS HAJEWSKI



IN January 1942, during the state funeral for Ernst Udet, World War I fighter ace and *Generalluftzeugmeister* (Director General of the Luftwaffe) Hermann Göring spoke eloquently about the fallen hero's deeds. He praised his accomplishments in the Great War, his sixty-two air victories—second only to Baron von Richthofen—and his total dedication in helping to build Hitler's air force. Yet Göring's highest praise was bestowed on his former comrade's support for and development of a specific type of aircraft, the offensive weapon without which the Blitzkrieg tactics used in Poland, France, and later Russia during the first years of the war would have been impossible.

This new plane was dubbed a *Sturzkampfflugzeug*, literally a "diving fighting plane," a designation originally used by the Germans for any aircraft used as a dive-

bomber. Only later was it specifically applied to the Junkers Ju-87. In the military jargon of the day, the longer *Sturzkampfflugzeug* was shortened to *Stuka*, the aircraft that has become synonymous with German aggression in World War II.

Both the Junkers Ju-87 Stuka as well as the technique of dropping bombs while plunging earthward at speeds often in excess of 350 mph had an unusual, highly controversial developmental history. More than once the entire project was nearly scrapped. German prewar propaganda and secrecy have clouded so much of this interesting phase of aviation history that even now, nearly fifty years after the beginning of World War II, new facts regarding the Stuka and its development are coming to light.

Prowess of the Hawk

On September 27, 1933, Ernst

Udet was at the Curtiss-Wright factory in Buffalo, N. Y., supervising the disassembly and crating of two brand-new Curtiss BFC-1 Hawk aircraft for shipment to Germany. Udet had actually seen the spunky double-winger for the first time two years before, at the Cleveland Air Show, and was greatly impressed by the trim craft's maneuverability and steep diving ability.

During the show, the Hawk (called the *Falken* by the Germans) plunged nearly vertically like a stone, pulled out of its dive only a few hundred feet above the ground, only to begin its upward climb anew and repeat the same series of maneuvers to the cheering of the crowd below.

Udet appreciated what such a plane would mean to his own program of aerobatics (he was an accomplished stunt flyer, one recognized worldwide for his heart-stop-

The German Ju-87B, shown here in prewar markings, played an integral part in German Blitzkrieg tactics. (Photo courtesy of United States Air Force Museum)



ping performances) and was afraid that some last-minute problem or difficulty with the American authorities might prevent him from acquiring the Hawks.

The military significance of the plane must also have seemed matter of fact to the veteran airman. The Hawk could dive at a target on the ground or at a warship at sea and, *aiming with the aircraft itself*, strike its objective with a single, well-placed bomb. It would continue to remain a mystery to Udet why the American military had not yet exploited the dive-bomber to any appreciable extent up to this point.

Wanting the planes for his own show and actually purchasing them, however, were two different matters. Together, the pair of Hawks cost more than \$30,000, an amount decidedly beyond the reach of the flamboyant, fast-spending Udet. How could he possibly raise such a sum?

Political changes within Germany and the rise to power of the National Socialists provided an answer. Hermann Göring, himself a decorated pilot in World War I, became Hitler's *Reichskommissar für Luftfahrt* (Chief of Aviation) and secretly began to build a new Luftwaffe. Hearing of Udet's interest in the new American craft and himself cognizant of its possible military applications, Göring told Udet to purchase the Hawks. The Nazi party would pay the bill, he said.

When the two planes were crated and ready for shipment, Udet hesitatingly assured the Curtiss-Wright sales director that payment would be forthcoming as soon as he had contacted the proper German authorities.

"But, Mr. Udet," the American replied, "the money has already been deposited in our bank!" The next day both planes were in the hold of a freighter and on their way to Hamburg.

Göring had placed only one stipulation on the sale: Both craft were to be given a thorough testing and structural analysis by Luftwaffe engineers before being handed over to Udet for his stunt-flying program, a condition to which Udet quickly agreed.

The Tests Begin

Testing of the Hawks began in December 1933 at the Luftwaffe base at Rechlin, north of Berlin, with Udet, at this point still a civilian, at the controls during the initial flights. The tremendous stresses on both machine and pilot became evident from the outset. Udet had to be physically lifted from the cockpit after the first dives, so completely had the spine-wrenching plunges and pullouts exhausted him. Further test dives by other pilots produced similar results. The maneuvers approached the maximum limits endurable by both man and machine.

The *Technisches Amt* (Technical Branch) of the Luftwaffe was quick with its decision—the plane and the concept of near-vertical dive-bombing were rejected outright as being impractical, dangerous, and completely unsuitable for military application, a verdict that for the moment seemed overwhelmingly decisive and irreversible.

Undaunted, Udet took possession of the two Hawks and continued to fly them while perfecting his diving technique to the point where he was ready to incorporate the maneuver into his aerobatics show the following summer. However, during one of his last practice runs over Berlin's Tempelhof Airport, the Hawk failed to respond to the controls at the end of a steep dive.

Just before the plane tore into the ground, Udet bailed out, his parachute opening scant yards from certain death. As on a dozen previous occasions in his life, the veteran flyer was again able to walk away from a crash. This time, however, several days of recuperation in a hospital seemed to indicate that his own personal luck might be taking the same course as his dream of sustained vertical diving with an aircraft.

It remains a matter of speculation exactly to what extent Udet was aware at this time of the Luftwaffe's already decisive commitment to the concept of the dive-bomber and of parallel developments regarding it in other parts of the world. There is little doubt that certain circles within the new German Air Force were keenly aware of the military effectiveness of the Stuka and were secretly pushing for the development of suitable aircraft that could be adapted for dive-bombing. In fact, the United States Navy had been conducting similar tests with near-vertical bombing during the early 1930s, and it is a matter of record that the Japanese Navy was doing the same.

The German firms Junkers and Heinkel, specifically interested in foreign export contracts, had begun development in their Swedish and Russian branch factories of aircraft types that would be capable of dropping bombs while diving. Junkers had fitted its K-47 two-seater with dive brakes, and Heinkel produced its He-50 double-winger for possible Japanese export. Both had been thoroughly tested at Lipetsk in the Soviet Union and had proven so successful in support of ground troops that improved models of both planes were requested. Further testing of vertical bombers was given top priority.

Considering the fact that Ger-

many was in violation of the Versailles Treaty by pursuing military aircraft development and testing since as early as 1926, the secrecy surrounding its dive-bomber program is understandable. Could Udet have been uninformed of what was going on in more official circles of the new Luftwaffe? Had Göring engineered a public rejection of Udet's demonstration dives in the Hawk as an additional cover-up, further shielding from foreign powers what direction German aircraft research and development was, in actuality, taking?

There seems little doubt that Udet's vision of a military aircraft suitable for dive-bombing had already been preordained by certain factions within the new Luftwaffe.

New Designs

By 1933, German Heinkel He-50 aircraft were being organized into dive-bomber groups, and in the same year, the firms of Fieseler and Henschel were ordered to begin designing an aircraft specifically as a dive-bomber. The engineers were clear from the first as to exactly what the new plane's capabilities had to be in order to play a role in future combat situations.

The aircraft would have to be sturdy enough to withstand dives of up to 350 mph. It would have to be equipped with dive brakes to prevent exceeding this speed, considered at the time to be a maximum at which plane and pilot could safely function.

Finding a suitable engine would present further problems, for no powerplant greater than 600 hp could be made available in the near future. This meant that the aircraft would be especially vulnerable to attacking enemy fighters because of its relatively slow speed in level flight and especially while pulling out of a dive.

To counter this, it was decided to provide space for a second crew member, a machine gunner, whose job it would be to provide covering fire against enemy aircraft attacking from the rear. Step by step, with traditional German thoroughness, each technical problem was worked out until, by early 1935, Luftwaffe designers had a definite idea of the new bomber's specifications.

One of the opponents to the direc-

tion Stuka design was taking was the head of the developmental section within the Luftwaffe's Technical Branch, Maj. Wolfram Freiherr von Richthofen, a cousin of the famous World War I ace. It was his contention that existing aircraft types being considered for use as dive-bombers, such as the He-50, Hs-123, and the Fi-98, as well as planes still on the drawing boards, were or would all be vastly underpowered and thus unable to avoid pursuit by enemy fighters. Since dive-bombing accuracy could only be assured from heights of less than 3,000 feet, this would also make the Stuka too easy a target for enemy ground flak. Also, he believed, pilot stress would be far too great.

Richthofen proposed a larger, multiengine, much faster aircraft, one able to speed away from attacking fighters and much less vulnerable to anti-aircraft fire from the ground. Planes like the Junkers Ju-88 or the Messerschmitt Me-210 were the types he envisioned, but these would only make their appearances years in the future. Germany would need a production-line dive-bomber much sooner.

Proponents of the present Stuka program, its design engineers and especially Generalmajor Walther Wever, *Generalstabchef der Luftwaffe* (Chief of Staff), shared few of Richthofen's apprehensions. They saw in the new plane a great opportunity to improve the accuracy of bombs dropped. A few Stukas could achieve much better results than an entire squadron of horizontal bombers, a proposal that appealed to traditional German efficiency and thrift and one that would be crucial in light of Germany's limited natural resources.

Because Germany lacked overseas sources of raw materials, self-sufficiency would again, as in World War I, become the watchword. A few well-placed bombs would be much more effective and far less wasteful than many haphazardly dropped.

Despite dissenting voices, the Technical Branch decided to proceed with the dive-bomber's design, and in April 1935, the firms of Arado, Blöhm und Voss, Heinkel, and Junkers were requested to begin work on dive-bomber prototypes.

Junkers already had a clear ad-

vantage. Two years earlier, the company's chief engineer had designed an aircraft, the Ju-87, which fit Luftwaffe specifications. Construction of the prototype could begin at once, and many of the new plane's features could be directly implemented from those of the company's earlier K-47 and K-48 models, planes that had already proven successful in vertical dive tests.

As a result, only a few months were needed to build the first Ju-87 V-1 (*Versuchsmodell Nr. 1*—Prototype Number One), and by the fall of 1935, the plane was already being put through a grueling series of dives, each one a degree steeper than the previous. Despite the crash of the plane several months later after its rudder and stabilizer shredded during a dive of more than eighty degrees, Junkers engineers were quick to follow with further improved models, the V-2 and V-3.

Still the Stuka Advocate

In January 1936, Udet entered the Luftwaffe as a colonel. Officially his title was *Inspekteur der Jagdflieger* (Inspector of Fighter Aircraft), yet unofficially, still a major Stuka advocate, he would now be in a position to supervise personally his real area of interest—dive-bomber development.

In March, comparative testing began at Rechlin. Arado's design, the Ar-81 double-winger, had no chance against the Junkers Ju-87 or the Heinkel He-118, both monoplanes. The Heinkel was a sleek design, featuring retractable landing gear. Capable of carrying a 500-kg bomb in a fuselage bay, it was thirty mph faster than the Junkers, which had nonretractable gear and carried its bomb load externally. But the Junkers was a sturdier aircraft and, unlike the Heinkel, could dive at an angle of eighty degrees, a prerequisite for accurate bomb-aiming.

Richthofen, still head of the Technical Branch, preferred the He-118, Udet the Ju-87. The problem was neatly resolved, however, on June 10, 1936, when Richthofen was promoted to chief of staff of the newly formed Condor Legion and transferred to Spain. Udet took over his position as head of the Technical Branch. Later that same month, Udet himself took the controls of the He-118 and proceeded to put it

through yet another dive test. The propeller sheared off, and again Udet had to bail out before the plane crashed. Udet, therefore, had made the final decision himself: His preference, the Ju-87, would become the Luftwaffe's new operational dive-bomber.

Orders for 262 Ju-87A-1s were placed immediately, and by 1937, three Stukas had been sent to Spain and were actively engaging in combat missions against Republican units. More Stukas were to follow. The precision with which the planes were able to strike ground targets impressed even the still-less-than-optimistic Richthofen, and he ordered the crews of the three Ju-87s to be changed often in order for as many flyers as possible to gain experience in the aircraft.

Further Stuka successes in Spain continued to stimulate dive-bomber research and development. The

older A models. This newer plane had a 1,150-hp engine, which resulted in a maximum bomb-carrying capacity of 1,000 kg. Despite a relatively short action radius of 125 miles at 180 mph, the planes were more than adequate for the ground-support missions they were required to perform.

By the time hostilities broke out with Poland on September 1, 1939, the Luftwaffe had more than 300 Ju-87B and thirty Hs-123 aircraft ready for deployment as operational dive-bombers.

The Neuhammer Catastrophe

On August 15, 1939, just two weeks before the planned invasion of Poland, an event took place that was again to cast serious doubt on the feasibility of using Stukas in a major combat role. At Cottbus air-drome in Silesia, Stuka squadron 76, under the command of Haupt-

orders to his pilots. The objective was concealed under a cloud bank approximately 3,000 feet thick, beneath which the planes would have another 3,000 feet in which to identify their targets, aim and release their bombs, and pull up—a maneuver they had all practiced many times before. When the routine briefing was concluded, the aircrews saluted smartly and ran to their aircraft. Within minutes, the group of Ju-87B Stukas was airborne, in formation, and racing toward the target area.

Flying in at 12,000 feet, the Stukas approached their objective. At a few minutes past 6:00 a.m., Hauptmann Sigel gave the order to assume attack formation. He himself led the first group of three bombers. On the left was his adjutant Oberleutnant Eppen, and on the right his technical officer Oberleutnant Müller. After them



Here, Germans service a Ju-87 during the early days of the war. Despite its shortcomings, the Stuka was able to plunge toward its earthbound targets at speeds often in excess of 350 mph. (Photo courtesy of the United States Air Force Museum)

Sudetenland crisis of 1938 caused the Luftwaffe to form additional dive-bomber groups, using older aircraft until more Ju-87s became available. These included the He-45, He-50, He-51, and especially the Hs-123, a plane that closely resembled the Curtiss Hawk and one that was used extensively by the Germans in the initial stages of the war.

Junkers factories increased their production, and soon, faster, more updated Ju-87Bs began to replace

mann Walter Sigel, was preparing for a practice dive-bombing run over the military training area at Neuhammer, only a few minutes' flying time away. Cement practice bombs fitted with smoke charges would be dropped on clearly outlined ground targets, a demonstration that was to be observed by a team of high-ranking Luftwaffe officers.

The latest early-morning weather bulletin from the target area was received, and Sigel issued final attack

followed the other planes, arranged in three groups.

Sigel dived, allowing his plane's nose simply to drop toward the target beneath the thick cloudbank. He immediately went from bright morning sunlight into a milky-white, frothy haze. Plunging earthward, both pilot and gunner strained their eyes to make out the outlines of the targets on the ground directly beneath the clouds. Forehead bathed in sweat, Sigel silently counted off the seconds. The next

instant would surely bring them through the haze.

Suddenly the cloudy whiteness before the Stuka's windscreen darkened into the green-brown of the earth. Instead of the 3,000 feet of clear sky he was expecting, he emerged from the clouds only a few hundred feet from destruction, his entire formation just seconds behind him!



This Ju-87 Stuka crew took part in the German retreat from Czechoslovakia in order to avoid onrushing Russian forces as the war ground toward its end. These men surrendered to a US Ninth Air Force tactical reconnaissance group. (USAF photo)

He instinctively wrenched the control stick backward with all his might and screamed into his microphone: "Pull up, pull up, ground fog, ground fog!"

Literally feet above the ground, Sigel's Stuka sliced through a small clearing between two stands of pines. He managed to pull out, looking hurriedly behind him. On his left, Eppen's Stuka crashed into the trees. Müller, on the right, plunged into the earth in a ball of flame and smoke.

All nine Stukas of the second group, led by Oberleutnant Goldmann, rammed into the ground. Some planes of the third chain managed to hear their commander's warning in time; the others either smashed into the ground or overestimated their pullout loops and crashed upside down into the forest. The last group heard the warning and reacted in time. All of them were able to save themselves.

As the surviving aircraft attempted to reground above the cloud

layer, numbed by what had just taken place, ominous pillars of dark smoke filtered up from below.

Adding Up the Cost

In one fateful blow, the Luftwaffe had lost twenty-six young flyers in thirteen aircraft. Perhaps ironically, Generalleutnant Wolfram von Richthofen was one of the eyewitnesses to the tragedy. Receiving

word of the Neuhammer catastrophe, Hitler reportedly stared silently out of his study window for ten minutes. Could the superstitious Führer have been contemplating calling off his invasion plans because of the scale of the tragedy? Would all Stukas be grounded and their roles in the forthcoming Blitzkrieg be canceled?

That afternoon, a tribunal assembled to investigate the disaster. Its verdict: The ground fog must have developed between when the initial weather report was received and when the dive-bombing attack took place. The mission commander, Hauptmann Sigel, had done everything possible to warn his men after recognizing the danger. No charges were pressed. If Hitler

voiced any opinions about what had happened, they remain unrecorded.

Stuka squadron 76 was quickly brought up to its full complement with spare aircraft borrowed from other groups and played a major role in the initial attacks on Poland beginning on September 1. Its planes bombed bunkers, major highways, trains, troop concentrations, and bridges. The catastrophe at Neuhammer was quickly forgotten in the tumult of war.

The Ju-87 Stuka started World War II as an integral part of the new German Blitzkrieg. As armored units rapidly advanced on enemy troops and defensive works, Stukas dropped bombs, often with a high degree of accuracy, on specific targets identified by tank commanders on the ground. These well-coordinated attacks had devastating results in Poland and especially in the initial assaults on the Low Countries and France the following spring.

Yet the plane's shortcomings, as correctly foreseen by Richthofen, rapidly became evident during the Battle of Britain, when Stuka losses to Spitfire and Hurricane fighters rose to such an extent that Göring had to restrict their use to night-bombing missions only.

In other theaters of action, the plane was used extensively with moderate success, despite mounting losses to faster Allied fighters. Armed with its bomb (which was released by a swinging mechanism from beneath the fuselage to avoid shearing off the propeller) and fitted with high-pitched sirens (which the Germans called "Jericho trumpets"), the Stuka was a target only the most steel-nerved anti-aircraft gunner could continue to hold in his sights.

In the Mediterranean, the plane was used effectively against British shipping, and in Russia, fitted with two 37-mm high-velocity cannon, it became a formidable antitank weapon. A total of 4,881 Ju-87 Stukas was produced during the six-year period of the war. None remains in flyable condition today. ■

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