

# MONOGRAM

## Close-Up 12



**HORTEN 229**



# HORTEN 229

By David Myhra

The story of the Horten Ho 9 begins more than three years before the project was started, in the summer of 1940 when Walter Horten was flying a Messerschmitt Me 109 in the Battle of Britain. It was out over the English Channel day after day that Walter began to suspect that the Me 109 he flew, as Technical Officer in Major Adolf Galland's JG 26, was inferior in performance and maneuverability to the British Spitfires he was trying to shoot down. Although he succeeded in destroying seven British aircraft (1 Defiant, 3 Hurricanes, and 3 Spit-

fires) before he, along with all Technical Officers in Luftwaffe fighter squadrons, was ordered not to fly combat sorties, his suspicion was confirmed later when in August 1940 he became the first German airman to fly a captured Spitfire. Walter realized that a better flying machine would have to be delivered to the Luftwaffe—and soon—if Germany was to have any hope of ruling the skies over England as it had done in Spain, Poland, and France.

Walter Horten and his brothers Reimar and Wolfram had been designing, building, and flying all-wing gliders and motor sailplanes since they were teenagers in the early 1930s. They had gained their experience at the Wasserkuppe, a sailplane soaring site about 100 km (62 miles) northeast of Frankfurt, where many Germans learned to fly after World War I (but only in sailplanes, because the Treaty of Versailles prohibited any other type of powered flight). At the Wasserkuppe sailplane events were held each summer. Prizes were awarded to the pilots who could stay aloft the long-

est, soar the highest, and cover the greatest distance during a single flight. There were special events for children including scale model glider competitions similar to the adult events. Reimar and Walter Horten won the scale model competition three years in a row (1931, 1932, and 1933) with their all-wing gliders. They had found through much experimentation that an all-wing design would fly farther and straighter than models that had a standard fuselage and tail.

By the spring of 1936 all three brothers

had been called into military service with the new German *Wehrmacht*. Walter had entered officers candidate school in April 1934, temporarily serving in the army until transferring to the new German *Luftwaffe* in August 1935. With the establishment of the *Luftwaffe*, Walter trained as a bomber pilot, then a fighter pilot and seeing combat with the 1st group of JG 26, the "Schlageter Squadron," in the

*Above: The first flight of the Ho 9 V1 occurred on February 28, 1944. In this photo, test pilot Heinz Schiedauer is seen on final approach.*

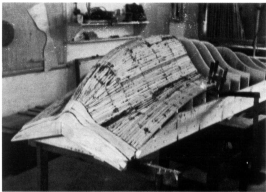


Battle of Britain. Wolfram entered the Luftwaffe and served as a sea-plane-torpedo pilot. He would later die out of Boulogne, France, May 1940, when his Heinkel He 111 exploded suddenly at night while dropping sea mines into Boulogne Harbor.

Reimar entered the Luftwaffe, too, and was assigned duties as a flight instructor at Köln. This was fortunate for him because his commander Oskar Dinort was an avid glider pilot who had followed eagerly the Horten brother's pioneering efforts at the Wasserkuppe/Rhon. Wishing to have an Ho 2 all-wing sailplane for his own use, he asked Reimar if he'd build one if he provided Reimar with work space, material, and labor. Reimar welcomed the opportunity to get back to working on all-wing designs and agreed to the arrangement. Once the first Horten all-wing was under construction, other officers wanted one, too; and before long the flight training command at Köln had enough Ho 2s to be entered

into flying competition at the Wasserkuppe. (They never performed well in the competition, mainly due to the lack of pilot training.) Between 1936 and 1938, Reimar and Walter were able to design and construct several Ho 2s and Ho 3s, an Ho 4, and a twin-engine motor all-wing aircraft, the Ho 5. So busy was Reimar building all-wing sailplanes for the base commander and other officers that he did nothing but work full time at that task. Walter was now a fully trained fighter pilot and technical officer of the Luftwaffe fighter group I./JG 26 and was also able to help in the work.

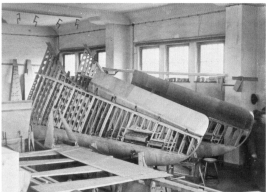
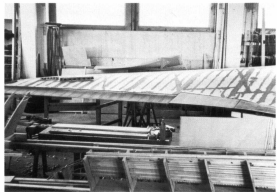
With Germany's invasion of Poland in September 1939, Reimar Horten, like most other inactive reservists, was called up for active duty. He returned to his earlier duties as a flight instructor. In the meantime Walter had been assigned as Technical Officer to Major Adolf Galland's JG 26 fighter wing. He had seen considerable action in France, and then became involved in the Battle of



*Above left: The Ho 9 V1's outer wings have now been attached to the center section and workers are covering this section and the pointed trailing edge of the center section with thin plywood. Above: The wooden framework used to mold the Ho 9 V1's plexiglass canopy.*

Britain. As that air battle raged on through the summer of 1940, Walter became increasingly angered and frustrated. He was seeing his pilots losing their lives in air combat with the British, and he began to suspect that the Luftwaffe's losses would continue indefinitely until it ran out of pilots. Germany's Me 109's were simply no match for the British Spitfires. . . . piloting a Spitfire found intact at a French airstrip had convinced him of that. Adolf Galland, too, came to realize that the Me 109 was no match for the Spitfire. When Deputy-

*Below left: Another view of the drag rudders on the port wing of the Ho 9 V1, now fully extended. Below: Both of the Ho 9 V1's outer wings are nearly completed as shown in this picture. They lack only their plywood covering.*





Führer Hermann Göring visited the Luftwaffe pilots in France one day in the summer of 1940. Walter was there when Göring asked Galland what he needed in order to win the air battle over the English Channel. Galland looked over at Walter, and then, looking directly at Deputy-Führer Göring, replied "Give me Spitfires!" "Well, if you think that they're that damned good," Göring shot back, "why don't you just fly over and capture them then?"

Walter Horten finally came to the conclusion that the only aircraft that could beat the Spitfire was one designed in the form of an all-wing, and he vowed that one day he and his brother would find a way to build an all-wing fighter. He knew that as long as he was stationed with the JG 26 fighter wing he'd be unable to work on a prototype all-wing fighter he was thinking about. But how to break away? Just when he thought he'd be locked in to JG 26 for a long, long time, he got a telephone call from his former wing commander, now general, Kurt von Doering. "Walter, come to me," von Doering said. "I need a man like you with me here in Berlin to help me in the Inspection of Fighters Command as my Technical Referent." It might have been a tough decision for Walter, for the very same day he had been offered the command of a fighter squadron that had just lost its leader—but in fact he had already made up his mind. He was thinking that if he joined the Inspection of Fighters, then with von Doering's and maybe Ernest Udet's influence he might be able to get together with Reimar to build an all-wing fighter aircraft prototype.

Walter Horten's transfer order arrived on

Adolf Galland's desk in May of 1941. "You are making a big mistake in taking a desk job," Galland told Walter, "but if this is what you want, then I'll approve it." "What do you think you can possibly get accomplished in Berlin?" he asked. "Tallman, ('Tallman' was Galland's nickname for Walter Horten because he was 6'2" tall, far taller than anyone else in JG 26.) you belong here with us. You know that and I know it, too." "I may be able to make arrangements for Reimar and me to construct an all-wing fighter prototype," Walter responded. "Walter," said Galland shaking his head, "that old idea of yours is about as crazy as your technique of firing upon enemy planes that cross your bow 500 to 1,000 meters out in front of you." "Ah c'mon Adolf," Walter shot back, "I hit those seven planes at 1,000 meters because I fired on them just as you do when you shoot at ducks or geese in flight. I tell you it works, and every pilot in the Luftwaffe should be taught how to do it," Walter continued. "Are you kidding," Galland asked in jest, "we'd run out of ammunition without even scoring one kill. . . . no way. I want all my pilots to get behind their enemy, and then and only then fire at them from a distance of 100 meters, certainly no more than 200 meters."

Walter Horten had hoped to be able to help his brother Reimar continue working on his all-wing designs once he got to the Inspection of Fighters. He succeeded beyond his wildest dreams. As a senior officer in the Technical Office of the Inspection of Fighters, it was Walter's job to see that the aircraft coming out of Germany's aviation industry was at least as good as the aircraft being produced by the enemy. He had to look at the fly-

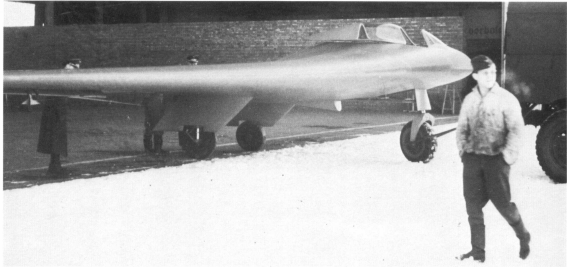
*Above in these photographs, the Ho 9 V1 has been rolled out of its workshop for the first time, on February 27, 1944. Everything on the center section is complete except for the final covering of the rear portion of the cockpit canopy. When this task was finished the center was towed by truck to a hangar at Göttingen, where the outer wings were attached and the entire aircraft was made ready for its first flight on February 28, 1944.*

ability, serviceability, and operational use of new Luftwaffe fighters, to ensure that Germany could effectively challenge the enemy in the years to come.

While working in the Inspection of Fighters, Walter Horten also learned about new top-secret aircraft research. He was constantly briefed about turbojet engine development at BMW (Bayernische Motorenwerke) and at Junkers as well as the work on liquid-fuel rockets being carried out by Hellmuth Walter at Kiel. Not only did he obtain reports on the secret turbojet engine development work, but he also was able to visit the workshops of BMW and Junkers to see for himself and talk to the engineers about the amount of power (thrust) these new engines were capable of delivering. He saw the plans for Messerschmitt's turbojet-powered fighter, the Me 262. He was told about the Walter liquid-fueled rocket engine that was about to be placed in the tailless aircraft prototype under construction at DFS (Deutsches Forschungsinstitut für Segelflug of German Gliding Research Institute) by the Hortens' rival, Alexander Lippisch.

For Walter Horten, the discovery that a new, powerful aeroengine was about ready for aircraft use meant that there now was available a propulsion system



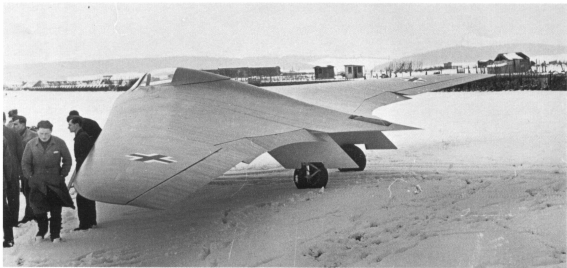


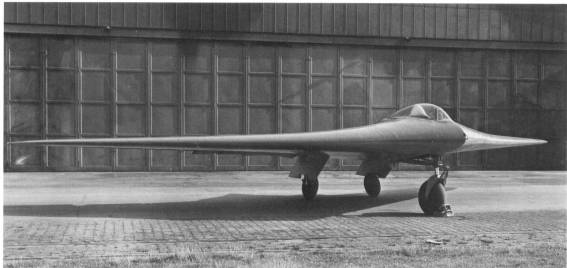
that could turn his all-wing fighter into one of the fastest flying machines in the world. His next thought was to get Reimar away from his flight instruction duties at Köln and the Königsburg Air Base. For a long time Reimar had worked freely on his all-wing research under the protection of his base commander Oskar Dinort. This man had been transferred in 1941 and a new commander had taken his place. Not particularly interested in sailplanes, and especially not by the fact that such an

operation was being carried out at a *Luftwaffe* Transport-Glider-Training command, the new commander *Major* Reeps allowed it to continue at a limited pace—but only after Reimar and several of his sailplane colleagues got *Major* Reeps drunk one evening at the officers club. Reimar was free again to work on his sailplane activities but he was certain that this arrangement at the flight-training command could not last very much longer. After Colonel General Ernst Udet's suicide in November 1941, Wal-

ter Horten managed to relieve Reimar of his flight instruction duties and placed him in a top-secret Inspection of Fighters special command, which he called *Sonder-Kommando* unit 3 in honor of Reimar's work on the Ho 3 sailplane. The *Luftwaffe* was never really aware of *Sonder-Kommando* 3's existence, let

*Above and below: On a cold February 28, 1944, the Ho 9 V1 was rolled out for its first flight as these photographs illustrate. Only the nose wheel gear covers have not been mounted for this occasion.*





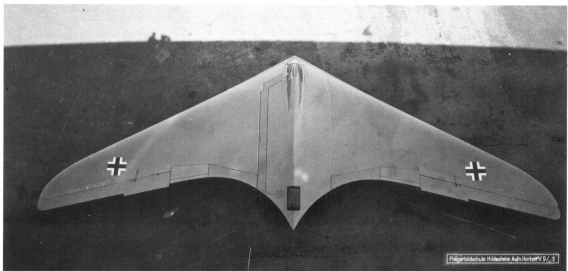
alone its purpose. Later, Walter and Reimar would use this unknown unlisted, and unauthorized special command, which was located at the *Luftwaffe* air station at Göttingen, to build the Ho 9. For the time being anyway, Reimar and his handful of carpenters, machinists, and laborers were protected by Walter in his capacity in the Inspection of Fighters. To keep anyone from finding out about the actual nature of *Sonder-Kommando* unit 3's work, Walter had seen to it that the entire operation was

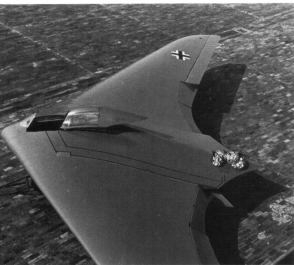
classified top-secret. Had the *Luftwaffe* found out what Walter and Reimar were doing on its time and money, the brothers would have been court-martialed, and perhaps even executed. Thus the pressure on Walter must have been tremendous. Had it not been for his willingness to take these risks on behalf of his brother, in all likelihood Horten all-wing aircraft development would have ceased in late 1941 with the transfer of Major Reeps at the Königsberg/Neuhausen Air Base. But for now, and as

long as the *Luftwaffe* didn't find out, Reimar was free to experiment with his all-wing designs. He was officially in the *Luftwaffe*'s Inspection of Fighters command, but he had no *Luftwaffe* or military duties whatsoever.

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*Above and below: The Ho 9 V1, W.Nr. 38, outside the workshop at Göttingen about March 1944. Note the addition of torque scissors to the nose wheel leg. The brake parachute is shown exposed in the photo below.*





Above: The Ho 9 V1 following a flight. Note the brake parachute loosely wrapped and resting in its compartment at the tip of the center section.



Above: A member of the Horten ground crew tries out a pressure suit developed by the brothers, which was never used in flight. Left: Cockpit interior of the Ho 9 V1. From left to right are fine and course altimeter, turn and bank indicator, vertical speed indicator and airspeed indicator. A compass is mounted below the center. Below: Close-up of the nose gear without covers. Just visible, next to the venturi tube, is the panel which was to be transparent allowing the pilot to visually check the runway distance while landing.



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One day in August of 1941 the telephone rang in Reimar's workshop. "Hello, Reimar?" the caller said. "This is Walter. Tomorrow I want you to lay down all your drafting tools and meet me at the Göttingen airstrip at lunch time. Be prompt, for when I touch down I want you to climb right in and we'll takeoff immediately." Walter frequently came to Göttingen to pick up Reimar, and then the two of them would fly off in Walter's Bf 108 *Taifun* to inspect new aircraft or to talk with engineers about new developments, especially turbojet engines. On this particular day, Walter did not tell his brother where they were going. He wanted to keep it a surprise. In fact, Walter was taking them to Peenemünde to witness the first test flight of Alexander Lippisch's DFS 194 liquid-fueled rocket plane with test pilot Heini Dittmar at the controls. Several days after the amazing flight of the DFS 194, the Air Ministry would order it into production as the Messerschmitt Me 163.

Although Walter Horten had known

about the top-secret DFS 194, Reimar had not, and Walter wanted his brother to see just what Lippisch was working on. Reimar recalls that after Dittmar had made two demonstration flights in the rocket-propelled aircraft, he and Walter walked over to inspect the prototype. To Reimar's astonishment, he found that this aircraft which had just flown nearly 1,000 km/h (621 mph) had plywood-covered wings just like his own sailplanes!

During their return flight to Göttingen, Walter and Reimar talked about this history-making event they had witnessed that afternoon. Walter was caught up with the aircraft's tremendous speed and what it would mean to the *Luftwaffe* to have a fighter aircraft with such unbelievable performance. For Reimar it meant that Lippisch was further ahead than he had thought, well on his way to exceeding the speed of sound. This bothered Reimar considerably. He could not let Lippisch's tailless design become the first aircraft in the world to break the sound barrier. Now Reimar was as eager

as Walter to build a 1,000 km/h aircraft. Although their motivations were different, Walter looked forward to having a better operational aircraft for hitting the Allies fighters and bombers; while Reimar wanted more than anything else to beat Lippisch to the speed of sound.

On their way back to Göttingen from Peenemünde, the brothers decided that the Walter liquid-fuel rocket engine would be of limited endurance, operationally dangerous, and just plain unsuitable for their proposed 1,000 km/h fighter. Besides, the Hortens did not want merely to duplicate what Lippisch had achieved. Instead, the brothers would use one of the top-secret turbojet engines under development by BMW and Junkers. It would be Walter's job to obtain the turbojets. (They had decided the fighter would be a twin engine model, primarily in order to achieve the performance characteristics desired, but also to provide an extra measure of safety should one of the new, unproven

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Initially the nonpowered Ho 9 V1 suffered from a weakness in its nose gear. It would frequently collapse upon landing, and the nose would rub the runway until the glider came to a halt. In these two photographs, the Ho 9 V1 is pictured with its nose wheel collapsed on a snow covered runway.



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engines malfunction during flight.) Reimar's job would be to come up with a suitable design for the aircraft. For Reimar, his assignment appeared much more difficult than Walter's, for he knew almost nothing about turbojet engines—their physical dimensions, the amount of power they produced, their weight, fuel usage, and so on. An all-wing aircraft owed its efficiency to the streamlining effect of the wing itself and the lack of obstructions. Could these turbojets be enclosed in the wing itself, or would they have to be placed outside the wing? Hanging two 60-cm (27.1 inches) turbojets under a wing would create a substantial amount of wind resistance and drag. Could an aircraft so designed ever reach 1,000 km/h? Reimar didn't know.

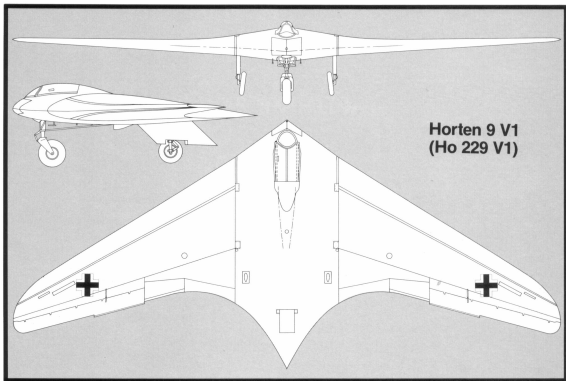
A few weeks after the Horten brothers' trip to Peenemünde, Walter was able to obtain an engineering report on the BMW 003 turbojet engine. He copied all the pages, and when he came to the power curve chart, he held it up to a lamp

and traced the curves. Now, Reimar had at least some information about the BMW 003's power curve and could begin calculating the size of an aircraft he could hope to fly powered entirely by turbojet propulsion. Walter had also obtained a copy of the engine's performance characteristics. But he still had to obtain two fresh, flight-ready engines.

When Walter had first joined the Inspection of Fighters he had made the acquaintance of Dr. Hermann Oestrich, BMW's director of turbojet engine research and development. Walter now told Oestrich that the *Luftwaffe* had ordered the Hortens to build a turbojet-powered all-wing fighter aircraft and that the engines were to come from BMW. A directive would soon be sent to Oestrich confirming this matter. Oestrich was ready to comply with no questions asked. However, before he could deliver the engines, BMW's work on the turbojet engine 003 was postponed while the company devoted all its resources to a priority request for a large number of

piston engines from Albert Speer, Minister of War Production. Oestrich was unable to give the Hortens a firm date when they could expect delivery of the BMW 003s. In the meantime, Oestrich shipped the brothers two empty BMW 003 engine shells. What they had, in essence, were two pipes 60-cm in diameter—no turbines inside them, and no accessories such as pumps, pipes, tubes, hoses, or other items engines need in order to operate. Oestrich assured them that completed, ready-to-run engines would come later. For now, the brothers could design their aircraft around these two shells and use them as mockups for the real thing.

The Hortens had discovered that in Nazi-dominated Germany few individuals questioned official orders. Walter learned quickly that all he had to do to get men, material, equipment, and even work space was to send off a telegram (top-secret, of course) ordering, for example, a *Luftwaffe* supply depot to provide materials and supplies to *Sonder-*



**Horten 9 V1  
(Ho 229 V1)**

**Kommando 3.** The *Luftwaffe* had many such *Sonder Kommando* units, so Walter's "made-up" organization did not attract undue attention. When one senior *Luftwaffe* officer questioned the nature of this *Sonder Kommando 3*, Walter stamped all correspondence relating to it "By the General of the Fighters" and used the opportunity to rename it *Sonder Kommando 9*, this time in honor of the Ho 9 being built there. With the name change, Reimar was again safe to pursue his private research, to fulfill the task of developing a superior fighter aircraft despite the fact that Germany was engaged in a life or death struggle. Obtaining two turbojets presented no problems either. Walter merely sent off a telegram authorizing Dr. Hermann Oestrich to ship the new BMW 003s to the *Sonder Kommando 9* at Göttingen. He also saw to it that payment for all their supplies, even for such large and expensive items such as two turbojet engines, were made out of secret inspection of Fighter's development accounts. Consequently, the Hortens were able to avoid detection by *Luftwaffe* auditors throughout the war.

With the assurance that two BMW 003 turbojet engines would eventually be delivered, Walter and Reimar decided to build their Ho 9 around the shells as Dr. Oestrich had suggested. Reimar wanted to construct two airframes for the proposed fighter. The Ho 9 V1 would be

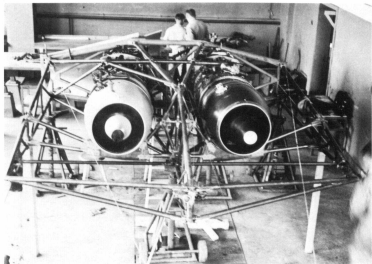
a full-sized, nonpowered glider. The second version, the Ho 9 V2 would be the powered prototype. In the absence of wind tunnels (this was one area in which Walter had absolutely no influence, because all wind tunnels throughout Germany were controlled by the Civil Air Ministry), Reimar would finish the non-powered glider first in order to test its aerodynamics and flight characteristics prior to the completion and first flight of the Ho 9 V2.

Reimar originally had hoped to avoid building the nonpowered glider model of the Ho 9 because of all the work it would entail. His first thought had been to modify the Ho 7, placing a single BMW 003 turbojet under the wing and between the two main rear landing wheels and making it a flying test bed. Eventually he concluded that the Ho 7 was not strong enough to fly safely at the greater speed made possible by the turbojet. In addition, the placement of the engine so close to the ground might cause problems; during takeoff, rocks and dirt could be sucked into the air intake, causing severe damage to the turbines. So in June 1942, Reimar decided to forget about modifying his Ho 7 as a turbojet-powered test bed.

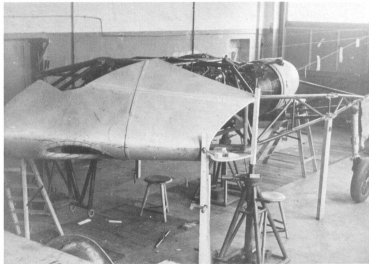
All through the summer, fall, and winter of 1942, Reimar's workshop at Göttingen was busy with construction of the two Ho 9s. The Ho 9 V1 was nearing

completion by early 1943. The Ho 9 V2 was also taking shape. The center section, which housed the engines, was finished except for its plywood covering. The two outer wings were also finished, and Reimar was waiting to hear from Oestrich at BMW about a delivery date for the turbojets. In the meantime, other good things were happening to the Hortens. They had been wondering just how they were going to present their Ho 9 V1 and V2 to the Air Ministry as a proposed fighter. Then a stroke of good fortune . . . in early 1943, Walter was present at a meeting at which Deputy *Führer* Hermann Göring flew into a rage over all the duplication of fighter bombers being produced in Germany. Nearly all the major aircraft manufacturers—Junkers, Messerschmitt, Heinkel, Dornier—he said, were producing the same type of twin engine aircraft. He'd accept no more such nonsense in the future. What he wanted was an aircraft capable of carrying a 1,000 kg bomb at 1,000 km/h up to 1,000 km distance (hence the term "3x1000 fighter/bomber"). So eager was Göring for this type of aircraft that he was offering 500,000 RM to the first aviation company to submit a design proposal providing him with an honest-to-goodness 3x1000 fighter/bomber.

Walter told Reimar immediately about the Deputy *Führer's* demand, and they agreed that the time was ripe for submission of a proposal on their Ho 9. Reimar was ready, for he had previously written a 20-page proposal describing the performance and flight characteristics of a proposed turbojet-powered fighter/bomber called the Horten Ho 9. In Reimar's proposal were detailed drawings of the aircraft, artist's renderings of the aircraft in flight, specifications on its anticipated performance, and numerous tables and charts. They were careful not to include photographs of the two Ho 9 prototypes under construction, however, because this aircraft was not supposed to exist! Within days of Göring's demand for a 3x1000 fighter/bomber, the Hortens sent the Ho 9 proposal to General Dörsing, Göring's chief of staff. Dörsing passed copies around the Air Ministry for review and even sent copies to reviewers



Left: In this photograph both BMW engine shells have been installed in the Ho 9 V2 for perspective during construction. The plan was to remove them when the two factory-fresh BMW 003s finally arrived.



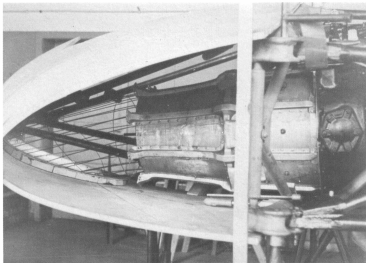
Left and below: The twin BMW 003s might have fit smoothly inside the wing of the initial Ho 9 V2, as can be seen in this side view of the center section. Initially the Ho 9 V2's air intake was designed as an oval with the opening on the underside of the leading edge as shown in this photograph.

He continued to show amazement at the all-wing design and asked questions about the proposed fighter/bomber. How well would it fly compared with existing *Luftwaffe* fighters with standard tails? How would the Hortens construct the prototype? "Out of wood?" he asked, surprised. "But how?" Where had these brothers learned all these techniques, he wanted to know. "At the *Wasserkuppe* was the Hortens reply. Göring kept saying, "I didn't know any of this!"

Göring, the Hortens learned, had never been to the *Wasserkuppe*. He was of the

at DFS. Although the Hortens promised a 3x1000 aircraft, Dising was not going to show the proposal to Göring until he had received favorable comments from his reviewers. He just didn't want to risk angering Göring, should he find any obvious faults with the design that he might have overlooked. All in all, the review process took about six months. From time to time, Walter would call Dising's office and inquire about the status of the proposal. "We are reviewing it" is all he would be told.

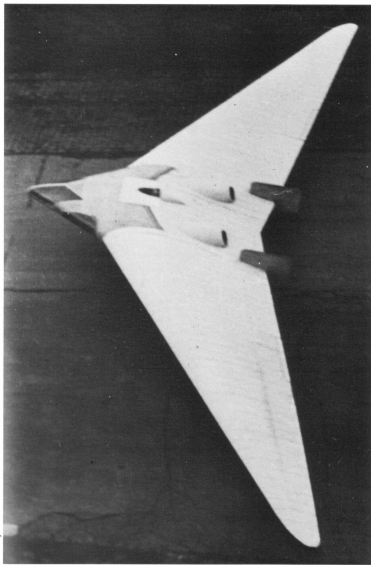
Finally, in August 1943, Walter Horten received a telephone call from General Dising's office. The Air Ministry had found the design proposal to be very interesting, and Deputy *Führer* Göring would like to meet with the Horten brothers to talk further about their all-wing design. During their meeting, which was held at Göring's *Karenhall* residence, Göring was full of questions. He marveled at the brothers' youth (Reimar was 28 and Walter was 30) and wanted to know how these two young men had obtained all their experience and knowledge in aircraft design. The brothers replied that they had entered their aircraft designs in competition at the *Wasserkuppe* each year starting in the early 1930s. Göring confessed that he had never been to the *Wasserkuppe* and had never piloted a sailplane. "You fly these all-wing sailplanes lying on your stomach?" he asked in surprise. "How



can this be?" Walter got up from his chair and kneeling down on the floor used a chair to show the Deputy *Führer* the prone flying position used while piloting most of the Horten sailplanes. It must have been quite a sight . . . a captain in the *Luftwaffe* demonstrating the prone flying position to the second most powerful man in the Third *Reich* and the General of the entire German *Luftwaffe*! The brothers recall that it was like a talk between a father and his son.

type of World War I pilots who were interested only in powered aircraft, and not in soaring or in sailplanes. He had never had to be involved with nonpowered flight because he had learned to fly with a motor, whereas young men and women interested in flying after the World War I armistice could learn only by piloting nonpowered gliders and sailplanes. Reimar told Göring that their turbojet-powered fighter/bomber design was based on all their experience at the





Wasserkuppe. "Well, how well will it perform?" Göring asked. Reimar told Göring about the aircraft's anticipated handling characteristics, wing loading, range, fuel consumption, bomb load capabilities, cruising speed, landing speed, and so on. Then Göring stood up and said, "Do it. Make this aircraft and let me see it fly!" He then turned to Erhard Milch, his senior field marshal and told him to authorize the transfer of 500,000 RM to the Hortens as their prize for the Ho 9

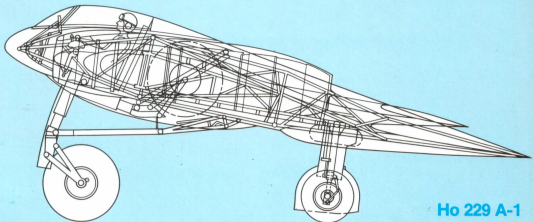
design. Later, when the interview with Göring was over and the brothers were alone with Milch, Milch asked Walter with whom the contract should be made, Captain Horten or whom? Walter paused and then told Milch that he was not sure but that he would return the next day with the answer. Before going back to Milch, the Hortens incorporated, calling their new aviation company the *Horten Flugzeugbau, GmbH*.

When the Hortens switched powerplants for their Ho 9 V2, from BMW 003s to Junkers 004s, they had to modify the aircraft's center section considerably. The Ho 9 V2's nose was made longer and more pointed and the air in-takes for the 004s were cut directly into the center section's leading edges. In order to quickly test the aerodynamic effects of these changes, Reimar modified two Ho 2 sailplanes. On one of the two Ho 2s pictured here, he attached a long pointed nose and added two can-like objects to the top of the center section simulating the rear portions of the two Junkers 004s. Notice the raised cockpit aft of the pointed nose. The two vertical fins behind the exhaust tubes on the center section's trailing edge were not experimental rudders but only objects to direct the air flow over the exhaust ports during testing.

Göring had informed the brothers that he expected to see the first prototype fly within six months. Reimar had replied that that would be impossible. However, he could guarantee to have a nonpowered version, the so-called Ho 9 V1, ready for flight within six months, by February 1944. Luckily for the Hortens, they had already put in about six months of work on both the Ho 9 V1 and V2. On February 28, 1944, the Ho 9 V1 sailplane flew for the first time, with Horten test pilot *Oberleutnant (ObLt.) Heinz Scheidhauer* at the controls. Later, Walter flew the Ho 9 V1 and found it to be very stable, with pleasant flying characteristics. But he also saw that in "pumping air" (turbulence) the Ho 9 V1 would not be a stable gun platform. A good, experienced pilot would be able to hold his aim on target, Walter believed, but it would require much time and skill. He knew that pilots often do not have much time to bring their flying machines into position to shoot down enemy aircraft. He was also concerned about the quality of the pilots remaining in the shutup *Luftwaffe* by mid-1944. Most of them were very young, with little flight experience and even less flight training. It was asking a lot of these young, poorly trained, and inexperienced boys to pilot a very fast turbojet-powered all-wing fighter/bomber. How could they also expect them to keep the aircraft stable while trying to shoot down enemy planes from a distance he hoped would be in the neighborhood of 1,500 to 2,000 meters? As a gun platform the Ho 9 would be good but it could be better with some small modifications.

On the basis of his own test flights, Walter believed the Ho 9 would require a ver-

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Ho 229 A-1



Above: Reimer Horten at age 18 with his Horten 1 at Wasserkuppe in 1934. Right: Obdt. Walter Horten in the summer of 1940 at age 27. He is pictured here carrying out ceremonial duties as the Technical Officer of JG 26 while stationed in France during the Battle of Britain. Left: Horten test pilot Lt. Heinz Schiedhauer. It is interesting to note that Lt. Schiedhauer was able to test fly the unpowered Ho 9 V1, but was unqualified to pilot the twin-engine, 9 ton Ho 9 V2.





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tical fin with a hinged rudder attached to it. Others who had flown the Ho 9 V1 and had read the flight test reports agreed . . . they should place a small vertical fin on the center section mid-line and attach a hinged rudder at its rear. Reimar would have none of this, however, for he believed that the "Dutch Roll," or oscillations, pilots were experiencing in pumping air with the V1 could be dampened out in time for a pilot to aim and shoot effectively. Walter was not so sure. He feared that the Ho 9's side-to-side oscillations might reduce the aircraft's role to that of only a bomber (which wasn't really needed anymore, in early 1945). Moreover, it was possible that the Ho 9 would be abandoned if the "Dutch Roll" could not be corrected, and soon for Gothaer Waggonfabrik AG (Gotha) had presented its own version of an all-wing fighter, the Gotha Go P. 60, which was similar to the Ho 9 but had small vertical fins near the wing tips for directional stability. In any event, Walter felt in March 1944 that the quickest way to correct the

oscillation problem without leaving it up to the pilot was to place a small vertical fin on the Ho 9. Walter was more willing to make such a modification than was Reimar, who continued to believe that with time the problem could be worked out and that no vertical surface at all would be necessary. Nevertheless, Walter did go so far as to construct a full-size mockup of an Ho 9 with a vertical fin for the Air Ministry to inspect. (The design of the Ho 9 was never changed, but it is entirely likely, say the Hortens today, that if the war had continued on through the summer and into the fall of 1945, then one or more of the Ho 229s under production by Gotha in the spring of 1945 would have been flight tested with a vertical fin and a hinged rudder attached to its rear.)

While the Ho 9 V1 was undergoing test flights, work continued on the Ho 9 V2, still without the long-promised turbojet engines. Dr. Oestrich telephoned Walter one day in mid-1943 to say that he and his brother might be better off if they ob-

*Above: For the Ho 9 V2, the front nose gear was again changed and made substantially heavier. Top Right: After the bombing raid on the Horten's Göttingen workshop in May 1944, the Ho 9 V2 was moved to Minden. As can be seen, it occupies nearly an entire three-car garage with its outer wings attached.*

tained their turbojet engines from Dr. Anselm Franz at Junkers. Walter contacted Franz about the availability of two Junkers 004 turbojet engines for a top-secret Inspection of Fighters *Sonder Kommando* unit project. He found Franz to be very cooperative but unable to promise delivery of the turbojets until March 1944. Meanwhile, the two BMW 003 empty engine casings remained in the Ho 9 V2's center section as mockups. Reimar would take them out after the Junkers Jumo 004s had been delivered for he assumed the Jumo 004 turbojets, like piston aeroengines, would be entirely interchangeable and having the similar mounting points, dimensions, power, and weight. However, a major surprise was in store for the Hortens.



Initially, the center section and main wing spar of the Ho 9 V2 had been designed to accept a 60-cm in diameter turbojet engine. Even after they had decided to go with the Junkers 004s, Reimar continued work on the assumption that the engines would be 60-cm in diameter. But they were not. In fact, the Junkers 004s, with all their accessories added, came to 80cm in diameter. An 80cm diameter turbojet engine simply would not fit into the Ho 9 V2's center section.

There was a simple explanation for this mix up. Walter had ordered the engines for *Sonder Kommando 9's* use, and to avoid any problems he had not placed his name on the order. As a result, the Hortens did not receive any information about the turbojets and had not been informed of specification changes as had the other aircraft companies that were waiting for delivery. Owing to the nature of the arrangements Walter had made with Dr. Franz of Junkers, the Hortens were not on the waiting list or on any distribution list to receive information and details about the engine. Franz assumed that the Hortens knew all about the Jumo 004 engine, including its dimension, and Walter and Reimar assumed that the 004s were the same diameter as the BMW 003s. In March 1944, six weeks

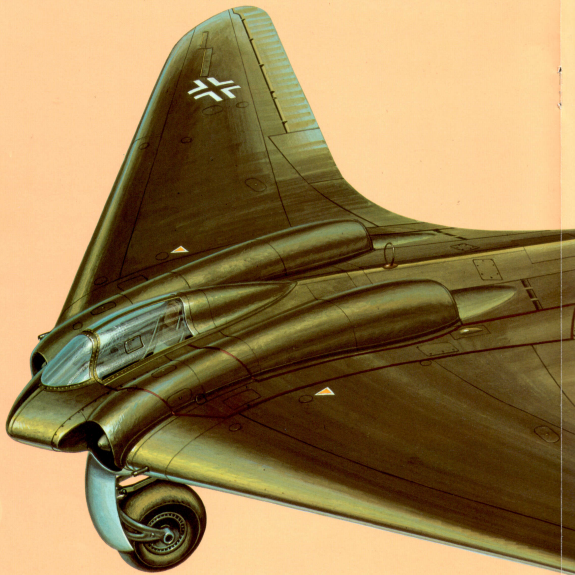
before the Ho 9 V2 was scheduled for its first test flight, Reimar discovered to his horror that the Junkers 004 turbojets would require a wing depth 1/3 thicker than they were actually building! Although the thrust produced by the Jumo 004 was a bit higher (800 kg thrust for the BMW 003 versus 910 kg thrust for the Jumo 004), the Ho 9 V2 would have to be a larger aircraft in order to accommodate the larger Jumo 004 engines—and thus the overall performance of the Ho 9 V2 would be somewhat less than anticipated and less than they had promised to Deputy *Führer* Göring.

Reimar determined that the wingspan of the Ho 9 V2 would have to be increased from 16 meters to 21 meters, with a corresponding increase in wing area from 42m<sup>2</sup> to 75m<sup>2</sup>. But the Ho 9 V2 was nearly completed in the workshop at Göttingen. What should they do now? Reimar decided it was too late to start over with a new center section and new outer wings. It appeared that a quick mending job was in order. First, Reimar concluded that he would leave the outer wings just as they were. Second, he would enlarge the center section wing root depth by 1 meter so that the larger Junkers 004s would fit in. To make the outer wings fit, he would add one addi-

tional wing rib to the center section, thus increasing the root thickness of the center section from 13% to 14.5%. One can say that, aerodynamically, a new aircraft was going to be built and sent to its first test flight without any pretesting in a wind tunnel or as a full-sized non-powered glider model. Nor did the lessons learned from the Ho 9 V1's flight tests apply any more.

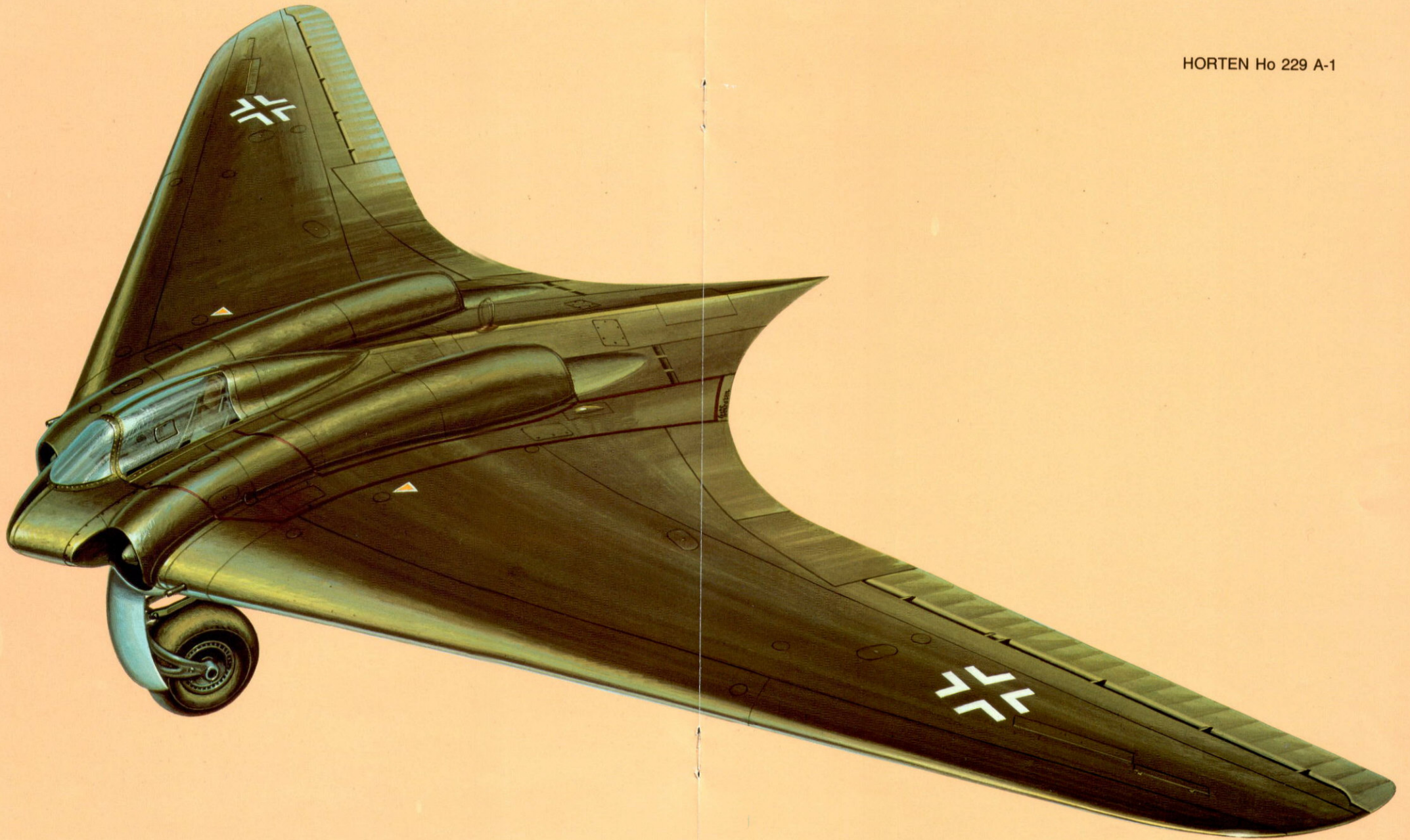
Reimar hoped that the modified Ho 9 V2 would be ready for its first test flight by January 1945. To meet even this deadline, a tremendous amount of work would have to be done. Reimar asked Walter for thirty additional men in order to get the job under way. He wanted the best carpenters, welders, engineers, and technicians that were still around in March 1944. With the Horten staff now working up to 90 hours a week, the Ho 9 V2's center section was torn down and stripped, and a new, larger center section made of steel tube was welded up. The two Jumo 004s, which had already been delivered, were placed in the new center section and everything else from the old Ho 9 V2's center section was tried on for size. Where things fit they were attached. If modifications were necessary,

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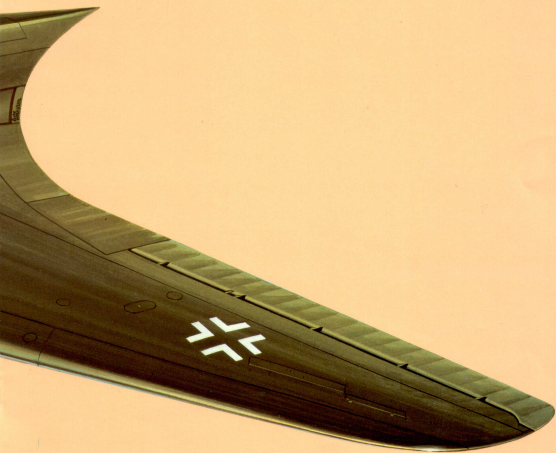


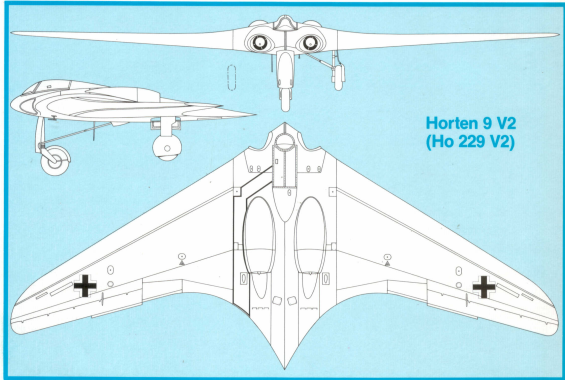


HORTEN Ho 229 A-1



HORTEN Ho 229 A-1





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they were made immediately and the parts were attached. New parts were crafted only when items from the old Ho 9 V2 would not fit and could not easily be made to fit. Because of the absolute necessity of making the aircraft ready to fly by January 1945, it was not really possible to test the aerodynamic effects of all the changes. And there were major changes. For example, the air intakes of the new Ho 9 V2's were placed directly into the leading edge. Also, the huge Junkers 004s protruded above the entire chord (length) of the upper center section's surface, whereas only the last third of the BMW 003s had protruded. Reimar didn't know what effect these two engine bubbles as well as the modified air intakes might have on wing lift and air flow.

An additional, uncontrollable problem shook the brothers' confidence and led to about one week's delay in May 1944. One morning the Göttingen workshop crew heard the air-raid siren. Without hesitation, Reimar and Walter told their

*Dapper and always smiling, Lt. Erwin Ziller had flown the Me 262 and, after his first test flight in the Ho 9 V2, said the Horten all-wing would outperform the twin-engine Messerschmitt. Opposite: With the adoption of the Junkers 004, air intake streamlining was impossible, so the Hortens were forced to break the clean lines of the all-wing design with two large holes for direct access to the av.*





workers to get out of the building and to take cover in the bomb shelter outside. Instead of going to the shelter, too, Reimar and Walter ran in the direction of the *Autobahn* and into a huge drainage pipe. Here they would be protected but could still observe the bombers flying overhead. As they watched, two groups of American made Martin B-26 twin-engine "Marauder" medium tactical bombers, when they were about 3 km (9,800 ft) away, started dropping their bomb load. Walter counted 18 bombers in all, and they appeared to be dropping their entire load on Hortens' workshop! But wait. Even though there were heavy explosions, with dirt and dust flying all over, the workshop had not been hit! The whole open field for about 800 meters (2,600 ft) beyond the workshop looked as if it had been plowed with huge farm tractors . . . but the bombers had dropped their bombs too late, and they had fallen behind the workshop. The brothers did not know whether their workshop had been the primary or secondary target, but they were taking no chances. That very day they began moving the Ho 9 V2, indeed the entire workshop, to Minden. If the Americans made

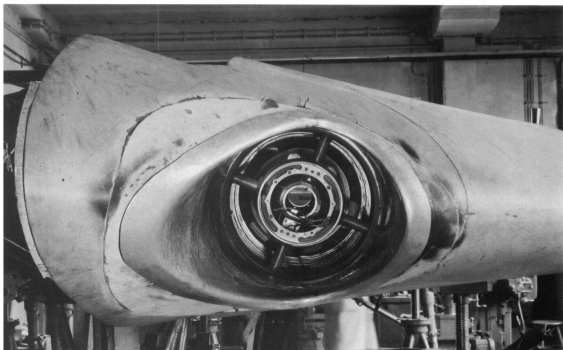
a reconnaissance flight over Göttingen and the Horten work shop, they would see that their bombs had fallen long, and they might be back. No one could predict what might happen. The best insurance against losing the entire Ho 9 V2 project would be to move it to another location.

The Hortens were aware of the risk to man and machine in rushing an entirely new design into flight testing without prior testing either in a wind tunnel or at least through the flight of a nonpowered glider. There simply would be no time to pretest the new enlarged design before its first flight. However, there would be time for some testing of a modified Ho 2 sailplane.

A number of modifications had been made to the Ho 9 V2 to accommodate the larger Jumo 004s. Initially the air intakes had been placed beneath the wing's leading edge. With the modification, the air intakes were oval and were placed right into the wing's leading edge. Reimar was uncertain of the effect this change would have on the Ho 9 V2's flight performance and stability. Would

the air as it entered the oval intake get into a whirl and perhaps cut down on the efficiency of the turbojet engine? And what would be the effect of the turbojet engine exhaust ducts being placed at the wing's trailing edge? In the initial Ho 9 V2 the engines and the exhaust ducts did not protrude as much as the Junkers 004s engines now did. What effect would this change, and the larger, thicker center section, have on aerodynamics? Reimar wanted to answer these questions . . . even though it wouldn't make much difference if he did and the news was bad, for there was precious little time to change anything at this point.

To obtain at least some data on the aerodynamic effects of the changes, Reimar modified two Horten Ho 2s to resemble in scale the new Ho 9 V2. Air intakes similar to those being fitted on the Ho 9 V2 were built into the Ho 2s, to see what air-flow conditions were present during takeoff and landing. To test the thick wing root and its effect on wing lift distribution, the Ho 2s were further modified so that they began to take on the look of the Ho 9 V2. Woolen tufts were placed on the wings and, with a camera



mounted on a wing tip, series of photographs were taken of the air flow over the center section and over the outer wing. These pretests showed that the modifications made little or no difference to the basic superb aerodynamics of the Ho 9 V2.

By late December 1944 the Ho 9 V2 was ready for its first test flight. It weighed about 9 tons and, just like a 9-ton twin-engine conventional aircraft, it needed a pilot qualified to fly a heavy, high-performance fighter. This meant experience at least with a Messerschmitt Bf 110, a Heinkel He 111, or a Junkers Ju 52. The Hortens' main test pilot, Oblt. Heinz Scheidhauer, had only a license to pilot single-engine aircraft, so although he had flown the nonpowered Ho 9 V1 glider, he was not qualified to pilot the Ho 9 V2. Not wishing to break the law, the Hortens turned to another of their test pilots, *Leutnant* (Lt.) Erwin Ziller. Ziller had the experience of flying heavy, high-performance twin-engine aircraft. He had also flown the Messerschmitt Me

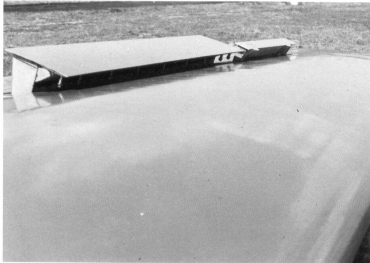
262 turbojet-powered fighter. Scheidhauer, too, had been sent to Richlin to obtain flight experience on the Me 262. However, bad weather and the presence of U.S. Army Air Force fighters prevented Scheidhauer from taking any test flights with the turbojet-powered Messerschmitt. Instead, Scheidhauer was called back to Oranienburg by Reimar to stand beside him in the control tower during Ziller's first test flight.<sup>1</sup> Just prior to Christmas 1944, Ziller, Reimar, Scheidhauer, and the ground crew for the Ho 9 V2 gathered at the Oranienburg airstrip for the aircraft's first test flight. Lt. Ziller had not yet learned to start the turbojet engines himself, so one of the Horten ground crew who had been to the Junkers factory and had learned the technique had to lean into the cockpit after Ziller had been buckled in to help him.

Reimar was in the control tower with Scheidhauer talking to Ziller over the

*Below: When the Ho 9 had to be moved, it was usually moved in sections. In early 1945 the Hortens did not have access to heavy equipment, so they resorted to what they did have... manpower. In this photo Horten employees move the completed outer wings for the Ho 9 V2. Using ropes and a dozen or more men, they carry one outer wing out of the workshop and place it on a small four-wheel trailer. Once it was firmly tied down, it was pulled by a car to Oranienburg to be mated with the center section.*

1 First flight is believed to have been on Dec. 18, 1944.





Left: Both drag rudders are shown fully extended on the Ho 9 V1. There were two sets of drag rudders on each outer wing, as shown in the photograph. One set rose out of the upper wing surface, and the other set extended out of the lower surface during activation. Initially the larger drag rudder in each set extended first, followed by the other when full drag rudder was required during flight.

radio. He wanted to be there to help Ziller along with all the things he had to do, and he didn't want anyone in the control tower who might become nervous should some difficulty arise during this first flight test. Prior to takeoff, Reimar and Ziller talked over the flight program one more time. Both men had been pleased with the condition of the turbojets and the way they had operated during ground tests. The exhaust of both was a deep red, which was normal coloring. Each man was fully ready for the flight. The two Junkers Jumo 004s were started. Reimar asked Ziller if he had set the trim, and Ziller replied that he had. Takeoff went smoothly and as the Ho 9 V2 climbed it trailed twin lines of exhaust smoke as the prototype fighter reached 1,000 meters in altitude. Reimar suggested that Ziller reduce the engine thrust a bit as the Ho 9 V2 continued climbing. Everything went well, and Ziller was pleased with the lightness of the controls and the way the Ho 9 V2 responded. All in all, Ziller flew the Ho 9 V2 for 30 minutes, making turns, curves, and banks. The landing also went smoothly. Before the landing, Reimar requested that Ziller make a low pass over the control tower so he and Scheidhauer could check that the landing gear had extended fully.

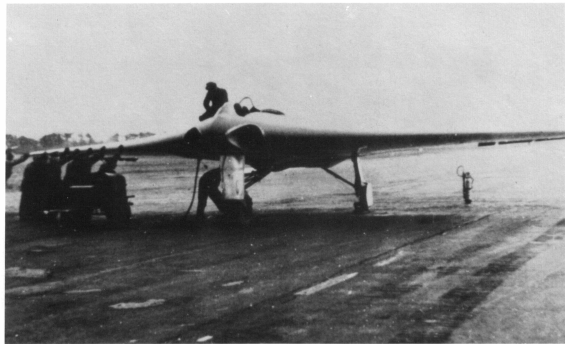
When Ziller taxied up to the hangar, Reimar, Scheidhauer and others were there to check the aircraft. They were particu-

larly interested in how the wood in the center section had held up under the tremendous heat generated during flight by the two turbojet engines. It would be easy enough to detect because the steel frame center section had been painted with a special paint which would change color depending on the degree of heat it was exposed to. At no place in the center section did the temperature ever reach its maximum heat during the test flight. It appeared that the wood covering of the center section would not overheat, but just to be sure, Reimar asked the ground crew to check it thoroughly for at least two more test flights.

Later that afternoon after the test flight Reimar returned to Göttingen in the Ho 7 with Scheidhauer. Christmas was only a few days away and both brothers wanted to be with their parents in Bonn for the holidays. Before leaving in the Ho 7, Reimar gave specific instructions that no one, including Ziller himself, fly the Ho 9 V2 without either Walter or Reimar being there to observe. Since this Ho 9 V2 was their only specimen, they wanted nothing to happen to it. Ziller and the ground crew said that they fully understood, that no one would attempt to fly the aircraft without one or both brothers there to observe all the flight preparations and the test itself. They would come right back after the holidays, Reimar told Ziller and the others, and then the flight tests of the Ho 9 V2 could resume.

The Hortens never did make it back to Oranienburg as they had promised. Nor did they ever see Ziller, their happy, always smiling test pilot, alive again. Other things would keep them away. Earlier that month, Air Ministry Technical Director Colonel Siegfried Knemeyer had arrived at Göttingen in his light observation plane and Walter had taken him up in the Ho 7 for a checkout. Minutes after they had landed, Knemeyer went up again in the Ho 7 by himself. Back on the ground, the colonel commented to Walter that the Ho 7 would make an excellent bomber. "Bomber," Walter whispered to Reimar, "what is he talking about?" Then saying no more, Knemeyer had thanked the Hortens for their hospitality and departed. About two weeks later, just as Reimar was getting ready to fly to Oranienburg with Scheidhauer for the first test flight of the Ho 9 V2, Knemeyer had telephoned the Hortens and asked if they could possibly build an all-wing turbojet-powered bomber capable of carrying a 1,000 kg bomb to the United States and then return without refueling. With the Ho 9 V2 project now nearly finished and production orders given to Gotha and Klemm by the Air Ministry to construct up to 93 of the flying machines, the Hortens were looking for new aircraft design projects to work on. Their reply to Knemeyer had been, "Yes, we can do it." Never asking Knemeyer why the Air Ministry was interested in a long-range bomber at that stage of the war, they had only told Knemeyer that it would take at least ten days to write up a design proposal for his review. "Wonderful," Knemeyer had replied, "I'll expect to see it in ten days."

All during the holidays, Walter and Reimar worked on the design specifications for the so-called "Amerika Bomber." When they did not return to Oranienburg after New Years Day as they had promised, their associates at Oranienburg began calling. "Our people are waiting here for you," the callers said, "so we can get on with the flight testing of the Ho 9 V2." Knemeyer had



instructed the brothers to tell no one of the design project they had been asked to work on. (What they did not learn until after the war was that this design project was to be an aircraft that would carry Adolf Hitler's alleged untested atomic bomb to the United States and drop it on New York City. Known as the Ho 18b, this all-wing aircraft would have been propelled by four Heinkel-Hirth HeS 011 turbojets each having 1,200 kg [2,650 lb] of thrust.) Forbidden to tell anyone what work they were doing, Reimar and Walter had to make up excuses for suddenly ignoring the Ho 9 V2 project. As the days turned into weeks, Reimar finally gave in a little and granted Ziller permission to carry out high-speed taxi runs with the Ho 9 V2. "But do only short hops, and under no circumstances take it up," he warned. During one high-speed run, Ziller apparently began running out of stopping distance as he approached the end of the runway. Seeing that he'd never come to a full stop in time, Ziller elected to put the Ho 9 V2 into the air rather than collide with the barricades at the end of the runway. While in the air, apparently one of the 004 turbojet engines flamed out and Ziller began making preparations for an

emergency landing. What Ziller was thinking about in those last few moments is not known, for no one was in radio contact with him. If he was facing an emergency, he'd had to go it alone for the Hortens were in Göttingen and so was Scheidhauer and there was no one in the control tower or on the ground who could help him. But he was known to be cool in times of difficulty, and he had more flight experience in multi-engine aircraft with the exception of Walter himself. The ground crew watched in wonder as Ziller began circling to make his final approach. But in coming in for the landing the ground crew saw the Ho 9 V2 go into vigorous wing rocking motions while the remaining 004 was accelerated up one moment then throttled nearly back to idle the next. To those on the ground it appeared that Ziller was searching for a safe throttle setting to maintain steady, straight ahead flight but was unable to find it. The Ho 9 V2 would have adequate power from the remaining turbojet to make it down to the landing strip, the ground crew knew, with no trouble at all. The only problem in this minor emergency was the railroad track at the end of the runway. It was distressing though to hear the turbojet-engine

*Horten ground crew pushes the Ho 9 V2, W.Nr. 39, into position on the runway at Oranienburg prior to its first flight in December 1944.*

suddenly speed up then go back to almost an idle. This shouldn't be.

For reasons long forgotten, a railroad track had been placed right in the flight path at the airstrip. It wasn't an ordinary track. Instead, the rails had been placed on top of a 2- to 3-meter-high embankment. Here was a man-made obstacle directly in the flight path at this relatively major airstrip. Still, no one was worried, for Ziller had flown in and out of Oranienburg many times. He knew the railroad track well, the trees lining the edge of the runway, the typical gliding angle, appropriate approach speeds, and altitudes—in short, all the things pilots memorize which later become second nature to them as they carry out their takeoffs and landings. But Ziller did something different during his landing approach that February day. In piloting Horten all-wing aircraft, especially the Ho 9 V1 and V2, Reimar had asked him to keep the landing gear up until virtually over the runway. This was because Reimar wanted



*The first flight of the Ho 9 V2 occurred just before Christmas 1944. In this photograph the ground crew has started the Junkers 004s prior to the aircraft's first test flight. The man lying on the wing worked the controls to get the 004s started. Test pilot Erwin Ziller had not yet learned the procedure.*

to develop a flight characteristics profile on the Ho 9 V2 to determine engine settings during landings, the amount of flap required, the drag needed, and the effect the tricycle landing gear would have on all this. Reimar wanted Ziller to bring the Ho 9 V2 in over the runway's edge at about 4 or 5 meters altitude and then drop the landing gear and flare the all-wing down for a normal landing. This was possible because the landing gear operated through hydraulics, and it was designed to extend fully and lock within

a few seconds after activation.

As Ziller was making his final approach far out from the landing strip, he did something unexplainable—he put down his landing gear. Normally this would be no problem, even though it was a departure from the procedures he and Reimar had agreed to. Far more worrisome, it appeared that Ziller was approaching the airstrip much, much too low with wings level. During slow flight with the landing gear extended as well as the

landing flaps, the effect of the drag rudders would not be sufficient if one of the two turbojets were operating at 100% thrust. It was not enough to keep the aircraft in a straight flight path. In an all-wing one had to let the wing with the operating engine hang down during high thrust levels in order to maintain one's course. The fact that Ziller's wings were level while he fruitlessly varied the thrust in the good engine indicated that Ziller may have forgotten to drop his wing and instead tried to vary the thrust in order to stay in the same direction of the Oranienburg airstrip. The ground crew watched in horror as he neared the railroad embankment with the aircraft's landing gear

*The Horten ground crew positions the Ho 9 V2 on the runway prior to engine start. The Luftwaffe officer on the left was sent by the Air Ministry to witness the historic first flight.*





fully extended. Would he have enough height to clear it, they wondered. Suddenly the wheels of the Ho 9 V2 tore back and the aircraft stalled, falling immediately to the runway. Sparks and pieces of the Ho 9 V2 were flying off as the aircraft slid down the airstrip. Ziller and the Ho 9 V2 might be okay afterward if the aircraft continued on its course. But it didn't. Several hundred meters down the runway the Ho 9 V2 began veering off to the left crashing into the trees lining the airstrip where it came to a fiery halt. The crash had destroyed the Ho 9 V2, and test pilot Ziller along with it. Was it mechanical malfunction? One of the two Junkers 004 turbojets reportedly had flamed out. Had something gone wrong with the controls, something that prevented Ziller from gaining one additional meter of altitude before he reached the railroad embankment?

As much as they hate to say it, Walter and Reimar Horten believe the crash of their Ho 9 V2 in February 1945 was more likely due to pilot error than to mechanical malfunction. All of the twin-engine Horten aircraft, including the Ho 9 V2, were designed to fly with only one engine, even when landing—and they had seen this work. In the fall of 1943, Deputy Führer Göring had asked the brothers for a flying demonstration of one of

their two-engine models. He was particularly interested in seeing the Ho 7 perform. An Ho 7 was flown to Oranienburg's airfield at the appointed time when Göring would be at the field to observe the demonstration. Just as Heinz Scheidhauer was ready to take off, Göring told Reimar that he would like to see the Ho 7 perform on only one engine. He mentioned to all those in attendance that none of the so-called twin-engine "B" planes in the Luftwaffe could function on only one engine, and he said he wanted to see if the Horten twin-engine Ho 7 was any different. Scheidhauer took off with both engines and at a height of 20 meters (320 ft) began making curves, banks, and turns to demonstrate the Ho 7's flying qualities. Then he shut down one engine and continued to fly, climbing, turning, and making curves just as before. "I've seen enough," said Göring. "Now he can land. This has all been very impressive." He was satisfied because the straight ahead flight on one engine would require much greater skill on the part of the pilot. But, they argue Ziller presumably had that experience. Others claim that Ziller had never flown and landed a Ho 7 on only one engine so that in fact he didn't have the experience. Nevertheless, Reimar reports that the Ho 9 V2 was designed to be able to land on a single engine with its landing

gear fully extended. The single turbojet would be required to deliver only about 3/4 thrust, even with the landing gear extended and with a full drag rudder. Even at full thrust, the Hortens maintain, the Ho 9 V2 was capable of directional stability with a fully extended drag rudder. Landing under such conditions, either 75% or 100% thrust from a single engine, simply meant that the wing tip on the side of the good engine would have to be dropped, the engine cut back to zero thrust over the landing strip, the drag rudder immediately retracted, wings now level, and the Ho 9 V2 flared into a gentle touchdown. Such landing should present absolutely no problem for an experienced pilot of all-wing aircraft, the Hortens contend.

Walter and Reimar were at Göttingen working on the proposal for Colonel Siegfried Knemeyer's top-secret Ho 18, the atomic-bomb-carrying "*Amerika Bomber*," when a telephone caller informed them of the crash of the Ho 9 V2 and the death of Erwin Ziller. They both recall feeling anger and rage when they received the news. Ziller had disobeyed their orders and in the process had destroyed the only flying prototype of the all-

*Above: The Ho 226 (Ho 7) flies over a patchwork countryside in the early 1940s.*

wing Ho 9 V2. With terrible suddenness everything they had worked for, all the risks they had taken, all their efforts to avoid detection by the *Luftwaffe* and the Air Ministry, all the work they had put in to get the Ho 9 V2 proposal accepted . . . all this had been wasted effort.

It was nearly March 1945 now and the Hortens, like most other people, believed the end of the war was not far off. It was too late to build another Ho 9. Walter and Reimar Horten were thinking now not so much about contributing to the war effort as about what they would be doing after the war. Reimar, at least, was thinking that some of the Allies might be in-

terested in his all-wing designs, and he was hoping to continue his design work for either the United States or England if he could. He had wanted the Ho 9 to be the basis for possible employment. Now that it was lost, he felt that everything about his future work was in doubt.

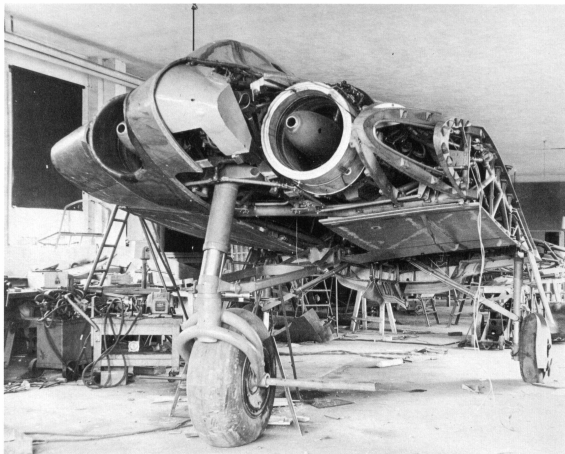
Several days after the loss of the Ho 9 V2 and test pilot Ziller, Walter submitted a written report of the accident to the Air Ministry. In the report he cited the cause of the accident as pilot error during a single-engine emergency landing. The Air Ministry's reaction was indifference and unconcern. Seldom did a new prototype aircraft go through a series of early test flights without some accident happening through either pilot error or mechanical difficulties. In the case of the Ho 9 V2, the Air Ministry felt that it was unfortunate

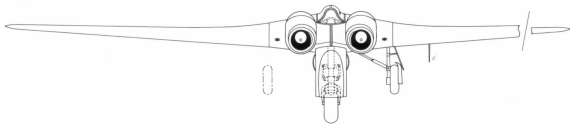
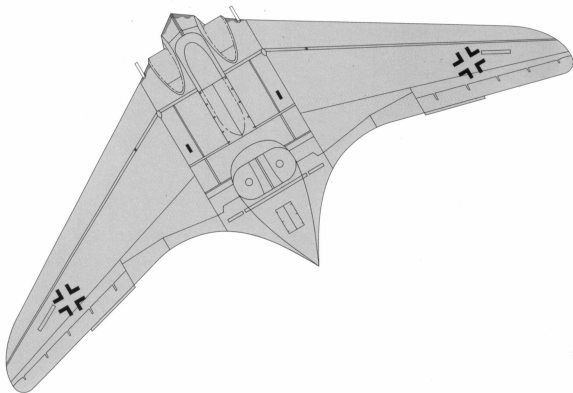
but something that occurred regularly in the aircraft industry. Neither the Air Ministry nor Deputy *Führer* Göring had changed their opinion of the Ho 9 because of the crash. They continued to believe that it was a fighter Germany dearly needed.

Orders for series production of the Ho 9, which was given a series designation of **Ho 229 A-1**, went out to Klemm and Gotha. Since most people involved with the Ho 9 V2 project believed that its crash was caused by pilot error, no changes were recommended in the design prior to series production. Klemm was to manufacture 40 of the Ho 229s, and Gotha 53. Gotha began work on its 53 units in February 1945. The firm was scheduled to build six prototypes for research, the Ho 229 V3 through Ho 229 V8. Proto-

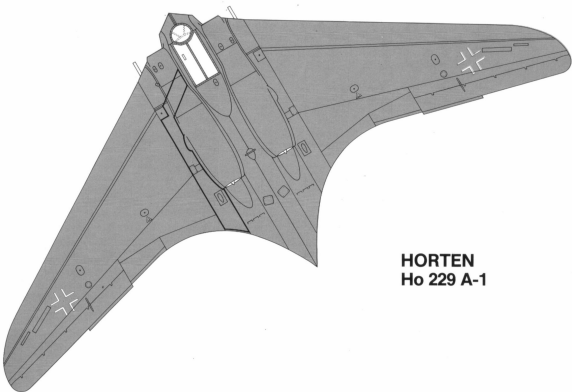
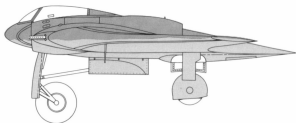
Continued on p. 28

*The incomplete Ho 229 V3 as it was found by American troops at Gotha's Friedrichsrode factory on April 14, 1945. Note the cockpit nose armor plate.*











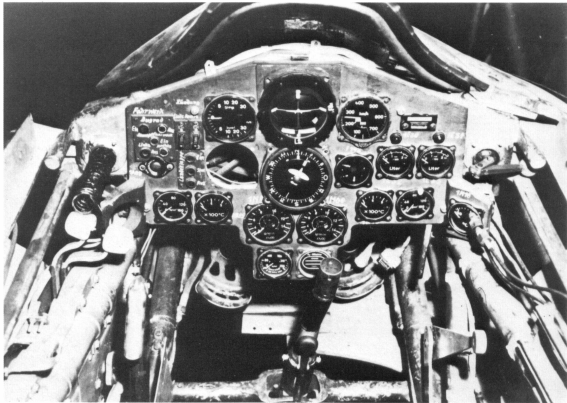




## HORTEN Ho 229 A-1

	<b>Color 81</b> Brown-Violet		<b>Color 76</b> Light Blue
	<b>Color 82</b> Bright Green		<b>Color 21</b> White
	<b>Color 83</b> Dark Green		<b>Color 22</b> Black

Since no more than two prototypes of the Ho 229 were completed before the war's end, and no formal directive is known to exist, documentation pertaining to camouflage colors and placement must remain speculative. However, based on general RLM directives issued late in the war, it is possible to conclude that the camouflage of the Ho 229 A-1 day fighter would have utilized uppersurface colors 81, 82 and 83 in pairs or singly. Undersurface camouflage undoubtedly would have been Color 76. National markings would have consisted of the simplified Balkenkreuz on all four wing positions. The Balkenkreuz would in all probability not have appeared since the aircraft lacked a vertical surface. Wing walk lines would have been applied to the port side of the center section in Color 28, Wine Red or Color 77, Bright Grey.



Continued from p. 25

type Ho 229 V3 was nearly ready for its first flight test when the U.S. Army overran the Gothaer Waggonfabrik workshops at Gotha in April 1945.

The Ho 229 V4 and V5 were scheduled to serve as prototypes for the **Ho 229 B-1** two-seat night fighter which was to carry FuG 244 Bremen radar. The Ho 229 V6 was the second A-series fighter prototype and would have been fitted with cabin pressurization in addition to FuG 16ZY, FuG 25a and FuG 125 electronics. Armament would have been neither four MK 108 or two MK 103 cannon. Two auxiliary fuel tanks carrying 330 US gallons (1250 liters) were anticipated for extended range missions. Construction of this prototype was well advanced when Friedrichsrode was captured by American troops. The two-seat Ho 229 V7 was planned as a trainer but was not completed. The Ho 229 V8 was supposed to have been the third A-series

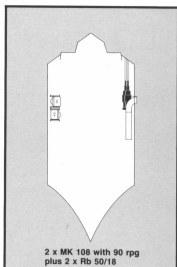
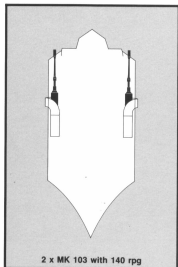
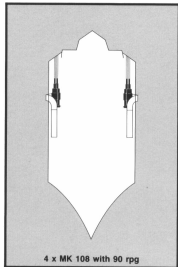
prototype with full operational equipment but it is unlikely work had been started on this machine. Bomber and Reconnaissance versions of the Ho 229 were also planned. With hard points attached under the center section, the bomber version was supposedly capable of carrying two SD 1000 bombs each weighing 2,205 lbs. The reconnaissance version was to be fitted with two Rb 50/18 cameras and reduced armament comprised of two MK 108s. Two 330 gallon auxiliary fuel tanks were also planned for this version however, by this time in the war, the situation was highly fluid and changing requirements resulted in many differing design modifications which were never finalized.

The third prototype is the only Ho 229 known to have been taken by either the Americans or the British. What happened to the other Gotha-built Ho 229 V prototypes is not known. Perhaps they were burned by the US Army troops, as were other Horten all-wing aircraft such

*Above: Flight and engine instruments may be seen in this view of the instrument panel as well as various electrical switches. Throttles for the two Jumo jets may be seen on the left side next to the canopy closing supports. The cockpit must have been noisy and drafty during flight. Note that with the nose wheel extended, the runway could be seen through the lower opening directly below the instrument panel. The vertical speed indicator, turn and bank indicator, airspeed indicator, AFN2 blind landing instrument, repeater compass and the fine and course altimeter are included. Right: Close-up of the main gear doors plus the under fuselage drag brakes in extended position. Shown opposite are three arrangements for weapons and reconnaissance cameras which were planned for production versions.*

as several Ho 3s and Ho 4s, a Ho 7,<sup>2</sup> and the Ho 9 V1. The Ho 7 and the Ho 9 V1 were at Brandis because they were being used in a flight training program for the pilots who eventually would fly the Ho 229s. In February 1945 the *Luftwaffe* had created a new fighter group, JG

<sup>2</sup> Ho 3 - Ho 250  
Ho 4 - Ho 251  
Ho 7 - Ho 226



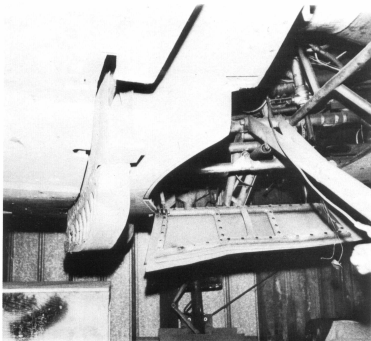
400. The pilots in this JG would fly Ho 229s, but they would be trained in the twin-piston-engine Ho 7. The decision to use Ho 7s as training machines for the Ho 229 was natural, for the aircraft had similar flight characteristics. A substantial number of Ho 7s would have been

required, and it is believed that Klemm would have given up its order to produce the Ho 229s to Gotha in favor of constructing the Ho 7s.

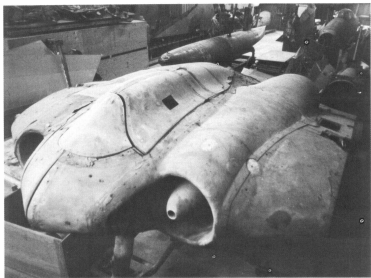
JG 400 had been in existence for months by this time having been formed to fly

the Me 163. As the war drew to a close, many proposals and counter-proposals were made to re-equip the unit with other aircraft as by this time the Me 163 had proven to be too unreliable for successful operation. Aircraft suggested for JG 400 included the He 162<sup>3</sup>, the Me 263 rocket interceptor (to counter the possible threat posed by the American B-29) and the Ho 229.

The Ho 229 V3 captured by the Americans was shipped to Wright-Patterson Air Force Base in Dayton, Ohio, after the war as part of "Operation Seahorse." Under this program, interesting but not necessarily flyable aircraft and prototypes were taken to the United States for evaluation. Air Force officials had intended to complete the Ho 229 V3, but before they got around to working on the machine, budget cutbacks in the late 1940s and 1950s forced them to abandon the idea of making it ready for flight. The sole surviving Horten Ho 229 is now in storage at the National Air and Space Museum's warehouse at the Paul E. Garber Facility in Silver Hill, Maryland. It is scheduled to undergo a complete restoration and be ready for public display in the National Air and Space Museum sometime in 1985.



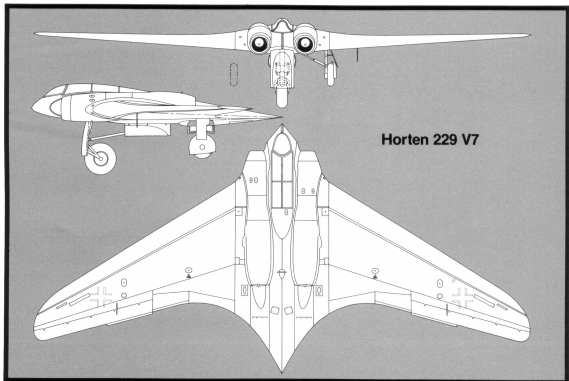
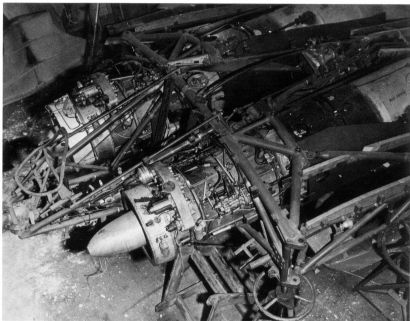
3 See Volksjäger, CLOSE-UP 11, Monogram, by Smith & Creek.



Left: When the Hortens proceeded to substitute the Jumo jets in place of the BMW 003s, they found the Junkers engine was 28 in (71 cm) longer and up to 7 in (18 cm) larger in diameter than the BMW 003. The Jumo 004 was simply too large to be buried in the wing, and the entire engine now bulged atop the center section even though this area was nearly 3 ft (1 m) thick. In spite of the seeming opaqueness of the plexiglass canopy, thorough cleaning will restore its transparent quality. Scheduled for complete restoration by the talented staff of the National Air and Space Museum's Paul E. Garber Restoration Facility at Silver Hill, Maryland, the task is expected to require considerable time. Below: Completed tubular frame of the aircraft's center section destined for an unidentified prototype being viewed by an American soldier at Gotha's Friedrichsroda facility on April 14, 1945.

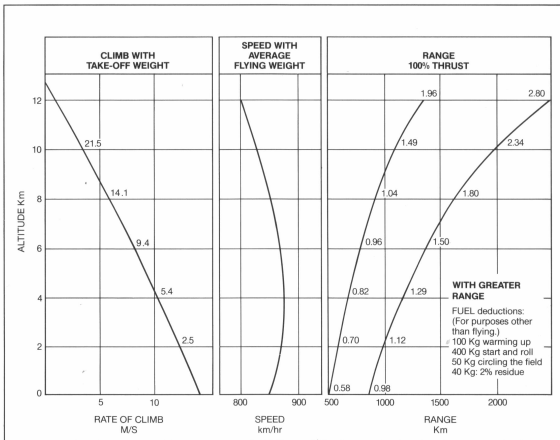


Right: Taken in April 1945 following occupation by members of the US Third Army, this photograph shows what is generally thought to be the incomplete center section of the Ho 229 V6 at Gotha's Friedrichsroda plant. Clearly shown are the two Jumo 004 B-2 turbojets mounted within the tubular frame and containing the basic provision for the cockpit and pilot's accommodation in the forward nose position.



# WEIGHTS, SPECIFICATIONS AND PERFORMANCE STATISTICS

Aircraft type		Ho 229 V1	Ho 229 V2a	Ho 229 V2b	Ho 229 V3
Role		Test Prototype	Test Prototype	Test Prototype	Fighter Prototype
Seating		1	1	1	1
Wing Area	m <sup>2</sup> (ft <sup>2</sup> )	52 (560)	52 (560)	52 (560)	53 (570.5)
Wing Span	mm (ft-in)	16,760 (54 - 11¼)	16,760 (54 - 11¼)	16,760 (54 - 11¼)	16,800 (55 - 1¾)
Length	mm (ft-in)	7,600 (24 - 11¼)	7,465 (24 - 6)	7,465 (24 - 6)	7,465 (24 - 6)
Height	mm (ft-in)			2,810 (9 - 2¾)	2,810 (9 - 2¾)
Weight Empty	kg (lb)	2,200 (4,850)	4,082 (9,000)	4,600 (10,140)	5,067 (11,170)
Takeoff Weight	kg (lb)	2,400 (5,291)	7,938 (17,600)	8,500 (18,739)	8,999 (19,840)
Engine type		None	2 x BMW 003 A-1	2 x Jumo 004 B-2	2 x Jumo 004 B-2
Maximum thrust	kg (lb)		798 (1,760)	900 (1,983)	900 (1,983)
Maximum speed at sea level	km/h (mph)			950 (590)	949 (590)
Maximum speed at 12 km (39,372 ft)	km/h (mph)		1,046 (650)	977 (607)	977 (607)
Cruise speed at 10 km (32,810 ft)	km/h (mph)		697 (433)	690 (429)	632 (393)
Service ceiling	km (ft)		15.8 (52,000)	16 (52,496)	15.8 (52,000)
Landing speed	km/h (mph)		145 (90)	145 (90)	156 (97)
Rate of climb	m/min (ft/min)		1,311 (4,301)	1,320 (4,331)	1,311 (4,301)
Flight duration	hrs		4.5	3.0	4.5
Armament		None	None	None	None





The Ho 9 V2 at Oranienburg in December 1944.

The Horten brothers did not have an exclusive on the all-wing aircraft. In fact, even within Germany work of the noted aviation pioneer, Dr. Alexander Lippisch, was well known. In the United States, Jack Northrop's flying wings were making a name for themselves; but it was the young Horten brothers, working alone in Germany without government subsidies, which led them to perfect the all-wing aircraft. The jet-powered Horten 9 (often written "Horten IX" which is equally correct) was a bold step into the unknown world of all-wing, jet-powered aircraft. It was remarkable for a number of reasons: (a) initially it was conceived as a private venture, (b) it was to receive the revolutionary turbojet as its powerplant and (c) it was

ordered into production before all the "bugs" had been overcome as a front line fighter for the declining Luftwaffe. But the Horten brothers were quick to point out that it was not an end-all and they were busy working on second and third generation all-wing aircraft with superior characteristics before the war's end.

Dr. Myhra traveled to Argentina just prior to the Falklands/Malvinas action in 1982 to personally interview Reimer Horten and then a few months later to West Germany to meet with Walter Horten. The fruits of his research and interviews are in this title.

One myth which has persisted since the end of the war has to do with the correct Air Ministry designation of the Horten 9. Most sources have mistakenly identified the jet fighter as the "Gotha Go 229" when, in fact, the true and officially correct designation is Horten Ho 229. When incomplete prototypes were found by American forces at Gotha's Friedrichsroda's plant, it was inaccurately concluded the aircraft were products of the Gotha concern. The RLM's Technical Office assigned the identification number 229 to the Horten 9 in conformity with established procedures. In a similar way, the proposed trainer for the Ho 229, the Ho 7 (Ho VII), received the official RLM designation Ho 226.

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#### CAMOUFLAGE & MARKINGS

The first two prototypes of the Horten 9 were finished in two camouflage colors. All upper surfaces were painted in Gray-Violet 75, while all lower surfaces received color Light Blue 76. The demarcation line between the two colors was soft-edged, with the top color overlapping the leading edge slightly in a uniformly straight line. The wing walk area, originating on the left rear side of the center section and extending up to the cockpit entrance, was identified by two parallel lines painted in color Wine Red 28. Next to the wing walk entrance was the admonition "Nicht betreten" in two lines, also in color 28. Adjacent to this was the aircraft data block containing eight lines of statistical information such as the aircraft's serial number, weights and home airfield. This information was applied in color Black 22. Over all surfaces was applied a coat of 00 Waterbright, a clear finish which could be highly polished.

Although the Ho 229 V3 was never finished before the war's end, it undoubtedly would have been camouflaged in the new colors then being introduced on all day fighters. These colors were 81, 82 and 83 for upper surfaces, with color 76 Light Blue reserved for the under surfaces. Unlike most fighters of the period, the Horten 229 would undoubtedly have used a single color for its upper surfaces. This could have been any one of the three colors: 81 Brown-Violet, 82 Bright Green or 83 Dark Green. Our illustration within the centerspread is typical of what would have been employed had successive prototypes and/or production aircraft been completed.

German national markings carried by the Ho 229 were confined to the Balkenkreuz on four positions as shown by our illustrations and

As will be seen in the accompanying photographs, the sole surviving Ho 229 is presently awaiting restoration by the experts at the National Air and Space Museum's Paul E. Garber Facility at Silver Hill, Maryland. The precise date for completion of the aircraft restoration is uncertain at the time of writing but it may well be before 1986.

The author and publisher wish to express sincere thanks to both Reimer and Walter Horten, for without their assistance and enthusiasm this report would have been impossible. Readers desiring additional reading on the life and aircraft of the Horten brothers are invited to secure a copy of **THE HORTEN BROTHERS AND THEIR ALL-WING AIRCRAFT** by David Myhra, which will also be published by Monogram Aviation Publications in the not too distant future.

- Photographic credits  
Deutsches Museum: 5, 24T  
United States Army: 25, 30B, 32  
Heinz J. Nowarra: Cover, 22, 23B  
All other photographs are from the author's private collection.
- Drawing credits  
ROC Graphics: 9, 13, 18, 26, 27, 31  
John Amendola: Centerspread
- Back cover design Horten monogram

by the drawings on pages 26 and 27. The Ho 229 V1 and V2 used a black and white cross (B3 style) on both upper and lower surfaces. The Ho 229 V3 and subsequent aircraft undoubtedly would have used a simplified cross (B6 style) for upper surfaces while underwing crosses would have been either the black and white B3 style or the simplified B4 style. Since there was no vertical surface to display the Halkenkreuz (swastika), none was used. Finally, fuel filler points would have been identified by the customary yellow and white equilateral triangles.

Readers desiring additional information are encouraged to obtain a copy of **THE OFFICIAL MONOGRAM PAINTING GUIDE TO GERMAN AIRCRAFT, 1935-1945**, listed on the inside back cover.

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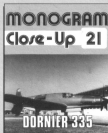
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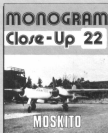
HORTEN 229



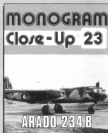
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