MESSERSCHMITT
Bf 109G-6
MIDWEST AERO RESTORATIONS, LTD

Messerschmitt Bf 109G-6

JAMES CHURCH Photography JAMES CHURCH

A major milestone in the rebuild of Messerschmitt Bf 109G-6 *Gustav* WkNr. 410077 took place Monday, May 23, 2022, in Danville, Illinois, when the Daimler Benz (DB) DB 605 roared into life and the aircraft at long last took flight in the hands of well-known test pilot Steve Hinton, for the first time since its loss in 1944! Midwest Aero Restorations, of Danville, had been tasked by owner Dr. Bruce Winter, of San Antonio, Texas, with the job of returning this aircraft to flight eight years ago and has now completed that task, resulting in this truly momentous occasion. Now that it has returned to the air, it is arguably the most original, as well as most authentic, of this rare breed flying, such was the effort expended in getting it here

Mike Vadeboncoeur's Midwest Aero Restorations crew has a long and distinguished reputation for returning World War Two fighters not only to flight, but to pristine, better-than-new, award-winning condition — a fact of which they are most proud. Rebuilding a Messerschmitt Bf 109 would be a different prospect than they were used to, however, being far more versed in the ins and outs of North American Aviation's (NAA) masterpiece, the P-51 Mustang. A number of these had gone through Midwest's doors in years past — all of them award-winners. The completion of the Bf 109 is more than a nice feather in its cap. It also showcases the versatility of these talented restorers to take on whatever project comes their way. It is a monumental achievement, in no uncertain terms. Dedication and tenacity saw the project through to completion, and the result is stunning.

German-specification materials, or their nearest equivalent, were used throughout, including proper metal gauges and rivets. All instrumentation is original, as are the radios and all other fittings and components. A worldwide search was often conducted in order to locate serviceable or rebuildable items for this purpose. All markings were researched to make them as authentic to when the aircraft was lost in action. For this purpose, well-known historians Lynn Ritger, Floyd Werner, and Mark Sheppard were brought into the fold for their opinions on how to proceed. The end result is stunning and is a testament to their diligence and research.

A TRUE WARRIOR, RETURNED FROM A WATERY GRAVE

Bf 109G-6 WkNr. was built at Messerschmitt's Erla facility sometime in September 1943 and initially bore the fuselage delivery code "RK-LY." It would seem that the aircraft was then delivered to JG-54, the famous *Grunherz* ("Green Hearts"), on the Western Front. Markings that were still evident on the fuselage show that it was the personal aircraft of the *Gruppe* ("Group's") technical officer of the staff flight, as well as the yellow theater markings typical of the period.

As Luftwaffe loss records from the Eastern Front are as murky as the lake it was eventually recovered from, the details of this aircraft's loss are sketchy at best. What is known is that sometime in February of 1944, after receiving damage from either air-to-air or ground-to-air combat, or a combination of both, a forced landing was made on the frozen surface of Lake Swiblo, near the Estonian-Russian border. It had taken hits to its wings, tail, and engine, causing a great deal of damage. The pilot, whose name remains unknown at this point, having previously jettisoned his canopy, no doubt made a quick retreat westward across the frozen lake to the relative safety of the nearby woods and the German forces, as he was now behind enemy lines. He did find time to grab the aircraft's clock and gunsight in the process, however, and he took these along with him in his desperate attempt to avoid capture.

To prevent the aircraft falling into the hands of the enemy, the Germans riddled it with machine gun fire and other munitions. There the by-now very forlorn Messerschmitt would remain until the spring thaw, at which point it slipped below the surface of the lake and was forgotten for the next several decades. With "glasnost" came an opening of markets in the former Soviet Union to the West. Soon it was discovered that there was a huge market for artifacts of the Second World War, aircraft in particular. One of the first combat aircraft recovered with this in mind would be Bf 109G-6 WkNr. 410077. Retrotechnika, a small company based in Moscow, conducted the recovery, and this was performed in 1990. The aircraft was then disassembled and transported by truck to the Monino Airfield, near Moscow, awaiting a buyer.

Enter Ed Zalesky, of Surrey, British Columbia, Canada. He had purchased several of the wrecks recovered in Russia, including the Bf 109. These were then again offered for sale, at which point it would be acquired by David Prewett, of West Heidelberg (rather fitting), Australia. The aircraft was placed on the Australian civil registry for a short time as "VH-BFG," and a hunt was begun for all of the missing parts required to rebuild it, along with a suitable engine, as the original that came with it had suffered combat damage and was seized. Many items to support the rebuild were gathered; however, not much, if any, actual work was conducted on the airframe itself during this time. In November 2005, the now very-well-traveled Messerschmitt went back to its home country of Germany, under the new ownership of Axel Urban. Everything was then shipped to Munich in two twenty-foot shipping containers and placed in storage while a suitable venue for restoration was considered. This never came to pass, unfortunately, and the project was once again back on the market.

The aircraft made another ocean journey to the United States this time. Dr. Bruce Winter, an ex-Navy F/A-18 Hornet pilot and warbird owner, acquired the project in 2012. Dr. Winter owns the immaculate P-51D Mustang known as *Happy Jack's Go Buggy*, which he flies often in San Antonio. This aircraft had been completely restored for him by Midwest Aero Restorations, which is world-renowned for its abilities in creating top-notch, award-winning aircraft. Therefore there was little thought as to who would get the job to rebuild the Messerschmitt. Mike Vadeboncoeur, David Young, Steve Schultz, and the rest of the crew at Midwest dug in and took inventory of what they had to work with. There were many more items that required tracking down, and a large amount of structural work would be needed to achieve the goal of a safe, airworthy aircraft. To that end, while a considerable amount of structure and skins required replacement, there is still quite a large percentage of original material remaining.

Everything in the aircraft is period-correct, including the fuel tank installation, oxygen bottles, gunsight, radios, and demilled cannon and machine guns. As mentioned before, absolutely no effort was spared, nor any area of the rebuild neglected. While eight years may seem a long time to restore an aircraft of this size, *Warbird Digest* can verify from having followed and visited this project since its inception that every nook and cranny of this aircraft is as perfect and correct

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Opening pages: David Martin conducts a ground run of the recently completed Bf 109G-6 at Danville, while Midwest Aero employee Ryan Keene monitors.

Opposite: Bruce Winter rolling out after landing, following a dusk flight in the Bf 109.

Above: The Messerschmitt emerges from its watery grave, where it had remained since 1944. *Victor Kulikov via Mark Sheppard*

as possible. To achieve this takes time and a great deal of effort researching these items in detail and consulting experts in their particular fields for input. Midwest Aero is known for its Mustang restorations above all else, and rightly so. The Bf 109 is definitely a horse of a different color, however, and there was a tremendous learning curve involved as a result. While in many cases it is true that "an airplane is just an airplane," there were many quirks and idiosyncrasies to be learned while rebuilding the Messerschmitt! In the end, all were overcome and the aircraft is a true testament to the determination of the owner and Midwest Aero to see it through to completion.

RESURRECTING AN ICON

The idea of rebuilding a Bf 109 came as a bit of a surprise to Vadeboncoeur: "Of course we had finished *Happy Jack's Go Buggy* in 2008 for Bruce, and we continue to maintain it to this day. We were all very proud of the *Buggy*, and of course winning Grand Champion World War Two at AirVenture was a highlight, as well as the National Aviation Heritage Invitational (NAHI), by winning the Neil Armstrong Aviation Heritage Trophy at Reno later that year. A few years later Bruce called me and asked me if I was sitting down. I thought, 'Uh oh…'

"He had an idea, and it was quite intriguing. Bruce has always had an interest in aviation history, and in particular reading about the combat flying experience accounts of both Allied and Axis aircraft pilots. This led him to want to explore the German fighters more closely. Ultimately, Bruce had been looking at various Bf 109 projects that might be available, of which there were very few! We traveled to a small town just outside of Munich, Germany, in January of 2012 to initially view this project. We also looked at one in England and another in Austria. But this one kind of stood out among the few he had found. We looked at all of the available projects in January of 2012. Although this airplane was in pretty rough shape compared to a few of the other projects that were farther along, he decided on WkNr. 410077 due to its provenance and known history, and because of its overall completeness. It had a very nice DB 605 engine with it as well, which of course is very important to the ultimate ability to fly such a rare machine authentically. The decision was made early on in the project that this would be an authentic '*German*' restoration, and not an American or AN conversion of standards. This was our goal of course with HJGB, to make one of the most authentic Mustangs we possibly could at the time." Authenticity would be key in the goal of returning this aircraft to flight, and keeping it authentic, and using as much original structure as would be possible in the process.

Upon initially viewing the project, it would immediately hit them as to the work that would be ahead of them. According to Vadeboncoeur, "The airplane was structurally all there, which for a 109 project among other rare types was a huge plus. We had good patterns, and much to our surprise we had quite a bit of structure to work with and reuse. Nothing structural had yet been restored on the airframe. Nearly all of the components had been stripped from the aircraft and were in boxes and/or crates. It would have been so much more informative if we had the opportunity to remove all of that; however, as the airplane had passed to a few different owners over time that would not be the case. This from a structural standpoint was the largest undertaking we have ever done here at Midwest Aero.

"Although we do have nearly all of the structural fixtures for P-51s, we had nothing for the 109. We had to build tooling for parts, reverse-engineer many components as well. We had also become acquainted with Hubert Hartmair from Freising, Germany, on our initial visit, who has done many structural rebuilds of Bf 109s in Europe. We knew from the beginning that Hubert and his team of Hans, his brother, and Stephan Volk would be instrumental in helping us with the fuselage and other structural components. It was our intention to send the fuselage structure back to Germany and allow them to use any remaining structural and other components internally that they could for the rebuild. Also, our plan was for Midwest to do the wing restoration."

Deviation from restoring the types they are most acquainted with, and trying their hand at "something different," had been something Vadeboncoeur had been pondering for some time. As he told *Warbird Digest*: "At one time, we had discussed, and I had made it known via a few magazine interviews, that while we've been known for restoration of both the NAA P-51 Mustang and Texan, it would be really neat to try something different. Be careful what you wish for! The 109 is completely different from anything we have ever worked on. The rivets, for example, have a different angle on the rivet head that meant we had to retool all of our countersinks and dimples for the job. Also, the rivets of course were metric and the material specifications for those rivets, what was the equivalent to US standard semi-icebox rivets, meaning we could not just replace them with the common AN/MS-type rivets typically used today. Early on in the project, during our initial search for rivets, we talked to Dave Goss from GossHawk Unlimited, in Casa Grande, Arizona, who were in

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Opposite, top: Mike Vadeboncoeur displaying the original, unrestored forward engine cowl ring.

Opposite, center: Some of the original components, "as received" and prior to restoration.

Opposite, bottom: The Germans shot the aircraft full of holes to prevent it being of use to the enemy as it sat on the frozen surface of Lake Swiblo. This is but one of many the aircraft incurred.

Below: The Bf 109 project as received by Midwest Aero Restorations. *Mike Vadeboncoeur*

the process of building the Collings Foundation Fw 190. They were in the middle of getting some rivets fabricated as well, and were kind enough to allow us to co-op the purchase of a complete ship set quantity and size as listed for the Fw 190, as we had no listing for the amount of rivets we would need unlike the list that existed for their project. So we basically bought a ship set of rivets for the Fw 190, as they were all of the same DIN specification type. We were grateful for Dave Goss and the Collings Foundation, owners of the Fw 190 for their assistance with the rivets." It is this type of cooperation between restoration shops that results in difficult restorations not only moving forward, but being completed to such a high standard as is the case with the Bf 109.

TRULY AN INTERNATIONAL EFFORT

Rebuilding of Bf 109s isn't exactly a new science, though it may have seemed the case at first to the Midwest Aero team. A number of original Bf 109E aircraft had been rebuilt to flight previously, along with a Bf 109G or two, and of course several Spanish-built Buchons had been converted to DB power over the years. The majority of this work had been performed by various overseas concerns, which had tooled up to undertake the work required. With a complex rebuild such as this, it always makes sense to use the services of those who have gone before you, relying on their expertise and know-how, rather than trying to reinvent the wheel yourself. No matter how much one may want to have a hand in every part of an aircraft's rebuild/restoration, it behooves one to take advantage of those with the tooling and expertise to get the job done...and in a timely fashion! Doing everything yourself only adds more cost and time to complete the aircraft; and in the end, when a customer is paying the bill and wants it sooner rather than later, such concessions are necessary from time to time.

Of this cooperation between rebuilders, Vadeboncoeur praised those who lent a hand in returning this aircraft to the air: "We, as mentioned above, had the plan to allow Hartmair to build the fuselage from the beginning. This would save time and money since we would have had to come up with tooling and all of the design costs associated with that. Plus, the fuselage, while it may look simple, is far from it. The design is really brilliant in that with most US-built aircraft you would have bulkheads, or formers if you will, that are the basic shape of the airplane internally; then they would apply, via various methods, the skin to those internal formers. The 109 has progressively smaller fuselage sections going back toward the tail. Every other progressive section from behind the cockpit to the tail is a piece of aluminum skin that is formed for shape along with the former being built into the skin section all in one half. The former/skin assembly is split at the top and bottom to make 'halves' of the fuselage, and these are then joined by a longitudinal stringer assembly. Every other section in-between the formed sections is just a flat sheet that overlaps to the next section going aft. It is really a unique design and requires some complex tooling and forming processes.

"While Hartmair was working on the fuselage, we had started to begin wing-building here, in-house. Once the fuselage structure was done, we would of course then begin to add systems into the airframe. We had a lot of help from individuals as well: Markus and Michael Rinner from Austria, Gregor Guttenberg from Arsenal-45 in Germany, and the late Karl Bircsack from the International Aviation Museum Foundation in Hereg, Hungary, as well as Andreas Haferkorn from the Messerschmitt Foundation in Germany." Working on a foreign aircraft, in conjunction with foreign rebuilders, presented its own set of problems, not the least of which was an obvious language barrier. Vadeboncoeur continued: "Our biggest challenge was of course the language barrier and the limited corporate knowledge of the operation of the type in general.

"We had lots of good data for the 109 to help us out; however, systems installation data is limited. We relied extensively on original photographs and all of the manuals we could get our hands on. As mentioned earlier, our goal was to make this an authentic, German Bf 109, and no compromise was made on the authenticity. That meant that our hoses fittings would be the original Argus-type fittings. Also, the hard lines with what we typically call 'B' nuts and sleeves would have to be fabricated new, as some of those particular parts are unavailable. Materials conversion was another factor that meant in some cases we would have to send samples to an engineering firm to confirm a suitable modern-day replacement material. Our main sources were the limited drawings we had, and the original manuals. With that said, we used any and all 109 books that we could that had nice details. We also sourced all of the NASM ME109 project notes and photos, which were very helpful! Also, some of our good friends in Germany and Austria were very helpful with photos that were emailed on occasion.

"Where it was possible, we used metric material thicknesses; however, in most cases our US standard is very close to the metric sizes for sheet goods. Rivets I had mentioned in an earlier

Opposite, clockwise from top left: Original, unrestored FuG-16Z radio.

The upper right wing displaying original Luftwaffe markings, prior to restoration.

The original wooden structure as removed from the fuselage, just aft of the cockpit. *Mike Vadeboncoer*

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Steve Schultz fabricated the wooden interior components for the fuselage.

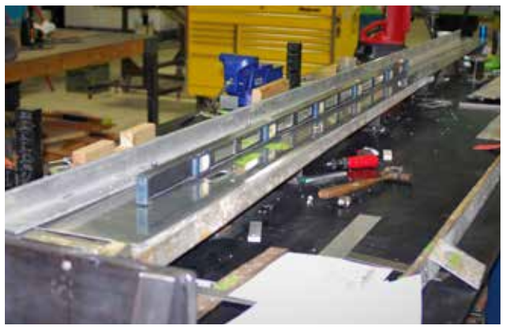
Mike Vadeboncoeur and Dave Young deciding on a plan of attack to restore the right wing.

The rebuilt DB 605A as completed by Mike Nixon's Vintage Aero Engines. *Mike Vadeboncoeur*

Below, top to bottom: The interior of the unrestored fuselage gives some idea of the amount of work required in this area.

The newly rebuilt fuselage was placed in a rotisserie jig to facilitate gaining access for interior work. *Mike Vadeboncoeur*

The main spars were perhaps the most complicated, time-consuming portion of the rebuild to accomplish.



email were a semi-icebox-type rivet. Of course we had them made in cooperation with the Collings Foundation Fw 190 project, as many of the items we reused in the structural parts of the airplane were sized for metric rivets. The standard difficulty, you can imagine, comes to play when thinking about retooling for all of your structural sheet-metal work. This includes different countersinks, dimples, drill bits, and rivet sets for the different type of round rivet sets!"

SEARCHING FOR PERFECTION — AND PARTS!

When asked if there had been any major pitfalls, obstacles, or particularly hard to find components along the way during the Bf 109's rebuild, Vadeboncoeur noted, "There were many difficult phases of the project, but a few that stand out were the instrument overhauls and getting a good altimeter and airspeed indicator that would not leak internally. We finally found a company out west who has since sadly closed their doors to get those repaired for us. Some of the components like the correct magneto switch and starter switch assembly were sourced because the ones that came with the airplane were not correct for our G-model 109. The mag switch looks similar in most German airplanes; however, there are subtle differences. Same with some instruments. We had a fairly nice set that arrived with the project; however, some were not exactly correct, so we had to source those. Armament items are extremely rare and difficult to get, as you can imagine. For example, we had to fabricate the feed chutes for the MG131s because they are extremely difficult to find. The electrical system is also unique from American systems. We use airframe for ground in Mustangs, for example; however, the 109 has a wire for each ground, much like you might see in home wiring. That added a lot of extra wire, as you can imagine. Most circuit breakers and switches were fairly easy to obtain and are installed as per original."

Vadeboncoeur continued: "We had to source a new set of landing gear for the airplane, as the originals were too far corroded. Also, the main gear attach brackets had too much pitting and corrosion, so a new set was acquired from Hartmair in Germany. They are beautiful parts that tie the firewall fuselage corners, lower engine mount support structure, and forward wing attach and gear all together. There was much frustration during the project, as it was hard to plan for exactly what you needed, especially with fittings. We were able to purchase many original-type fittings; however, some we had to manufacture. And when you manufacture, in most instances it is cheaper to purchase more than you need; however, how many original-type German fittings for a 109 does one need to keep in stock? We had a lot of the original radio equipment, and that was carefully reassembled and restored by one of our late co-workers, Doug Marlatt. Doug did a marvelous job restoring and detailing those components for the radio package. The use of wood inside the airplane was fairly extensive. Primarily the fuel tank area was lined with wood to protect the rubber tank from chafing internally. Also the radio rack, compass unit, and some interior electrical components were all held together by wood structures."

THE RIGHT PEOPLE FOR THE RIGHT JOB

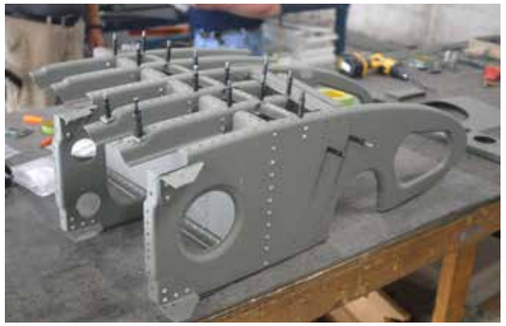
Vadeboncoeur's right-hand man of many years, Dave Young, was picked to spearhead this project. He told *Warbird Digest*, "My responsibilities, I guess, would be the project manager. Steve Schultz and I were the primary workers on the project, and whenever we needed extra help we would grab one of the other guys in the shop. Steve is very good at fabricating parts, so he would do a lot of that kind of work. I would do a lot of the assembly work and researching how things were made and assembled. One of the project's most significant challenges was restoring everything to its original specifications. We spent a lot of time researching books and pictures to make it as authentic as possible."

He went on to say, "We had been talking about how it would be fun to try to do something different, other than the Mustangs; so when talk of a 109 came up, it certainly sounded interesting, and the history of this airframe got us even more excited. We knew the project would be a challenge, but we didn't know what we were getting into. Throughout the project, we would joke that we don't know what we don't know. Any time you take on something new, there is a learning process, and this was definitely a learning process. And then there was the language barrier — that added another level to the difficulty. As we progressed with the project and started to get into the systems, things became more difficult again from the originality standpoint. Making everything function properly is one thing, but putting it all back original as they did before added to the difficulty.

"The first area we started on was the wings. Most of our experience with airplanes was with North American airframes, and in particular the Mustang. The Mustang is a simple airplane as far as construction, so it was interesting to see how Messerschmitt built their airplanes. Regarding construction, the wings were pretty simple, other than the spar. The spar is the most complicated piece on the wings. It is a built-up spar, and everything is tapered into each other."

Young continued: "The spar design entails a web with four extruded angles riveted on the top and bottom of the web. The inboard portion of the angles are tapered into the upper and lower attach points. The outer portions of the extrusions extend two-thirds of the way down the spar, and the rest of the length is an aluminum angle. On the upper and lower part of the spar there is a flat aluminum plate that is tapered down to nothing as it goes to the outboard, and on the inboard side it tapers into the attach point. In all there are eleven pieces that make up the spar. In the right wing we were able to reuse roughly 70 percent of the original structure. the left wing had more damage to it, and we reused roughly 30 percent of that wing's original structure.

"To add to the discussion on the spar, the spar was also difficult in that we had to make perfect drill holes perpendicular to the spar angles where the angles would sandwich the sheet web. This was held together along the entire length of the upper and lower sets of angles by rivets.



Above, top to bottom: A good portion of the interior structure of the wings was either reusable or used to make patterns to create new parts.

The nearly completed left wing in its jig fixture, which was custom-made for this project.

Left-hand in-board, forward wheel-well area inner wing structure is test-assembled prior to installation in the wing.

Drilling into those angles through the sheet and making nice holes was an interesting prospect. We decided to build a twelve-foot steel-top table and built a jig to bolt the spar to the table. Once we were on the reassembly phase, this allowed us to employ a magnetic drill that would magnetize itself to the table top and allow us to drill perpendicular holes through the spar angle, through the web continuing on the other matching angle on the other side. This, while time-consuming, ensured we had nice clean perpendicular holes drilled span-wise from the root to the end of the angles. Another interesting item was the spar shim plate. This plate was essentially a long tapered shim that starts at the wing root and tapers all the way to the end of the internal spar angles. This shim was just over nine foot long, around six inches wide, tapering in width to about 1½ inches, and in thickness from about 3/8 of an inch thick down to about 1/16 of an inch at the end. That was quite a project for the machine shop! Along with that spar work was the actual spar web that runs the entire length of the wing. Of course it was just beyond twelve feet long and about .100 thick, and aluminum sheet in that thickness typically only comes in twelve-foot lengths. Fortunately we were able to track down a sheet of aluminum which ultimately enabled us to have several spar webs water-jet-cut from that sheet of aluminum.

"Regarding the fuselage, it was pretty clever how they built it. Most of it is made in halves and then assembled. The horizontal and vertical stabilizers are held together at the leading edge with a piano hinge with a piece of fabric covering the hinge, which is quite clever and straightforward. The basic airframe was pretty simple overall. Once you started to get into smaller components, things began to get a little more complicated regarding how they built things. We would look at it and ask, 'Why did they have to make this so difficult?'"

When asked about the learning curve involved and figuring out German production techniques and philosophy, Young stated, "Certain parts on the plane left you scratching your head, asking, 'Why did they make something so simple, so complicated?' The first thing that comes to mind would be some of their fasteners. We [American aircraft producers] would have used something like a Dzus, and they would use a fastener made of about four or five pieces. The oil tank and coolant tank cap are the same way: overly complicated. They liked to over-engineer some things, and other areas, like the basic construction, are straightforward. Like I said before, they were very clever in building the basic airframe. Construction of the horizontal, vertical, and even the tail cone is built in halves, making putting these together easy. The wings have big doors on the bottom that allow you to get in and rivet the skins with little trouble. They built thousands of these, so they had production down."

On the subject of overall build quality, compared to the other types of aircraft produced in the US that have gone through Midwest's doors, Young stated the following: "I would say, for the most part, the quality was good. Most of the sheet-metal work was of the same quality work that we have seen on the American-built airplanes. You could tell their quality of material was not the same as ours. A lot of the steel components stood out the most, as far as quality. You hear a lot about the use of slave labor back then, but most of the workmanship that we saw was not something I would say was likely to have been produced by slave labor, however, as the quality overall was very good."

METAL MAGICIANS MAKING MAGIC

Midwest Aero employee Steve Schultz was instrumental in rebuilding the 109, being involved in every structural task, and many others performed on it from the project's inception. Schultz told *Warbird Digest* how he became involved and what his responsibilities had been: "In the summer of 2014, Mike Vadeboncoeur asked me if I would be interested in building a wing fixture for the Bf 109. I told him I would be interested in doing it that winter, when I wasn't so busy. We purchased steel to fabricate the wing fixture, and that arrived January 13, 2015. I spent approximately two months building the fixture to accommodate both wings at the same time. I then built the steel table to fixture and build the wing spars. We had full-size drawings made of the wing ribs, and I made templates to make the rib blanks. I cut out aluminum blanks with a router I mounted in the steel table I made for the spars. I made form blocks from PVC material and hand-formed all of the rear and center ribs and some of the nose ribs. We were able to use quite a bit of the interior wing structure, and the wheel well rib areas were in great condition and remain original."

Some work was beyond the capabilities of Midwest Aero to produce in-house, which required outsourcing at times. Schultz added, "We outsourced some of the heavier complicated ribs for forming. We were fortunate to have one good rear spar and one good main spar, so we had good patterns to remake them on the fixture table. I would say the main spar in the 109 is far more complicated than that of a P-51. It has many more pieces to it. It has an upper and lower spar cap that we had to outsource. It tapers both width- and lengthwise the entire length of the spar. Each spar has four angles attached, two of which are under 90 degrees and two which are over 90 degrees. It also has two other smaller angles. It is a very strong spar. We also fixtured the slats on the steel table and replaced the outer skins and two ribs. The steel table became a valuable resource for fixturing many parts, plus being able to use a magnetic base drill."

Many people with a host of skill sets assisted along the way, some more than others, obviously. However, every talent offered was most welcome and accepted to aid in the process. No matter how small that effort may seem to some, it all adds up to ensure the quality of the overall end product. Of this, Schultz was quick to note a couple individuals of particular noted ability and skill who stepped up to the plate when needed: "Doug Marlatt cosmetically restored all of the original radios that are now mounted back in the fuselage. They were mounted on a wood rack. I replicated the wood rack and reinforced it with .063-in. aluminum. The fuel tank under and behind the pilot's seat was surrounded with a wood enclosure, which was also fairly complicated. I reproduced it, and it is fastened up in the fuselage before the tank goes in. There are also some metal structures that go in to help support it all. As I continued to build many parts, I was impressed by the engineering in the airplane but also puzzled by the over-engineering of many parts. There were many ways that we would have simplified the design and manufacture of most parts. One example would be the tie-down holes outboard in the wing. It is a return bend formed in two halves with two steel plates to attach to the spar and wing skin. It has to all be welded together and then riveted to the spar and skin. It is very ingenious but very time-consuming to manufacture.

"The fuel primer for the engine has its own tank. I had never spun any aluminum before, but I spun two halves on our lathe and rolled a center piece and Jeff Gross, who does a lot of our welding, welded it up. It is mounted in the rear of the fuselage. I also wound up spinning part of the breather cap for the engine. The remote compass is mounted in the fuselage behind the armor plate. It was originally wood, but I made it out of aircraft aluminum, and then a friend of mine, Steven Rodman, veneered it with wood to give the look of the original. We had two replica machine guns, but I had to rework the guns and add parts to them. Some parts were really a challenge, but I thoroughly enjoyed every day looking forward to the next day and the next challenge."

Schutlz went on to say, "David Young did all of the wiring and hydraulic hoses and engine work — a convoluted system. David and I made and riveted all of the wing skins and the nose and buel cowls. There were a number of small wood parts in the plane usually made of plywood with very fine laminations. Dave and Mike did a great job painting the plane to original paint scheme, including all of the correct stencil and unit markings. All hardware and rivets have been kept metric, per the original build specifications. We certainly have had our bad days, though, when something didn't work out the way we thought it would, but we eventually worked it all out. The Bf 109 is a different animal than our warbirds."

Vadeboncoeur pointed out others who helped along the way, providing their invaluable services: "The propeller was fabricated by Skycraft Services in the UK. Of course we'd be remiss if we didn't mention Craig Charleston from the UK, as he was instrumental in his guidance and friendship from the very beginning. The engine was of course done by Mike Nixon of Vintage Aero Engines in Tehachapi, California, who has the only experience here in the US for the Daimler Benz engine overhauls. One big challenge was the fabrication of the oil tank assembly, supercharger inlet scoop, and the external fairings were all fabricated by Carleson Metal Shaping, and he did a fantastic job on those complex components. Erik Meier from Meier Motors has also been of great help and consultation. Meier was responsible for helping us with the various hydraulic components for the airplane."

Below, top to bottom: Mike Nixon's Vintage Aero Engines rebuilt the DB 605A V-12 installed in the Bf 109.

Dave Young looks the engine over following a flight.

THE "FINISH" LINE

All the tremendous amount of work involved up to this time would have been positively pointless if the final applied paint scheme were incorrect or botched in some way. A horde of Internet experts would invariably descend *immediately* if you were to get something wrong in that final, all-too-important step. Vadeboncoeur knows this well and has always called upon and accepted the help and educated input of experts in their field when researching paint schemes applied to aircraft they have completed: "The paint scheme was another task that I was concerned about, believe it or not from day one. We could have done a magnificent job rebuilding the airplane; and if we screw up the details of the paintwork, all would be lost. We took great pains to ensure our paint job was as accurate in detail, paint colors, and camouflage layout as possible. We consulted with what I consider the 'Big 3' 109 experts in Lynn Ritger, Floyd Werner, and my longtime friend Mark Sheppard. They were instrumental with confirmation of our application of the details and paint scheme. Floyd had made a model of the best interpretation of the remaining paint on the airplane, along with generally late-war 4100-series ME109 schemes from Erla. Combining those details, we came up with a likely representation of the actual airplane scheme. With that said, the airplane was lost in winter of 1944 and so it also likely had a commonly applied winter white camo sprayed over the standard paint. We even found several areas with the old white paint. But at this time we elected to finish it with the standard paint prior to application of the white. We might even do the whitewash overlay finish at some point."

Warbird Digest contributor and Bf 109/World War Two Luftwaffe expert Floyd Werner was both honored and humbled to be involved in this very instrumental part of the process: "My part in the restoration of this warbird was serendipitous. I was recently retired and going to attend a model show in Indiana. One of the show organizers was a guy named Ron Young. Ron asked me to head out to an unknown-to-me-at-the-time must-see Bf 109 restoration, so I drove the extra three hours to the hangar. When I walked in, I was greeted warmly by Bf 109 project manager Dave Young (Ron's brother) and Mike Vadeboncoeur. Apparently, Ron had mentioned to them that I'm a *huge* 109 fan; and if you want to know about Bf 109 paint schemes, then there are only two people to talk to: my friend Lynn Ritger and me!"

Werner went on to say, "So I showed up at the hangar and promptly was speechless at the magnificent restoration I saw before me. After drooling some and taking a few pictures, I sat down and talked with the guys about the correct, Luftwaffe colors of RLM 74/75 and 76. Since the show wasn't taking place for another day yet, I just happened to have a bunch of Bf 109 models in my travel case. After showing them to the crew, they asked me to build a paint master for them to emulate. I was then escorted to an adjacent hangar, where Dave and I laid out the original wing panel skins to determine the proper camouflage pattern, as most of it was still visible and in amazing, preserved condition. It became quite evident that the paint scheme on the wings was of a nonstandard pattern. I photographed the entire airplane, panel by panel, to get an accurate shape and to see where the demarcation between colors existed. Mike provided me with all the photos they had from the recovery, which also proved very helpful."

Researching correct color schemes and markings for World War Two aircraft can be a bit of a minefield at times. This is especially so with Luftwaffe subjects from the era, with their RLM coloring system, various applications of field camouflage, variations from unit to unit, and even different versions of the same schemes applied differently by the multitude of factories that were producing these aircraft. Scale-model builders have fortunately done the homework required in bringing this once mysterious and elusive aspect of historical correctness to light, and the information is readily available to those who care to seek it — a host of books and websites on the Internet created by and for modelers that are devoted to just about every air arm and their paint schemes and markings one can think of. There is no excuse in this day and age for getting the colors and markings on a new restoration wrong, and yet it happens all too often still. Vadeboncoeur knows this and the importance of getting the final stages — and those that are most visible — correct and relies heavily on those that know this trade well.

Werner continued: "One thing that was peculiar was that the aircraft belonged to JG-54 *Grunherz*, which usually painted the yellow theater band behind the cross, but in the case of '077 it was on the panel aft of the cross. Another interesting find was that as an Erla machine manufactured in 1943 I was expecting a 'sawtooth' camouflage demarcation pattern on the wings, but that was not accurate. The *stammkennzeichen* (factory codes) painted under the wings were also different. Typical codes of four "letters are letter-German cross-letter" and continued on to the other wing. This particular airplane had it as "letter-letter-German cross." Lynn and I discovered that, sure enough, Erla machines, at least from this particular block, had them the way '077 has them."

Below: The project nears completion in the Danville, Illinois, Midwest Aero Restorations hangar. Final details are being added, including stenciling and other markings.

More surprises awaited this Bf 109 "*Experten*" on scrutinizing the aircraft, causing him to wonder, "*Was ist los?*": "Another peculiar feature was that the yellow under the nose was uniquely applied. Normally, the entire lower cowling is painted yellow, but this particular aircraft had been masked off at the bend of the cowling so that only the lower portion was RLM 04. This showed the sides in RLM 76. The aircraft when lost and sunk into the lake did have a temporary whitewash over the entire airframe, but the restoration team did not want to apply that…at least not yet! Maybe someday! On my way home I contacted Lynn Ritger by phone, and we had a nice long conversation. We collaborated back and forth throughout the project. His help, knowledge, and expertise would prove invaluable."

A MODEL REBUILD — IT'S ALL IN THE DETAILS

Werner continued: "Once armed with all the photos I took, and those from the recovery, I started an Eduard 1/48-scale Erla Bf 109G-6 kit, with the intention of making it as accurate a representation of '077 as possible, with all of the information now available to me. While doing the research into the paint scheme, I utilized Marc-André Haldimann's Flickr Bf 109 page for further reference. This page is a veritable wealth of information. There I found more aircraft from the same production block. This is how I determined the actual camouflage scheme and pattern for the fuselage. Factories and production facilities tended to use a camouflage that was peculiar to that particular production block and factory. It is one way we can identify who built a particular aircraft, and to what production batch it belonged.

"Armed with all this information, I drew out the camouflage pattern as I saw it and checked my findings with Lynn. Once we were both satisfied, it was time to start painting. Since this model was to be used as a paint master representing the restored aircraft, not a battle-scarred aircraft in the combat theater, Mike requested no weathering be applied, so I deviated slightly from my normal painting process. I primed with Alclad Grey Primer. I would normally pre-shade the model with Tamiya NATO Black or German Grey, but I didn't have to worry about that step now. The colors are matched to the late Jerry Crandall's Eagle Editions color chips, so you know they are accurate. I started with the yellow areas. These were painted with Mr. Paint (MRP) RLM 04 and allowed to dry overnight. The paint is very thin and required multiple coats to cover. These areas were then masked off with Tamiya tape, and the MRP RLM 76 was added to the belly and fuselage sides. MRP RLM 75 was then sprayed over the entire wing and fuselage spine. Some RLM 75 mottling was next added to the fuselage. The mottling was very distinctive on an Erla machine in the 4100 series, with what I would best describe as 'clouds' of sometimes non-distinct mottling. There was no RLM 02 mottling that I could see on any of the 4100-block aircraft. The MRP RLM 74 was added to the wings and fuselage spine, then mottled on the fuselage. The masks were next removed, and any touch-ups were done as needed at that time. When you add this bit of color, the model positively comes alive! The decals for the markings of this aircraft were sourced from my extensive decal collection; everything I need was there to complete it accurately. The trick was to get the proper dimensions for the Technical Officer chevron and circle marking.

"When done, the photos were sent to Mike to use to have the actual completed airplane painted. At first the fuselage had been painted up, but I took exception to how it appeared after that first attempt. I mentioned that the 'clouds' were too sharp and distinct. The real thing would be much more soft-edged in application and appearance. To my absolute delight, Mike and his team went back and repainted it to give it the perfection it deserved! The wings and tailplanes looked just perfect to me as-is. No rework required there, even with their unique, difficult-to-replicate camouflage scheme. The stencils were perfect as well. Then they sent me a picture of the whole thing put together, and I noticed a very distinct line from the supercharger intake to the nose on the left-hand engine—access panel. That was not right. It was an interpretation error on what the paint master showed. The engine panels had not been installed when I looked at the previous photos. I mentioned that it bothered me and should be fixed. In the name of perfection, the team went ahead and repainted that as well. Now, when I saw the results it was exactly as I thought the original airplane looked — absolute perfection! This is exactly how the Erla factory issued this airplane to JG-54 in 1943, and I am humbled and proud to have been a very small part of this restoration. The final result is absolutely perfect." Such was the effort expended in getting the paint scheme correct. Anything short of that would not have been an acceptable result. Just ask those Internet experts!

Clockwise, from above: The unique MG 131 13mm machine gun ammo drum bulges characteristic of the G-6. In this case, however, the right bulge also incorporates the pressurization vents, bumps, and scoops originally intended for the pressurized Bf 109G-5 version.

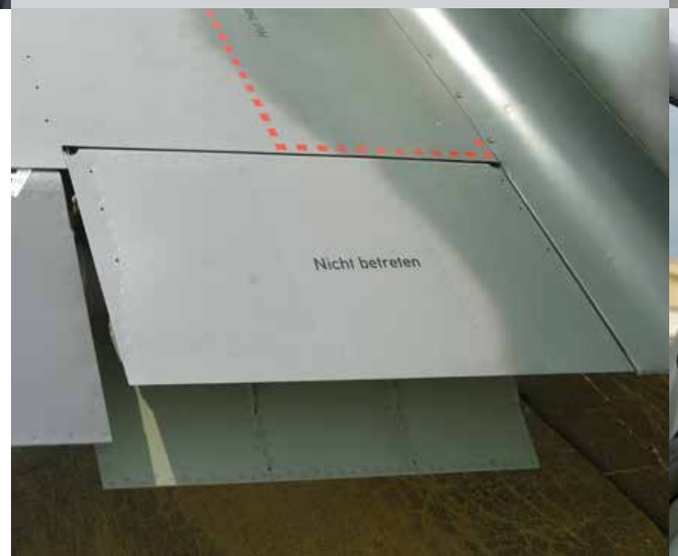
Detail of the markings applied to the aircraft, accurately replicating that of the aircraft assigned to the Technical Officer of JG-54, *Grunherz.*

The moveable portion of the canopy incorporates armor plating for the pilot, and as such, is quite weighty and can be a handful to operate.

"Dazzle" markings on the spinner were a Luftwaffe standard applied item.

All markings were researched and applied in their proper locations, including all operating and servicing stenciling.

Mike Vadeboncoeur confers with owner Bruce Winter following some early ground runs/taxi tests.



POWERING THE *GUSTAV*

Foreign aero engine guru Mike Nixon, whose company, Vintage Aero Engines, had rebuilt the DB 605, had been on hand to successfully conduct the first engine runs, which were successfully performed beginning on November 16, 2021. More runs would follow the next day, and other than some minor adjustments all went well, meaning the day would draw near when this stunning aircraft would finally fly again. To keep a watchful eye on his masterpiece, the beating heart of the aircraft, he would be on hand again to witness that first flight. He told *Warbird Digest* not only of his involvement with this project, but also of his background rebuilding German aero engines from the World War Two period: "I started working on the DB engines back in 1995. The first was a 601 for David Price, and that aircraft started flying summer of 1999. Since then I have done three more 601s, three of the DB 605s, two BMW 801s, a Jumo 211, and I'm currently finishing up a Jumo 213. We have translated manuals for all of them, and also made the tools needed for all of them."

Vadeboncoeur added to the engine conversation: "Of course the DB is an inverted V-12, and it is a fuel-injected, supercharged engine. The beautiful whine you hear on the 109 comes from that supercharger on the left-hand side of the engine. The cylinders are held in by large splined nuts that you access by removing a large plate that bolts to the top of the engine. Mike had to a make a multitude of special tooling to disassemble and reassemble the complex engine." Parts availability seems to vary on what you are looking for. Thankfully, some items are being reconstructed in Europe like accessory cases and nose cases, and some gears. As the popularity and need of various engine parts arises, someone typically will step up and fabricate them as needed. Only one engine was used to rebuild this unit." We had a new nose case for the prop reduction gears fabricated and fitted by Rinner Performance Engines in Austria. Also, a new lower rocker cover that was made new by Hubert Hartmair's company in Germany.Ten hours of test-stand time was completed before we installed it into the airframe."

FLYING THE *GUSTAV*!

Warbird Digest contacted test pilot Steve Hinton in order to get his impressions on the aircraft, test-flying it, and his thoughts on the quality of the restoration. Hinton had nothing but praise: "Bruce, who is my friend, had contacted me some time ago about doing the first flights on the 109 when it was finished. I told him to let me know when it is close to being ready, and I would then come out and take a look at it. I've watched Vadeboncoeur's work through the years, and it is top-notch, high-quality work. I have been greatly impressed by them [Midwest Aero] and their attitude towards restoring these aircraft. They are very knowledgeable in what they do. So I knew there wouldn't be any problems. I was adding them up the other day, and I've done 73 first flights in restored or rebuilt aircraft. That isn't test flights after major maintenance, or an engine change or something...first flights since having gone through the complete process of being built from a pile of parts on the floor. Only twice have I had what I would call "eye-opening" experiences. I don't need to do all the ones people ask me to do, and I don't. They did a wonderful job on this 109, and I don't think there is one better anywhere." That should give the reader an idea of how much Hinton trusts the work performed by Mike and his team.

Hinton continued: "I'd previously had experience flying the Air Museum's Buchon, with 30-plus flights in it. I actually ground-looped it while filming scenes for the *Pearl Harbor* movie in England. We had modified it with Bell P-39 Airacobra brakes, which work good, but on my third flight that day I had put the gear down and pumped the brakes to see what I had, and there was nothing from the right brake pedal — it was dead! Most of the time you need to use brakes for direction control on landing the 109 — with only one brake, I lost control and damaged the airplane. Nothing I could do. So I brought it in, coasted along, and shut down the engine. That particular airframe has been ground-looped a lot through the years, and I think it may be something peculiar to it. I've also flown a genuine Bf 109E, having done the test flights on Paul Allen's *Emil*.

"The 109 has a busy, tight cockpit that is pretty simple, except maybe for all of the German writing, and the instruments that read in metric. It's a small little airplane, and when you're in it you know you're in a fighter! Being a historian, I always get a kick out of doing this stuff. After our first attempt to fly was thwarted by fouled plugs, I returned for the second time, and it couldn't have went any better. I flew it for about twenty minutes — nothing fancy, just wanted to see what it would do at normal cruise power settings. All I did was take off and orbit the field for a bit to make sure it didn't fly sideways or anything, and keep an eye on all of the pressures and temperatures. The Red Line brakes felt really natural and were a big improvement. Again complementing the mod to use redline brakes on this new 109 was a great choice. 33,000 109s were built in World War Two, with 13,000 landing accidents recorded. In other words, the 109 can be a tricky machine to land by design, regardless of who is flying it. Other than an issue with the oil scavenge system, which Mike Vadeboncoeur quickly found and rectified afterwards, it went great! There had been some excessive oil blowing out of the breather, but this was traced down to a gasket in the oil scavenge pump later on and fixed."

In order to prepare owner Bruce Winter to fly the 109, Hinton gave him a once-over in an NAA T-6 to check him out: "Bruce is a great pilot. Besides his Navy time, he has flown a bunch of other stuff with tailwheels, along with the 1,000 hours or so he has in P-51s. He'd never flown a T-6 before, and Butch Schroeder was kind enough to loan us his for a checkout there in Danville. Even though he had never flown the -6 prior to our flight, he handled it just fine, no matter what I threw at him. I knew he could handle just about any taildragger and would be just fine."

A DREAM NOW REALIZED

Now that the aircraft has flown, and Winter has had the opportunity to sample it himself, *Warbird Digest* asked, what his thoughts were? "Mike and Dave and Steve are my good friends. The Messerschmitt 109G-6 project was our project together. We all love World War Two fighters, and just have to restore and fly them — it is work and a job, but it is also our hobby, passion, and where we like to spend our time. So I met Mike and Dave twenty years ago, and we had such a

Opposite: The accurately restored instrument panel within the tight confines of the Bf 109 cockpit

good time restoring and flying the Mustang that if good luck and opportunity should present itself again for a worthwhile project, we were all in. The reasoning behind the restoration of the 109 was not an overly complex and tortuous story: simply we all thought it would be very special to be able to fly the main two adversaries in the World War Two European Theater. Mike and Dave were enthusiastic to try and restore a new airframe, and we all thought that the 109 was the most well-known and iconic fighter of all the Axis fighters, and it just looked mean and lethal. We of course strongly believed in an authentic restoration of a war veteran to include the Daimler Benz 605A V-12 fuel-injected supercharged engine.

"I researched all the available projects, and by happenstance this veteran from the war was pulled out of a lake in Estonia in the '90s after it went down fighting on the Eastern Front in February 1944. After changing hands several times it became available in Munich. Me and Mike and Dave went over to take a look, and Mike Nixon happened to be over there at the time and looked over the DB 605 and we all agreed we had an excellent authentic veteran to restore. The challenges of this project were daunting; whether we realized them is a good question. To name a few, all printed help was in German, no significant numbers of previous restorations of authentic G-models, chasing for authentic parts when needed became more than a pastime, and the rarity of engine parts was even more acute. Mike Nixon did wonders with the engine, translating all the German engine manuals to help with the engine rebuild. Mike and Dave and Steve built all tooling from scratch.

"My five flights have been just fantastic! Steve Hinton test-flew her on the first flight, doing a great job. She flies really well. My bullet impressions are: accelerated well; very fast; rolls quickly — the push/pull tubing for controls helps — elevator effective but stiffens at higher speeds; very yaw-axis-sensitive, needing constant readjustment with any slight changes in roll or pitch or power more so than the Mustang. They are definitely different — Mustang/109 — but there is six years in aeronautical engineering development between the 109 first built in 1935 and the Mustang. The 109 is almost the smallest fuselage and wings you could wrap around a 35-liter DB engine (kind of like the 427AC Cobra from 1967). The 109 is at least 2,000 pounds lighter, with five feet less wing! But it is 50mph slower than the Mustang in the low 20s!

"She behaves nicely when you pay attention to what all the old experts advise and operate her in very benign conditions. I have been fortunate to have learned a great deal from all the old hands and treat her gently under perfect weather conditions to safely gain good flying experience. While I have no reservations to doing another restoration project with my friends, however, of course we are not near done exploring our 109 just yet!"

Warbird Digest posed the question to Vadeboncoeur of what it has meant to him and Midwest Aero Restorations to be involved in this monumental undertaking and the satisfaction it surely brings to everyone that has had a hand in it: "Interesting question you should ask... Back in 1993, I was asked the very same question by the late Paul Coggan after we finished *Lil' Margaret* with Butch Schroeder: 'Now that you've finished *Lil' Margaret*, how do you top that?' I have always felt we could do better on our airplanes over the years, and we strive to improve the work we do on each one that goes through our doors. With this 109, however, we didn't really have any idea how well we could achieve an authentic restoration of the type. Limited parts availability and resources were all things that we thought might be obstacles to achieve what we were trying to accomplish. However, over time, we have been able to source parts and gain friendships around the world that have enabled this project to be what we believe to be the most authentic flying 109 in the world. When we started this project, at times I thought, 'Are we *ever* going to get it done?' Now that we are done, it's actually a bit surreal and hard to believe. Even after the first flight, while we were elated, it still didn't seem real that we actually have such a rare piece of German World War Two history over the heartland of the United States. That likely hasn't happened in the Midwest since performance-testing of captured World War Two German aircraft during the war by the USAAF at Freeman field in Seymour, Indiana, a scant 120 miles from Danville. Really remarkable to think about."

Project Manager Young had this to say: "It has been an honor to be part of such a rare piece of history. This has been both a challenging and a rewarding accomplishment. It is always fun to work with Doc on projects like this. His desire to return this plane to the air, and in its original configuration, should be commended."

Schultz added, "When I first saw this project, it looked like an almost impossible task and I wondered why anyone would want to undertake such a challenge. But when you just look at one little piece at a time and, about eight to ten years, the next thing you know you have an airplane! It has been a privilege to work on such a piece of history, and I think the project turned out very well in terms of originality and quality. Seeing it fly for the first time since its demise in 1944 was quite a thrill."

No effort was spared in making this restoration as original and authentic as possible. This came down to the dedication of the owner's investment in seeing that happen, and trusting in the right people to get it done. Of his relationship with Dr. Winter, Vadeboncoeur had this to say: "Bruce has become more than a customer, but a very close friend. He has always displayed tremendous enthusiasm for not only the Mustang, but the 109 as well. The 109 project, like many others, had its ups and downs, and his determination and enthusiasm carried us through on many occasions. Much like the Mustang *Happy Jack's Go Buggy*, his goal from the beginning was recreating an authentic 109 to enjoy and compare all of its documented qualities against its nemesis the Mustang, of which he has nearly 1,000 flight hours in. It has been a pleasure to work with him, and we would certainly entertain other projects with him in the future. As long as it's not German! Lol."

Clockwise, from top: Caught in the flare for landing following an early test flight, Bruce Winter brings the Bf 109 back onto the runway at Danville.

Steve Hinton and Bruce Winter are all smiles following the first successful test flight of the aircraft. *Mike Vadeboncoeur*

Luftwaffe and Bf 109 modeling expert Floyd Werner built this highly accurate 1/48-scale model of the Bf 109 for Midwest Aero to use as a painting pattern, in order to recreate the original paint scheme as accurately as possible. *Floyd Werner*

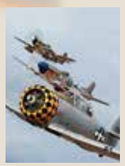
The Bf 109 creates prop tip vortices on another early-morning test flight at Danville.

REBIRTH

VERMILION REGIONAL AIRPORT RESIDENT MIDWEST AERO RESTORATIONS HAS BEEN PRODUCING TOP QUALITY AWARD WINNING RESTORATIONS SINCE 1993.

After time spent being mentored by Henry "Butch" Schroeder on the restoration of the F-6D Lil Margaret, newly founded Midwest Aero Restorations first ground up project was for Ken Wagnon, restoring Cripes A Mighty IV, which received the 2002 Grand Champion WWII Warbird award.

In 2004 Midwest Aero turned out their 3rd Mustang Daddy's Girl after a three-year restoration. Daddy's Girl won the Reserve Grand Champion WWII at Oshkosh. Two years later Midwest Aero rolled out Red Dog for Dan Baun, featuring modern radios and avionics and was restored as a 'sport Mustang' rather than an authentic one, winning the 2006 Reserve Grand Champion WWII award.



What sets Midwest Aero Restorations apart is attention to detail and authenticity, and of course with no compromise in quality.

AWARDS

EAA AirVenture Snap-on Tools Gold Wrench Award:

1990 2006
1993 2008
1996 2010
2002 2011
2004 2013

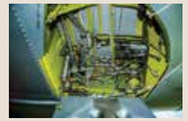
EAA AirVenture Snap-on Tools Silver Wrench Award:

2009 & 2019

National Aviation Heritage Invitational Neil A Armstrong Heritage Trophy Award Winner:

2007 & 2008

The restoration of Happy Jack's Go Buggy as a purely stock Mustang in combat configuration down to acid etched metal panels, lacquered water slide decals and grease pencil marks once again changed the conversation on how a P-51 should be restored.



The level of detail incorporated into each restoration is readily apparent. All the aircraft completed by Midwest Aero Restorations contain the same depth of work, even in spaces that will likely never be seen again.

While specialists in the P-51 Mustang, you can also find the occasional ultra rare combat veteran such as this 1943 ME Bf 109 G-6 , shot down in 1944 and submerged in Lake Swiblo on the Estonian-Russian border for 46 years.

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MIDWEST AERO RESTORATIONS

RESTORATION HIGHLIGHT IMAGES BY MIKE VADEBONCOEUR











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