



Oct/Nov 2021

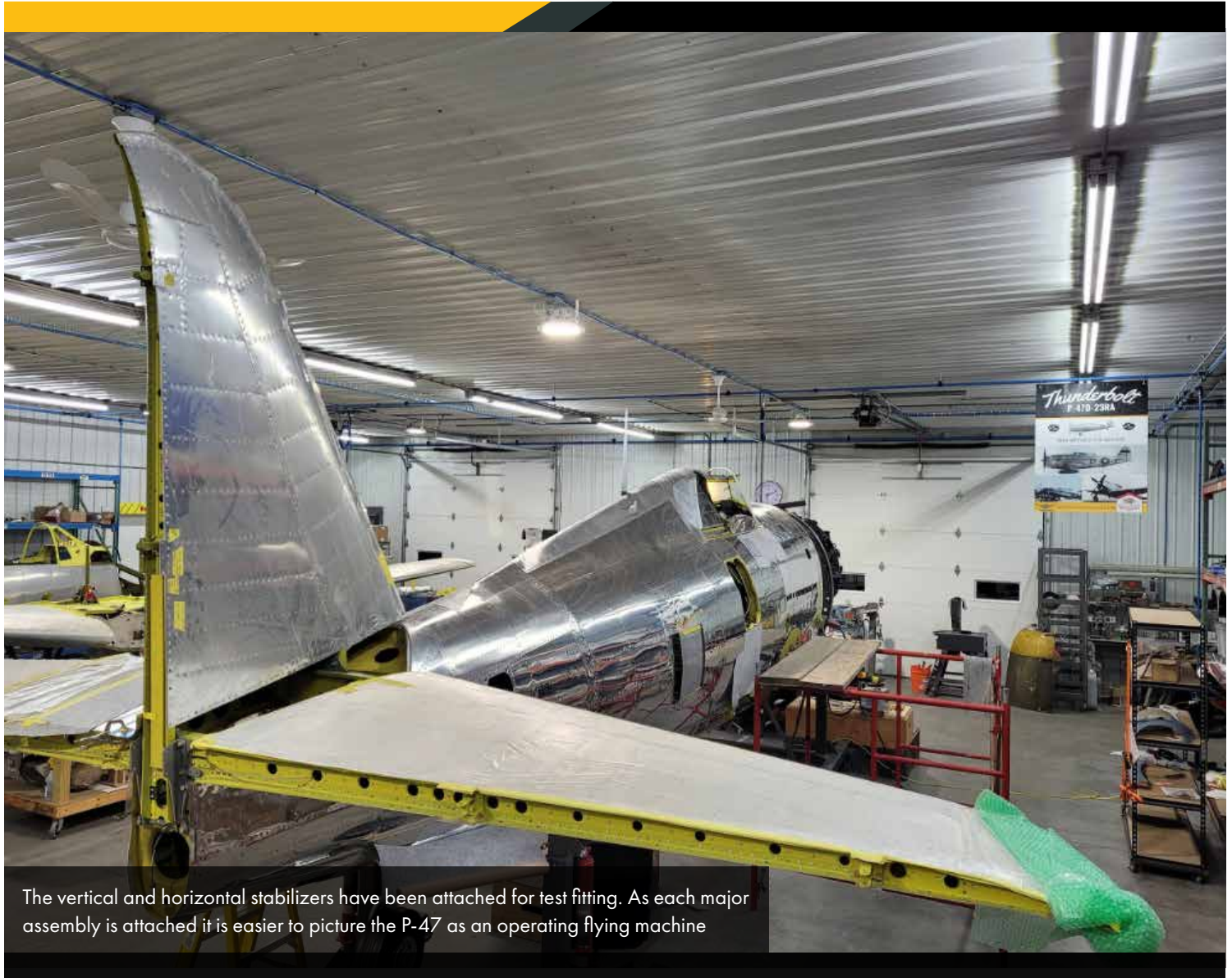
OCT/NOV

Dakota Territory Air Museum's P-47 Update

by Chuck Cravens



AIRCORPS AVIATION



The vertical and horizontal stabilizers have been attached for test fitting. As each major assembly is attached it is easier to picture the P-47 as an operating flying machine



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Update

This month work progressed on the firewall forward area, turbosupercharger system, rudder, flaps, landing gear, and cockpit enclosure.

We will also revisit our meeting with Kermit Bjorlie, WWII P-47 and P-51 combat veteran who passed away on December 1, 2021.

Firewall Forward

Much of the firewall forward work this month was focused on accessory installation and the control linkages for those accessories.



More work on the exhaust manifolds was completed.



The right side manifold section shown here exits into a duct leading to the waste gate and on to the turbosupercharger.



The left side also flows into a wastegate.



This close up shows good detail of how the manifold is welded together.



The manifold connection to the exhaust ports on the engine cylinders is shown here.



One of the engine accessories is the generator, the black cylindrical part in the left center of this image.



The oil cooler mounts have been finished and the oil coolers permanently installed.



The starter has been installed.



One of the larger components found in the accessory section is the main engine oil tank, the olive drab cylinder in the center of the photo.



The oil filler neck and cap are visible in this picture of the oil tank.



The yellow bell crank in the center of this image is part of the control linkage for the waste gates.



The waste gate shown here is in the position that would bypass the turbosupercharger system. It opens and closes to regulate the exhaust gas pressure to the turbosupercharger. It's purpose is to control maximum boost.



Here is a close up of the waste gate partially closed.



The connections to the generator relay and voltage regulator have been made.



This is the vacuum pump mounting pad.

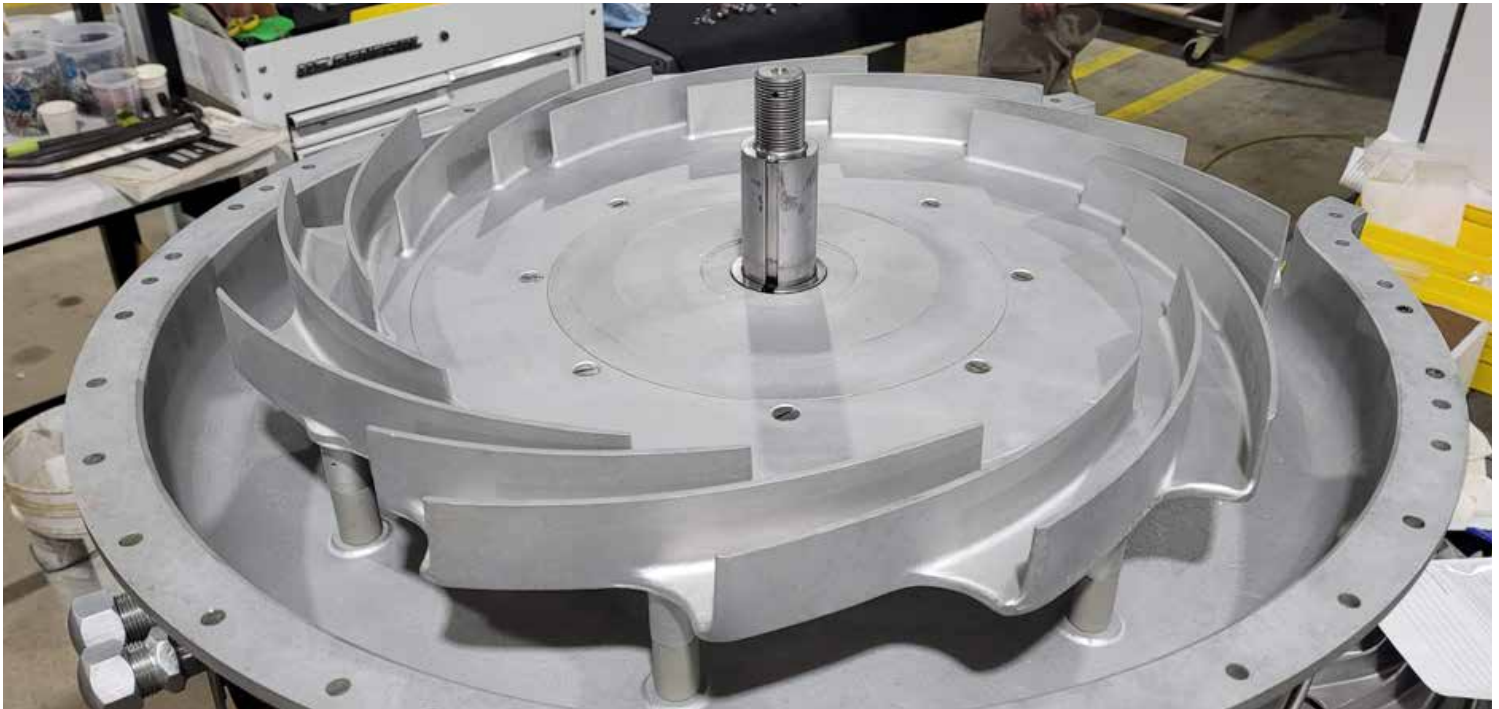


Turbosupercharger System

Perhaps the most complicated and certainly the most unique system in the P-47 is the turbosupercharger system. A great deal of time has been spent on getting it just right.



The compressor wheel (or impeller) is ready for installation in the turbosupercharger housing.



The stationary vanes on the General Electric C-23 turbosupercharger diffuser are mounted in the casing. Air enters the impeller at the center and is discharged radially at the ends of the blades with high velocity energy. The diffuser converts this energy to pressure energy. The casing collects the pressurized air for delivery to the engine induction system.



The lower section of the turbosupercharger is assembled.



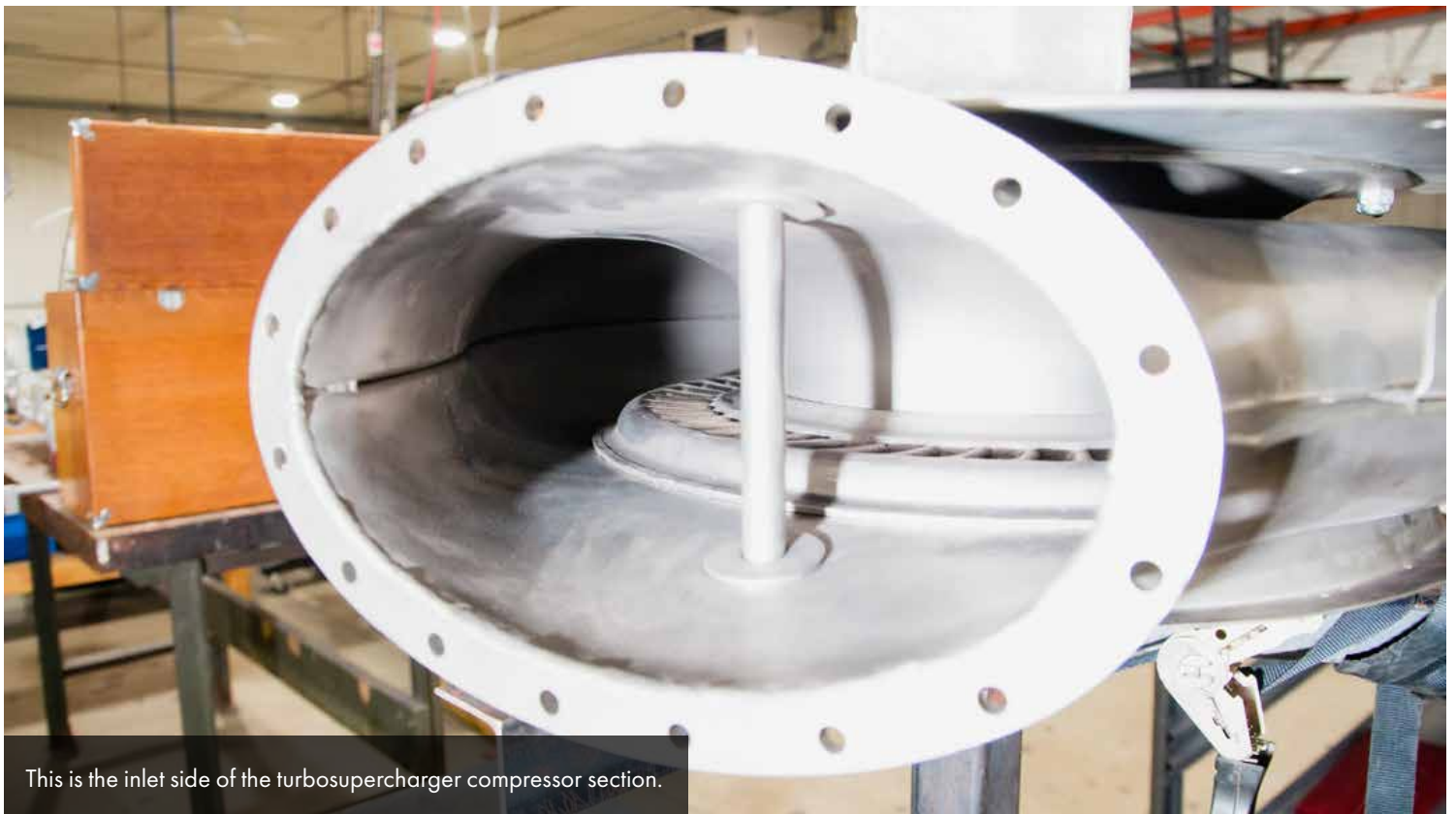
Straps are used to position exhaust ducts as the permanent mounting brackets are fitted.



This ducting component divides incoming air and passes it on to the intercooler and turbosupercharger inlets. After the air is compressed by the turbosupercharger, the duct passes it back through the intercooler to cool it before it is sent on to the engine.



The complexity of the ducting is clearly visible here.

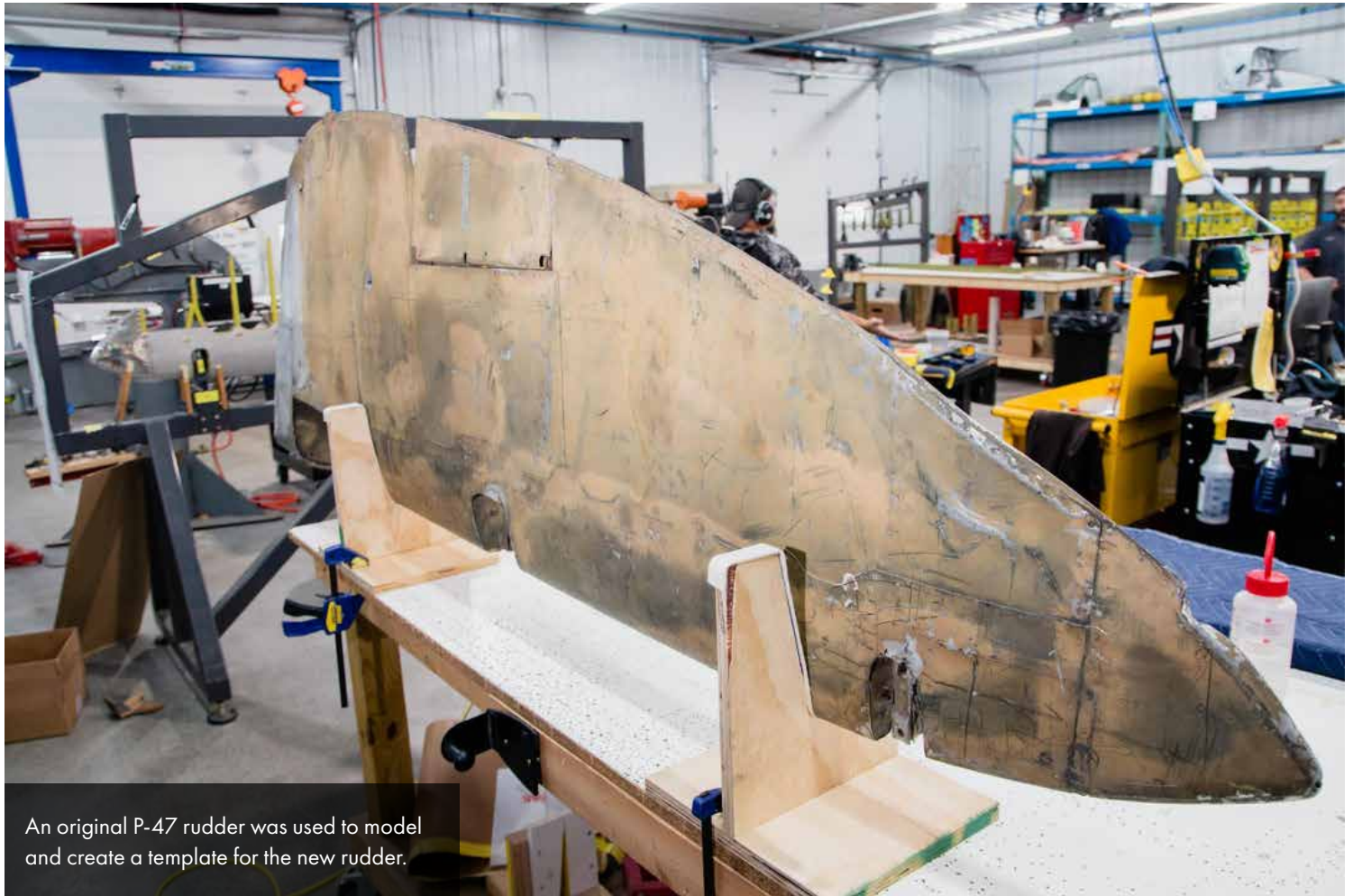


This is the inlet side of the turbosupercharger compressor section.



Rudder

The rudder requires some complex skin forming, especially near the bottom as it fairs into the rear of the fuselage.



An original P-47 rudder was used to model and create a template for the new rudder.



The lower section of the rudder, closest in this photo, is a challenge to form as it expands to match the rear of the fuselage.



The new rudder in the same position as the original template rudder shows the complex lower skin area.



Randy ponders the best way to go about riveting in some of the tight spaces within the lower rudder.



Brad works with Randy at riveting the lower rudder skin.



Landing Gear

Detail work on the landing gear and fabrication of the gear doors were areas of focus this month.



This is the left wing with landing gear in retracted position.



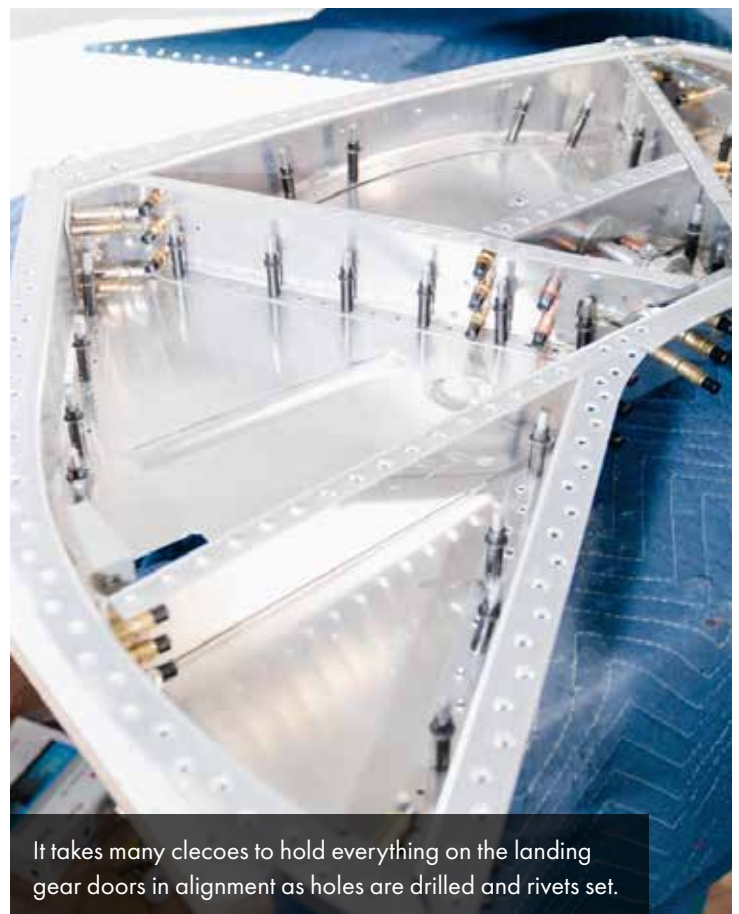
The right wing landing gear is at the same stage of restoration.



The upper end of the compression rod, also known as the shrinkage strut, attaches to the landing gear bearing box and is visible in the lower left of this photo.



Mark works on fabricating the lower landing gear door.



It takes many clecos to hold everything on the landing gear doors in alignment as holes are drilled and rivets set.



Flaps

Cory is making good progress on the flaps. Walkway stiffeners, lower skin support structure, and fitting of skin sections were all areas of progress this month.



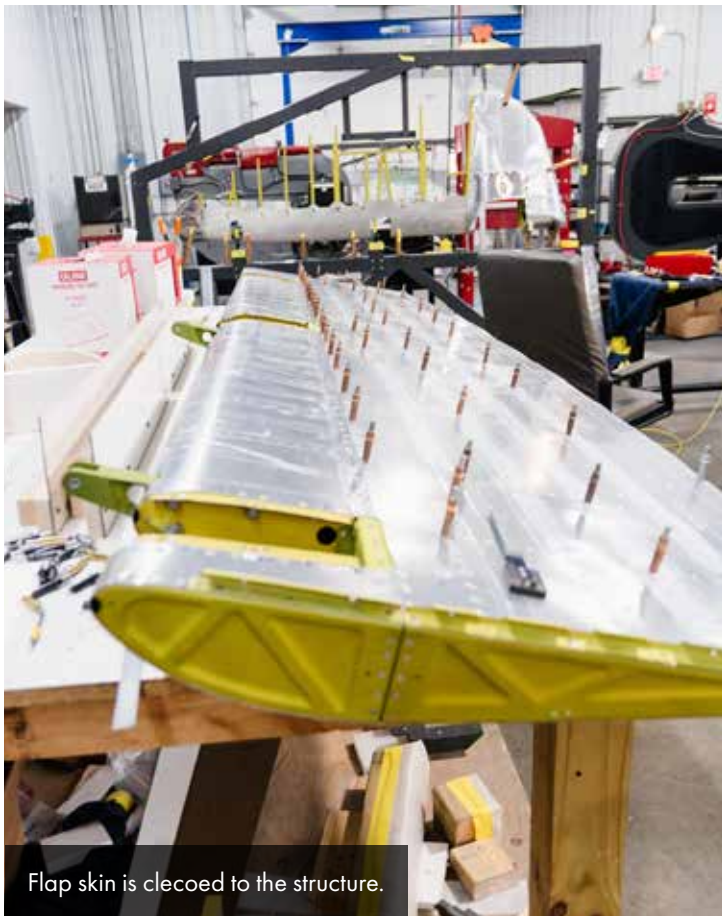
Cory works on the flaps.



Cory prepares stiffeners that support the walkway on the flaps.



The walkway stiffeners are shown here in place on the interior of the flaps.



Flap skin is cleced to the structure.



This image shows the lower flap skin with the stiffening structure that is spot welded to it.



Cockpit Enclosure

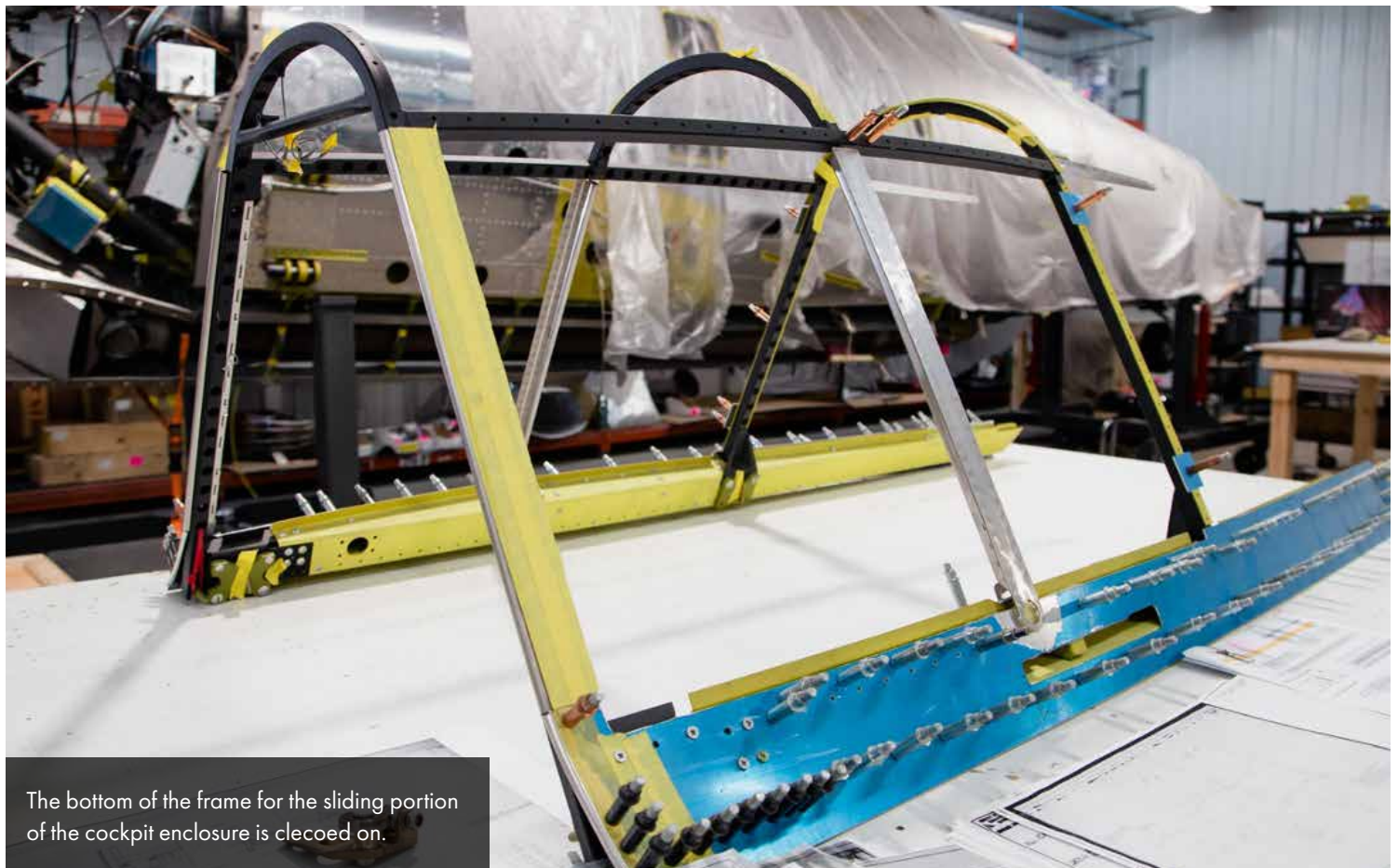
Work on preparing the cockpit enclosure for installation resumed with progress on the windshield and sliding enclosure frames this month.



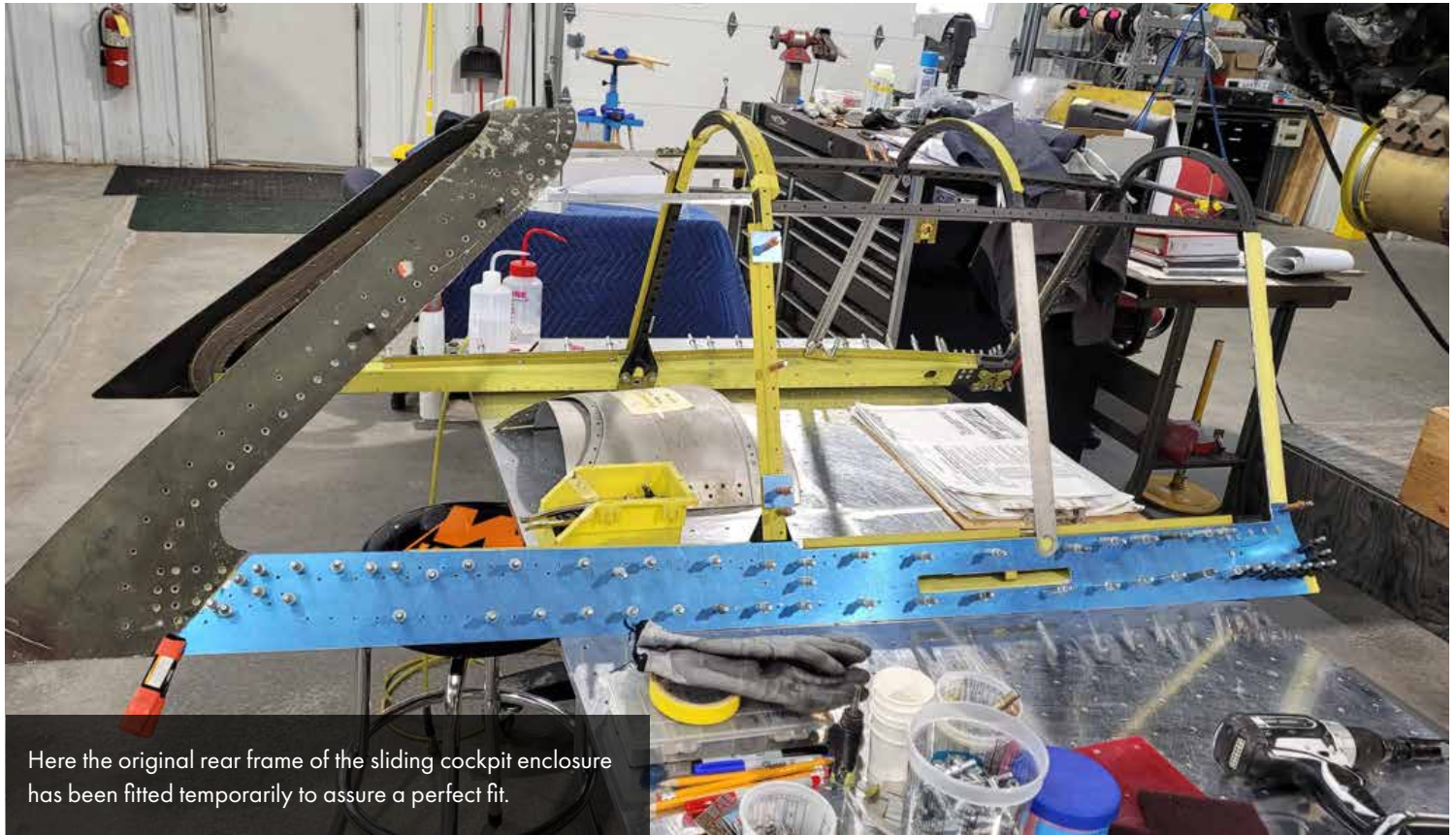
The top section of the windshield is being fitted to the frame and side panels.



The windshield as it looks in place on the fuselage.



The bottom of the frame for the sliding portion of the cockpit enclosure is clecoed on.



Here the original rear frame of the sliding cockpit enclosure has been fitted temporarily to assure a perfect fit.



Another Greatest Generation Pilot Leaves Us

As I write this update near the 80th anniversary of the attack on Pearl Harbor, it is hard not to think about those who gave the ultimate sacrifice to their country that day. At this time of year it is also fitting to remember one of the greatest generation who has recently passed on. While not a Pearl Harbor survivor, Kermit Bjorlie served his country with honor, and we remember him fondly.

Kermit Manfred Bjorlie, 102, died peacefully in his sleep in Zumbrota, MN on December 1, 2021. He was a very kind, reserved, tough, and resilient (stubborn Norwegian) man who loved life and wasn't ready to leave. He was interested in people and loved hearing their stories. He was a man of God, active in his church, and delighted in his family.¹

In the summer of 2019, thanks to his son Jon, I had the great honor of meeting and interviewing Kermit Bjorlie. He graciously signed an access door of the Dakota Territory Air Museum's P-47. It is a good time to revisit that event, and remember Kermit's story.

Kermit Bjorlie Interview 7-13-2019



Kermit Bjorlie Meets Lyle Bradley, two WWII vet fighter pilots!

¹ Excerpt from obituary, courtesy of Jon Bjorlie



I met Kermit Bjorlie and Jon, at AirExpo at Flying Cloud Airport in Eden Prairie, MN on Saturday July 13, 2019.

At that time, Kermit, a veteran of the SW Pacific Theater in WWII was 100 years old. Kermit flew P-40s, P-47s, and P-51s during his training and his combat tour.



Bjorlie was born on April 3, 1919, on a farm in Pekin, North Dakota, about 95 miles northwest of Fargo. Kermit graduated from North Dakota State University with a degree in agricultural engineering. Bjorlie was involved in the ROTC program at NDSU, and enlisted in the Army Air Corps in February 1943 after graduating. He served from 1943 to 1946.



Kermit Bjorlie in 1944, photo courtesy of Jon Bjorlie



Kermit's military identification card, photo courtesy of Jon Bjorlie

Kermit Bjorlie completed primary, basic, and advanced training in several states, including Michigan, Texas, Louisiana, and New Mexico. A training incident at **Fort Sumner Army Air Field** (Sumner, New Mexico) was one Bjorlie wouldn't forget. In May of 1944, he was playing follow the leader when his flight leader went into a very steep climb. Kermit lost too much airspeed following him and stalled in a nearly vertical attitude. His P-40 fell into an inverted spin, definitely a prohibited maneuver in the Warhawk. Kermit was able to get the nose down enough to break the spin with the rudder, and he recovered after gaining enough airspeed.

In April, 1945 Second Lieutenant Bjorlie was sent to Nadzab, New Guinea for jungle flight familiarization. Enroute to Hawaii, somewhere over the Pacific, he learned of the death of President Franklin D. Roosevelt.

The Nadzab Airport is located East of Nadzab Village and was the site of the only Allied paratrooper assault in New Guinea on 5 September 1943. It is located about 26 miles west of Lae.

In the summer of 1944, the New Guinea campaign was rapidly coming to a close and westward movement to the Philippines was on the horizon. The 310th Fighter moved to Noemfoor, an island on the western end of Papua New Guinea, then on to Leyte in the Philippines and San Roque Airfield, on 18 November 1944. The nature of the war was island hopping at that stage, and by 22 December 1944 the 310th was at McGuire Field, Mindoro, Philippines. On 8 April 1945 the squadron moved on to Porac Airfield, Luzon, Philippines.

Lt. Bjorlie was assigned to the 310th Fighter Squadron when it was stationed at Porac, and there he flew his first combat missions.



"Flying over jungles and getting acquainted with what we had to put up with moving down."

His daughter, Carol O'Neill, said he flew the P-47 Thunderbolt with combat missions, giving support to U.S. forces fighting the Japanese in the Cagayan Valley hills.

As the war moved closer and closer to the Japanese home islands, Bjorlie and the 310th ended up on the Bolo Strip in Okinawa, flying five- to six-hour missions over southern Japan looking for "targets of opportunity."



"I wasn't a part of any major battles, but we had battles all the time," Bjorlie said in an interview with Grace Zaplatynsk of the Forest City Summit, Forest City, IA.

Bjorlie told me his favorite of the three fighters he flew was the P-47 because it was large, strong, and carried a heavy load of fuel, ammunition, and bombs. In fact, he credits the P-47 with saving his life.

Bjorlie recounted flying a mission from Okinawa to Kyushu where he had to attack a Japanese destroyer making fast "S" turns tight against a coastal cliff.

He dive bombed the destroyer and as he pulled out of the dive bombing run, he passed low over the top of the cliff where an enemy anti-aircraft battery was camouflaged in a shack near the cliff's edge.



Lt. Bjorlie heard the AA fire hit the bottom of the plane and then shortly after, he saw shrapnel holes appear in his wing. He turned and flew back toward the water, not wanting to end up crashing on land occupied by Japanese troops. He figured his odds of survival were better on the ocean, and that he might be picked up by the Navy.

As he evaluated the condition of his Thunderbolt, he determined that the self sealing tanks had worked as advertised and the plane was handling normally. He would try to make it back to Okinawa with his squadron mates.

It had to be a great relief to spot his home air base after the long overwater flight in a battle damaged P-47, but he did, and landed successfully. In his Forest City Summit interview, Kermit stated "I never did see the airplane again. I think it was taken into the repair depot because it had too much damage." He also observed that this was the closest call in his military flying career.

On Okinawa, Kermit recalled surviving the typhoon that hit the Third Fleet with 50- to 60-foot seas, sustained winds of about 115 mph, and gusts probably up to about 150 mph on June 2 and 3, 1945 east of Okinawa. This typhoon damaged 33 ships and destroyed 76 airplanes, mostly on the flight or hanger decks of aircraft carriers after the airplanes broke free of the chains holding them down.

Lt. Bjorlie weathered the typhoon in a Japanese cemetery under half a tent (shelter half) spread over and tied down to the urns in the cemetery. He said the planes at the airfield were lifting off and "flying" on their tie downs.

As Kermit recounted his war time flying career, he got a bit emotional as he told me that one of the saddest days of the war was when he was part of a ferry flight to take the 310th's war weary P-47s to Clark Field. On the way, the squadron hit towering cumulus clouds and had to "climb to daylight". Turning in his beloved Thunderbolt was a hard thing for Kermit.



Kermit meets WASP reenactor Danielle Hemmingsen at AirExpo 2019.