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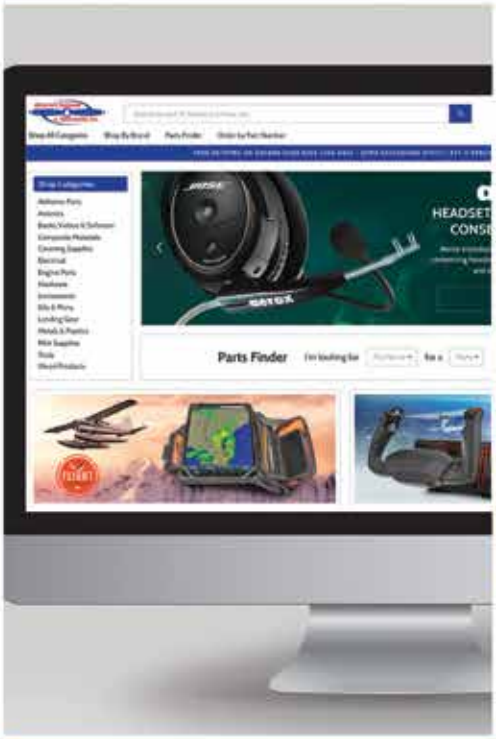


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April 2023

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The View from Here
Jennifer Dellenbusch

Spars and Spares

THIS MONTH, I WANT TO TALK about one of the most unpleasant of aviation topics; Airworthiness Directives (ADs). Although everyone understands the need to be alerted to dangerous or potentially dangerous conditions, no one wants their Piper to be the subject of an AD.

ADs often deal with circumstances where the risk is low, but the stakes are high.

Nowhere is this more apparent than with the Piper wing spar AD. We only know of two incidents (low risk) where corrosion in the spar caused a Piper PA-28R Arrow wing to fall off, but the effects of that were catastrophic (high stakes).

We recently worked with AOPA to distribute a survey to aircraft owners who are affected by the wing spar ADs. One unsurprising takeaway from the survey results is that owners are very concerned about the availability of replacement spars. Here at Piper Flyer Association (PFA), we are well aware of the shortage of replacement parts.

It does seem discouraging but I'm not one to easily give up. I know the AOPA and EAA are actively working to find solutions to these problems that don't just end up grounding the fleet. PFA supports these efforts and we are doing what we can as well.

I would really like to hear from you. Are you affected by the wing spar ADs? Have you performed the eddy current testing? What was the outcome? What are your concerns? And finally, what can PFA do to help?

Blue skies.

Jennifer Dellenbusch

To read more about the AOPA survey results, go to:
tinyurl.com/aopa-spar-survey-results

Letters to the Editor

Send your letters to
editor@piperflyer.com

Is Your Airplane Lying About Its Weight?

Steve Ells
March 2023

Editor,

It was interesting to read Steve Ells' article about weighing an airplane. And I'm glad you provided information on how much passengers weigh—I don't like having to ask them! LOL!

Regards,
Tom Fogerty



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Continued from Page 10

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Sywell, United Kingdom

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aeroexpo.co.uk

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Right #1 .....U1235-01.....**$295.00**
Inboard Aileron Bay Rib,
Left #7.....U1236-02.....**$136.02**
Right #7 .....U1236-03.....**$145.47**
Outboard Aileron Bay Rib,
Left #15.....U1236-04.....**$185.93**
Right #15 .....U1236-05.....**$136.02**
¾ Rib, Left or Right #14.....U1237-06.....**$134.26**
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The Money Pit

It's OK to talk about how flying is challenging—and expensive.

"Too many people spend money to buy things they don't want to impress people they don't like." **– Will Rogers**

One of the dumber things people say about flying is: "If you have to talk about how much it costs, you can't afford it."

Flying costs money, or it costs time. It usually costs both. There is no getting around the fact that aviation, like any worthy endeavor, requires that you give something to it before it can give something to you.

The cost of aviation has hit home to me recently as I search for an aircraft fast enough to get out of its own way. I love my little taildragger, and the 87-knot cruise speed of my plane is OK on most days, but I occasionally want to go somewhere quickly. Its cruise speed, which is equal to the speed at which I used to stow the reversers and exit the runway when I flew jets, is often too slow for serious travel.

For example, this week, I had a chance to fly to Fredericksburg, Maryland, to visit with an old AOPA buddy. It has been windy, as it often is this time of year. My trip there from my home airport in Kentucky, according to ForeFlight, would take 2 hours and 30 minutes, courtesy of a 61-knot tailwind.

The trip home, however, would be insufferable. My 87-knot cruise speed, minus the forecast headwinds of 61 knots, would result in me cruising at just 26 knots over the ground, and would take 13 hours of flight time. I could drive my truck—or maybe even ride a bicycle—that distance faster than that.

Money is the answer to this problem. Planning the same trip with a more expensive-to-own-and-operate twin-engine aircraft or fast single would get me to Frederick in 1 hour and 25 minutes with a return flight time of less than three hours.

The price you pay

The monetary costs of learning to be a pilot are easy to quantify. You must outlay a chunk of moolah to get into flying. You pay for every flight or ground training hour, and after enough hours have passed, you are ready to go to a Designated Pilot Examiner (DPE) and spend way too much money for a checkride.

When you became a pilot, your wallet was only beginning to be bereft of cash. You must maintain currency, which means renting or owning an aircraft and flying for at least an hour a month. Required medical exams are not free and are not covered by your insurance. The economic cost of your love affair with flying is genuine, and to say you can't afford it if you have to talk about it is ludicrous.

The price I paid for flying was that I had no existence outside of it.

I have probably spent considerably less money on flying than many of you. I got the employee discount on aircraft rentals and went on free rides at every chance. I have always been around airports and airplanes, and when I began to learn how to fly and get my ratings, checkrides were free if you were brave enough to take them from the FAA.

The time you spend on flying can be the most expensive thing

There was a price to be paid for my love of flying and it went beyond money. It took up all my time, meaning my opportunity cost was very high. Because I was working at the airport and spending all my non-working free time there, I missed out on a few things.

I had no social life outside of the airport. No holiday, including Christmas and family birthdays, was too valuable. I sacrificed them frequently for a chance to go flying or to spend the day working at the airport.

The price I paid for flying was that I had no existence outside of it. To keep the monetary costs of it down, I devoted my life to it.

Looking back, I sometimes joke that I should have used all that time during my youth to make something useful out of myself, but I have no regrets. I would pay that price again, given a chance, because it was worth it.

Military pilots do not spend a dime on more than a million dollars' worth of training. Their "free" training really costs more than most of us pay to be a part of aviation. You can always make more money, but you cannot make more life span.

In addition to flinging themselves into harm's way to defend us, the price they pay can be counted out in years. New USAF pilots must promise to fulfill a 10-year active-duty service commitment that begins after their training, which typically takes a year to complete.

Is it worth it?

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A fat bank account is nice, but you can't fly a financial statement or a stock certificate, no matter how valuable it is.

The two questions

We all have fielded two questions when we are asked about our flying lives by non-aviation people. The first is about whether learning how to fly is hard. The second is always about money. "It must be costly to fly. How do you afford it?" they ask.

I think we usually answer both questions dishonestly. We answer the first by saying that anybody can learn how to fly. Sometimes we are guilty of the sin of comparing piloting an aircraft to driving a car.

I will devote a future column to why telling non-flyers that piloting is easier and safer than driving a car does a disservice to ourselves and aviation. In my opinion, when we answer the question that way, we belittle both ourselves and piloting with false modesty. Learning how to fly is not always easy, and it is not for everyone.

We usually answer the question about money by talking about how inexpensive flying is and how almost anybody can afford to buy and fly an airplane. While this is true, to us at least, maybe we should occasionally answer the money question this way: "Yes, like any great thing, flying can be expensive, and I have spent more than a little money on it that I could have spent on something else."

Maybe the best way to answer either question is to ask that person a question of your own. I have done this more than a few times, and it is amazing how it clears things up for people. It goes like this:

When my non-flying friend asks: "Hey, Kevin, is learning how to be a pilot difficult? Isn't it expensive? I answer: "I am going flying tomorrow morning. Why don't you come to the airport, and I'll give you a free ride? I guarantee you will have fun, and it will answer all your questions."

That, my friends, is the answer. Not only will the ride give your friends a whole new perspective on life, but you may also hook them into being "one of us," and, who knows, someday, they might share the costs of an airplane with you.

Kevin Garrison's *aviation career began at age 15 as a lineboy in Lakeland, Florida. He came up through General Aviation, retired as a Boeing 767 captain in 2006, and retired from instructing airline pilots in 2017. Garrison's professional writing career has spanned three decades. Send questions or comments to editor@piperflyer.com.*





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Q I will replace the engine on my Piper PA-28-236 Dakota at the end of 2023 or early 2024 with a Lycoming factory-rebuilt zero-time engine. I had the prop re-sealed at the last annual, but it has not been overhauled for over 15 years. What other things should I consider doing, if any, when it goes into the shop? Prop, new baffles, any accessories or items related to the airframe? Are there things that I can do to prepare for any of this in advance of the engine change?

Charlie

A Good question. Some items that commonly get overlooked are the exhaust system and the welded steel engine mount.

Considering you had the prop re-sealed at the last annual and returned, that seems to indicate that the prop is in serviceable internal condition. I suggest you contact the prop shop that did the re-seal and ask them for advice on whether an overhaul is needed.

A re-seal order lets the prop shop make the call on the parts that need replacement. In order to re-seal the prop, the hub has to be opened up and the seals changed. If they find wear or corroded/rusted parts while the prop is disassembled, the shop will call to tell you what they found and their repair costs. Or, if there's lots of wear and rust/corrosion, they will urge you to overhaul the propeller.

Regarding engine mounts: I found a hole in one of the lower tubes of the engine mount on my 1960 Piper PA-24-180 Comanche 180, so I removed it and took it up to Loree Air since it was the nearest approved engine mount repair shop.

My mount had so much internal rust they replaced seven tubes to make it airworthy. Other well-known exhaust and engine mount repair and overhaul facilities include *Piper Flyer* supporters Acorn Welding and Wag-Aero. Aerospace Welding is another option.

You'll need to look at the prop governor to determine the last time it was overhauled. If it's also been 15 years since it was last touched, I would get it overhauled, too.

I would also install new flexible engine hoses. Most flexible hoses have a life of 10 years. Search for "Dakota firewall forward engine hose kits" using your favorite search engine to find prices and availability. *Piper Flyer* supporter Aircraft Spruce and Specialty will make up hoses, too. However, it looks like each hose must be ordered individually at Aircraft Spruce.



Those are the big items, and are, in my mind, must-do items when an engine is changed.

Happy flying,
Steve

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While there are several "how to do it" videos on YouTube on repairing and servicing your compass, the legality of a field repair is a gray area.

Q The compass in my Piper PA-28-180 Cherokee 180 started leaking recently, the fluid got on my carpet, and now the compass is dry. Do I have to buy a new compass?
Jeff

A While there are several "how to do it" videos on YouTube on repairing and servicing your compass, the legality of a field repair is a gray area. The videos will show that it's not a difficult task, but according to the regulations, mechanics must have the appropriate manuals for any work performed.

Fortunately, Aircraft Spruce and Specialty sells the overhaul manual, every part, and the correct fluid needed to repair and service an Airpath compass. *(Airpath compasses are commonly found in Piper airframes.—Ed.)*

After it's repaired, you may need to "swing" or calibrate the compass. The detailed procedure is described in Advisory Circular AC 43.13-1B, Section 3. Duncan Aviation has also published a blog entry about the procedure on its website. Links to both are in Resources.

When I rebuilt the panel of my Comanche, I chose to replace my Airpath compass with a SIRS 2400 compass. It's an expensive unit, but I believe it's an improvement over the Airpath compass. I bought it from Aircraft Spruce and Specialty.

Happy flying,
Steve

Q I have a Hartzell two-bladed prop on my Piper PA-24 Comanche. My mechanic says he can't find the correct grease to lube it with, and that if I can't come up with the right grease, it will technically be unairworthy. The service manual calls for putting in grease every 100 hours or every annual.

What is this about? How can it be that he can't find any AeroShell grease? AeroShell grease can't be that hard to find.

Can I use any other kind of grease?
Bobby

A On June 14, 2021, the Chemtool plant owned by Lubrizol in Rockton, Illinois, went up in flames. That plant produced much of the grease sold and used in the United States, and this explains the extreme shortage of AeroShell Grease 6, the grease that Hartzell has specified for your propeller.

I heard rumors that the shortage severely impacted commercial operators because (unlike you and me) they must comply with

continued on Page 62 »





California Dreamin'

Is that a Mirage on the horizon, or is it a mirage?

In the quest for a next airplane, many factors must be considered. My previous ride, a sweet Piper PA-28-236 Dakota, was a wonderful machine that my partner and I did not use to its full potential. In my case, the reasons were primarily twofold: time and weather. I either had the time, and the weather wasn't great, or vice versa.

Weather concerns

Living in this part of the world—the Atlantic Provinces of Canada—often makes weather an issue. For slightly more than half the year, IMC also can mean icing. Low visibility is also a factor. There is a good reason that pilots that spend some of their careers in this part of the world are often highly valued.

Aside from Alaska, there are few places where you can get exposed to so much extreme weather in a short period. All four seasons make themselves known here in spades. Wind, ice, fog, turbulence, rain, and snow; all in one flight!

Don't get me wrong; it can be stunningly beautiful for VFR flying here any time of the year, too, notwithstanding the temperature. Nevertheless, there are times a light IFR airplane is hangar-bound (or should be) when more capable machines could make the flight. What fits this mission profile?

No, I'm not contemplating a move to the Golden State to address this dilemma, as the column's title suggests, but I am dreaming, fantasizing, and envisioning a possible future. Perhaps Piper had the Mamas and the Papas in mind when they named their PA-46 design.

First called the Malibu (California reference), then Mirage (see the earlier synonyms that infer dreamin'), Meridian was the moniker chosen for the early turbine models. And, of course, now all are simply known as the "M-Series," with digits corresponding to their respective horsepower.

Aside from Alaska, there are few places where you can get exposed to so much extreme weather in a short period. All four seasons make themselves known here in spades. Wind, ice, fog, turbulence, rain, and snow; all in one flight!

Yes, this is a delusional Walter Mitty-esque dream, but it may not be as half-baked and hair-brained as you think! Allow me to explain.

Higher and faster

I have a pal who is currently the owner of a very nice Cirrus SR22 Turbo. It's fast, at 180 knots, and has the TKS anti-ice system, a Garmin G1000 panel, and XM weather. It's a nice ride. It's in demand. He frequently gets calls from his dealer asking if he wants to sell. He also reads a lot and has discovered that many SR22 owners look to the PA-46 piston or turbine version as their next ride.

The Cirrus Vision Jet is a huge step in cost, complexity, and insurability. Some of us can't or won't make the grade. The Piper M models are a more manageable step up.

Some initial research tells an interesting story. Limiting our examination to the piston-powered versions of the Piper, the price can be more, similar, or less than his SR22, so there are options for my buddy.

Depending on the vintage, at one end of the price spectrum, you would see steam gauges and first-generation GPS units; at the other end, the G1000 suite; and in between, combinations of everything, including autopilots, radars, Stormscopes, and ADS-B connectivity.

From their corresponding websites, both the Cirrus SR22 Turbo and the Piper M series top out at a true airspeed of 213 knots. While both are certified to 25,000 feet, the Piper can be pressurized, so the cabin would only be at 8,000 feet when cruising at Flight Level 250.

You can go all the way to 13,000 feet in the Piper and maintain a sea-level cabin with the 5.5 psi cabin pressure differential, eliminating oxygen cannulas and minimizing the ear popping that you'd have in the SR22.

If range, versus passenger load, is the priority, the Piper is good for 1,343 nautical miles versus the SR22's 1,021. Advertised useful loads come in at 1,308 pounds for the Piper and 1,246 for the Cirrus.

The Piper holds a maximum of 120 gallons of fuel, whereas the Cirrus holds 92. These machines are like many aircraft, where fuel versus passengers/bags is a trade-off, and if you're filling one, you can't fill the other.

The Cirrus Vision Jet is a huge step in cost, complexity, and insurability. Some of us can't or won't make the grade. The Piper M models are a more manageable step up.

Most of the Pipers are equipped with weather radar, maybe even fancy vertical profiling versions, and XM or ADS-B In would be easy to add if not already installed. There is no radar for the Cirrus, so a disadvantage there.

I'll say that anti-ice boots and hot props (Piper) versus TKS for the Cirrus is a wash, as the Cirrus will run out of fuel before TKS fluid. I suppose you would need to replenish the TKS, whereas a boot system requires they be kept in good repair along with the pump and plumbing.

Of course, retractable gear and the pressurization system make the Piper more complex, affecting maintenance costs and, potentially, pilot insurability. Obviously, more research is necessary.

Next steps

If this were to happen, I would be a junior partner in any scenario. Still, my airline time would benefit my buddy, and I would happily ride shotgun with him for whatever period insurance may specify. So, we shall see.

Is that a Mirage on the horizon, or is it a mirage? Stay tuned.

Tom Machum *is a Boeing 787-9 Captain with just over 20,500 hours. He and his wife, Jennifer, live in Moncton, New Brunswick, Canada. His stories are inspired by his flying adventures in both big and small airplanes. Tom also flies a Piper PA-28-236 Dakota for fun, and his articles are inspired by his flying adventures. Drop him a note and he'd be happy to reply. Send questions or comments to editor@piperflyer.com.*





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RECOGNIZING THE SYMPTOMS OF HYPOXIA

Hypoxia (lack of oxygen) is a concern for all of us who operate at altitude. However, not everyone's hypoxia symptoms are the same. **MIKE DAVIS** describes his experience in the FAA's PROTE hypoxia chamber.

For decades, my flying has consisted of cruising in a pressurized cabin at the upper flight levels. Not once did I consider my need for consistent blood oxygen levels. I used oxygen, however, as every pilot is required to don an oxygen mask if a fellow crew member leaves their duty station above FL250; think bathroom break.

This often-neglected rule was considered a chore, as we had to correctly re-stow the oxygen mask back in its tiny panel box after use for it to be regarded as a quick-donning device. The FAA enforced this regulation, and the airline was regularly reminding pilots of the requirements.

Shockingly, these safety regulations were rolled back with the COVID-19 crisis. It seems that pilots do not wish to don an oxygen mask that has been worn by someone else, but I digress.

As a civilian-trained pilot, I never had the opportunity to experience altitude chamber training. I often wondered what my reaction/response would be to a low-oxygen environment. Thanks to the FAA FAAST program, I had the opportunity to see for myself the effects of hypoxia.

Defining hypoxia

Let's start with "what is hypoxia?" The National Transportation Safety Board (NTSB) defines hypoxia as "reduced oxygen" or "not enough oxygen." Our atmosphere is about 21% oxygen and 78% nitrogen.

As our aircraft climb, the atmosphere's composition stays the same, but the partial pressure of oxygen reduces. This means that there is still about 21% oxygen at altitude, but there are fewer air molecules in a given volume of air. In addition, our bodies become less adept at extracting and using it.

Hypoxia occurs when there isn't sufficient oxygen in the blood, tissues, or cells to maintain normal physiological function. As a result, certain bodily functions begin to shut down; if hypoxia progresses, it will eventually lead to death.

FAR 91.211 outlines the requirements for supplemental oxygen. Every pilot, from a student up to ATP, has been required to memorize this regulation. *(If your memory has faded a bit, we've included the rule on Page 26. —Ed.)*

I've often thought this regulation was a cookie-cutter approach to supplemental oxygen. How could the FAA ensure that all pilots would still have proper oxygen levels in their blood after 29 minutes at 14,000 feet? The short answer is: they can't.

FAR 91.211 Supplemental Oxygen

(a) General. No person may operate a civil aircraft of U.S. registry—

(1) At cabin pressure altitudes above 12,500 feet (MSL) up to and including 14,000 feet (MSL) unless the required minimum flight crew is provided with and uses supplemental oxygen for that part of the flight at those altitudes that is of more than 30 minutes duration.

(2) At cabin pressure altitudes above 14,000 feet (MSL) unless the required minimum flight crew is provided with and uses supplemental oxygen during the entire flight time at those altitudes; and

(3) At cabin pressure altitudes above 15,000 feet (MSL) unless each occupant of the aircraft is provided with supplemental oxygen.



As a civilian-trained pilot, I was never able to experience altitude chamber training. I often wondered what my reaction/response would be to a low oxygen environment.

Age, body mass, medical history, smoking, and physical fitness are all major players in how our bodies absorb and use oxygen. Granted, the FAA cannot possibly address all the different scenarios, so flight safety falls directly in the pilot-in-command's lap.

As I've started flying longer distances at higher altitudes, all unpressurized, I've started to pay attention to my oxygen levels and the relationship between proper oxygen and pilot performance.

A bit of history

There are many NTSB reports where the accident or incident involved hypoxia. Probably the most famous hypoxia accident in recent history was professional golfer Payne Stewart's Lear 35, which departed Orlando, Florida, for a flight to Dallas, Texas. Pressurization problems and subsequent hypoxia caused complete crew incapacitation. The aircraft eventually exhausted its fuel supply and crashed in South Dakota, killing the two crew members and four passengers.

If you want to hear hypoxia's effects on pilots, I've added a YouTube link in Resources that follows the ATC transmissions of a Kalitta Air Cargo Lear 25 that experienced hypoxia issues.

Many readers of *Piper Flyer* do not operate high-performance, pressurized business jets, but the lessons learned apply to any pilot with an aircraft capable of flight over 8,000 feet.

I began training pilots in the Beechcraft King Air when I retired from the airline. Most of these pilots were transitioning from the military into civilian flying. I was always impressed, during the oxygen ground school sessions, to listen to each of their stories from the altitude chamber.

I quickly came to understand that the standard theory of "hypoxic euphoria" was, more often than not, only one of the many symptoms of oxygen starvation. As I trained more and more pilots, I began to ask them to list their main hypoxic symptoms. I started to catalog symptoms, and I was able to compile quite a list.

Among the symptoms were tingling in the fingers and toes, fatigue (even severe fatigue), muscle weakness, headache, dizziness, hot or cold flashes, numbness, color blindness, vision impairment, nausea, and, of course, euphoria.

Pilots may experience one or several of these symptoms: it's unique for each individual.

Training for hypoxia

I realized that knowing our personal symptoms as pilots was the key to preventing hypoxic encounters. As I became more intrigued with oxygen, oxygen systems, and hypoxia, I signed up for oxygen training at the FAA Training Center in Oklahoma City. Sadly, COVID-19 shut down all this type of training for many months.

My chance to take the course came when Portable Reduced Oxygen Training Enclosure (PROTE) training came to an airport close to my home base. The PROTE chamber allows the instructors to simulate the effects of "hypoxia," that is, reduced oxygen as encountered at 25,000 feet msl, so pilots can learn how to recognize the symptoms of hypoxia and respond appropriately.

The FAA Civil Aeromedical Institute travels around the country with the chamber, educating pilots to improve safety. Thanks to the hard work of our instructors, we were able to experience hypoxia symptoms in a very controlled and safe environment. Typically, the PROTE chamber and instructors set up at a venue for 3-4 days. All training is scheduled by web-based signup.

My day in the chamber

My home field is 115 nm from the airfield/flight school hosting the PROTE training. The morning weather was a pleasant 200-foot overcast with visibility between ½ and ¾ nm—a perfect day for a little IFR flying. The flight ended with an ILS as the weather around the area began to break up. I could hear other PROTE attendees starting to arrive around the same time I did.



The PROTE chamber allows the instructors to simulate the effects of "hypoxia," that is, reduced oxygen encountered at 25,000 feet, so pilots can learn how to recognize the symptoms of hypoxia and how to respond properly.

Johnston Regional Airport (KJNX) in Smithfield, North Carolina, and Triangle Aviation hosted the event. As a side note, the ultramodern FBO is connected to a big flight school and a great barbecue restaurant. The restaurant, "Low and Slow Smokehouse," made us feel welcome with a 20% discount on lunch.

The chamber is a sealed glass enclosure with oxygen scrubbers. Think oxygen out, nitrogen in. With this setup, there was no change in air pressure, so no blown-out eardrums, etc.

In the class in which I was participating, we had a representation of young to old pilots. Each had different reasons for attending the course, but overall, we were all interested in learning our personal symptoms. The classroom instruction was excellent. Mr. Brown covered an overview of hypoxia, its causes (and cures), what tasks we'd be expected to accomplish during the training, and a preview of the types of symptoms and behavior to expect.

We were each issued a clipboard with math and crossword problems, a line for our signature, and a list of symptoms for us to note at minutes one through five. Mr. Brown explained that after five minutes in this atmosphere, most pilots are basically useless; at seven minutes most will pass out, so our exposure time was going to be limited to five minutes. Our instructors stressed that your first symptom would usually be the most powerful.

Next, we were issued a fingertip pulse oxygen meter. In the classroom, we all measured somewhere between 96-98%. None of us are world-class athletes, so nobody recorded a 100% reading. Our trainers instructed us to note our symptoms at each minute in the chamber, and write down our pulse-ox number. Under no circumstances would the chamber safety officer allow our SpO2 (oxygen saturation, as measured by the pulse-ox device) to go below 65%.

We were assigned seat numbers and assembled at the chamber's first door. This area serves as a holding room before entering the oxygen-deprived section. Door opening times are kept to a minimum so the atmosphere can be maintained. We dutifully lined up, sealed the first door, then opened the door into the chamber. I hustled to my seat and got my oxygen mask ready to use. The PROTE folks use an airline-type, positive-pressure mask, so I was very comfortable with its operation.

At the one-minute point, I could feel the effects of hypoxia beginning. There was absolutely no feeling of euphoria for me. I

felt fatigued and slightly dizzy and had the feeling I was gulping air. At the three-minute mark, my overwhelming feeling was nausea. I told the instructor later I thought I needed a COVID-19 test.

At the four-minute mark, my pulse-ox meter showed 70%. The instructor said, "Mike, tell me the three control surfaces on your Piper." I answered promptly, "rudder, aileron, and there's another one, give me a minute, no I've got it, just let me think, I know this, I'm sure I can get it, give me just another minute…"

His command was, "Mike, put your mask on." I picked up the oxygen mask (which felt like it weighed 25 pounds in my oxygen-deprived state) and started breathing pure oxygen. I was watching the color chart and was amazed at how the colors all became perfectly clear. My hypoxia symptoms disappeared in seconds. I noticed the youngest member of our group had been the first to don oxygen, as he was headed for a little reduced-oxygen nap.

Once on oxygen, I was sure to keep the mask on until I got out of that chamber. Our instructors warned us that students (like us) would occasionally take in several deep breaths of oxygen and then remove the mask to see the effects. He said this usually caused a hypoxic headache. He assured us that we did not want that.

We returned to the classroom, and all five of us reviewed our symptoms. No one in my class had the euphoria we always hear about with hypoxia, but the symptoms we experienced were as varied as the students themselves. We had reports of hot/cold flashes, fatigue, headache, dizziness, blurred vision, loss of color vision, blue-trending-toward-black vision, numbness, and nausea.

Reviewing my results, Mr. Brown said that nausea was probably one of the "better" hypoxic symptoms one could have. He said, "when you feel bad, you wonder why you're feeling bad." In a euphoric condition, the world is simply a happy place, and a pilot may fail to take action to fix the issue, thinking everything is right with the world.



Mr. Brown explained after five minutes in this atmosphere, most pilots are basically useless, at seven minutes most will pass out, so our exposure time was going to be limited to five minutes.

Identifying hypoxia

How do we, as pilots, fix the issue of hypoxia? Well, there's no "fix," but we have tools, and we have options. On the tool front, buy a pulse-oxygen meter (pulse oximeter). The cheapest are the ones that attach to your fingertip. They are very low cost and are easy to store in the airplane.

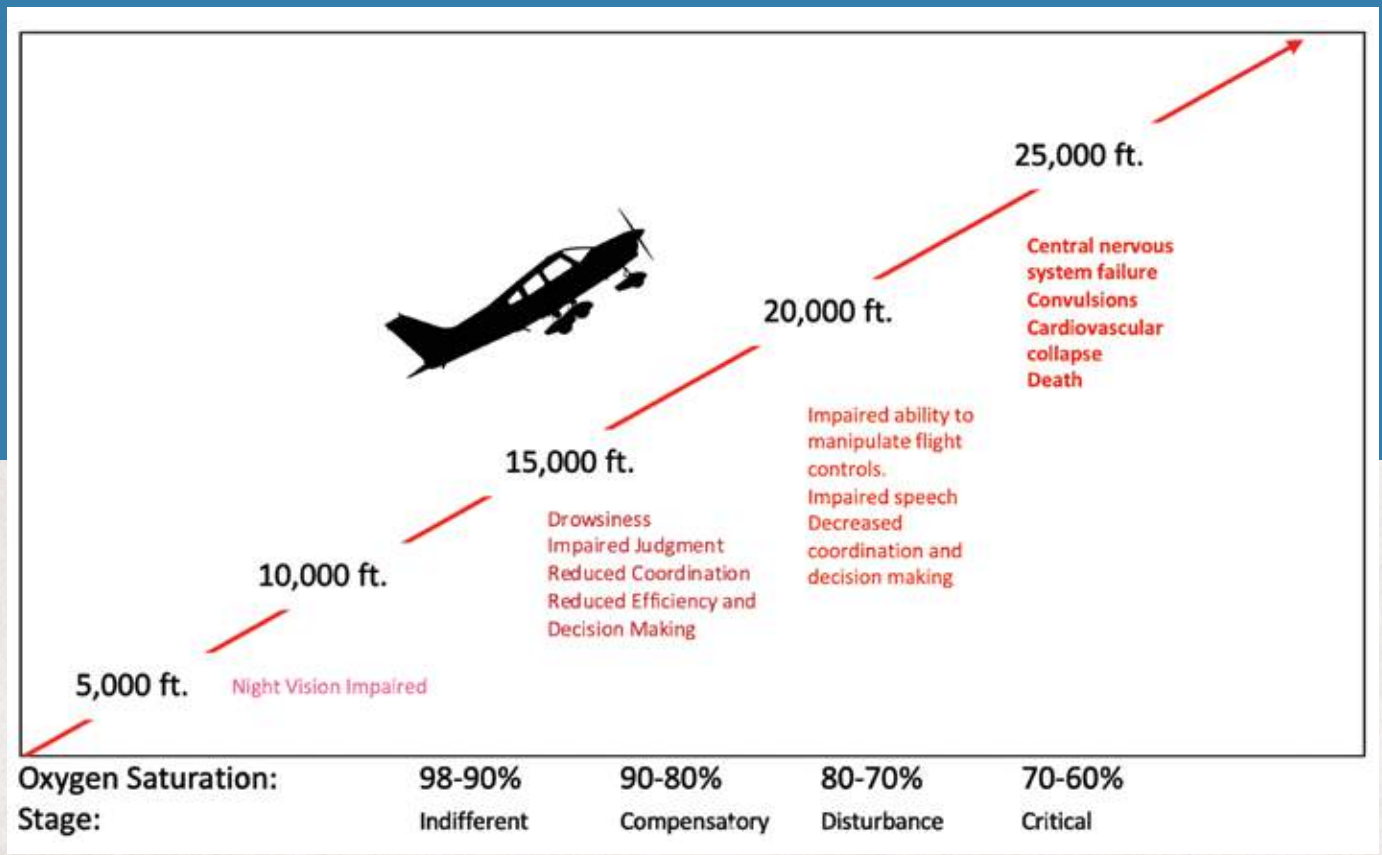
For those of you with the later version of the Apple Watch, it has what I've found to be a reasonably accurate blood oxygen recording unit. However, I also found that it's very difficult to use in the airplane since your arm must be kept perfectly still during the measurement.

Our class had an attendee who had recently retired as the head of the cardiology department at the University of North Carolina. He was fascinating to visit with and talked me into purchasing a pulse-ox ring. Wearing the ring gives me a continuous readout of my oxygen level and can set an alarm at, say, 90%. If my ring alarms, I know it's time to don oxygen or descend expeditiously to a lower altitude. While more expensive than the fingertip measuring unit, it appears to be a much better diagnostic unit. Amazon is delivering mine tomorrow.

Oxygen equipment

There are several choices for aviation oxygen equipment. For me, purchasing oxygen equipment was the easy part. Getting the bottle filled proved to be much more challenging. Several months ago, I bought an oxygen bottle and system, and have been getting used to the bottle and breathing cannula.

I've been trained for many years that the aviators' breathing oxygen ("ABO") is the only oxygen a pilot should use. Oxygen comes in three forms, aviation, medical,



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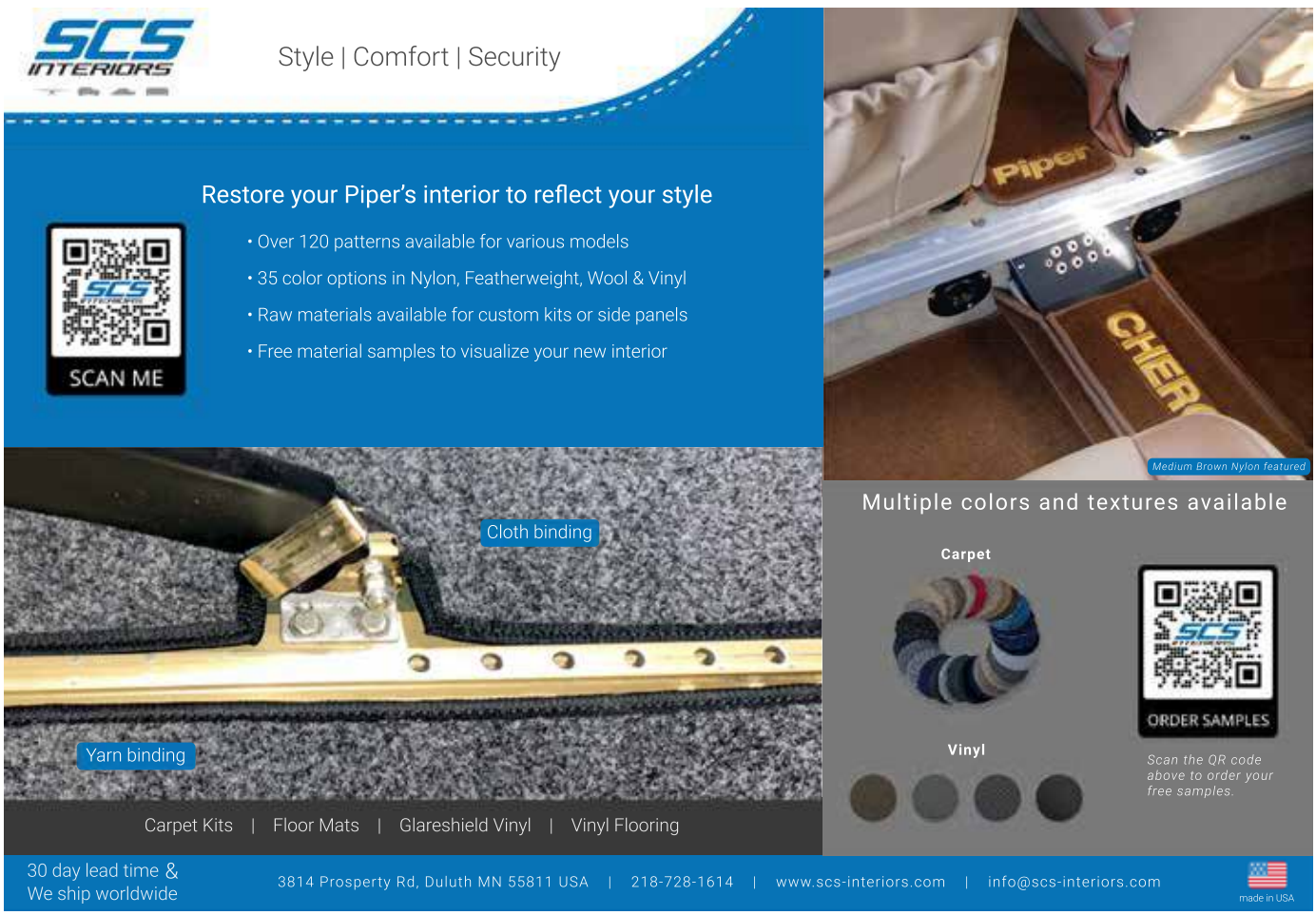
and industrial. For decades, I was taught that aviators' oxygen was free from moisture and thus safe for high-altitude use.

After much research and many hours of carrying my oxygen bottle from FBO to the commercial gas distributors, I found it nearly impossible to get my bottle filled. In the FBO, you're paying not only for the oxygen but also for the A&P's expertise in filling the bottle. My small bottle was $65.00 to replenish! The guys at the oxygen-filling companies were not willing to fill my bottle without a prescription from my doctor stating I needed oxygen.

After many hours of discussion, I returned to the company from where I purchased the oxygen equipment, and they informed me that today's commercial oxygen is all the same. Aviation, medical, and industrial oxygen come from the same manufacturing source. All are clean, and all are dry.

Of note, I asked a King Air student who happened to be a neurosurgeon about the water content in medical oxygen. He chuckled and asked if I'd ever watched any medical dramas on television. He said, "Did you see the oxygen bubbles at the top of the oxygen rack? That's where medical oxygen gets its moisture: in the hospital, not at the oxygen store."

Peter Garrison, who has been a *Flying* magazine contributor since I was in grade school, stated in his "Aftermath" column, "Incidentally, it is not clear that there is any longer a difference between aviators' breathing oxygen, medical oxygen, and welding oxygen. Aviators' oxygen supposedly contains less moisture, which could become an issue in systems plumbed through unheated parts of an airplane, where moisture might freeze, blocking flow. That may have been the case decades ago. But modern oxygen distillation systems yield pure, dry oxygen for all purposes; in fact, in hospitals, the oxygen is remoisturized (by passing it through a sort of bong) on the way to the cannula to avoid dehydrating the patient's mucous membranes."



If it's good enough for Garrison, it's good enough for me.

I now fill my bottle for about $4.00. The equipment to do so is readily available from your oxygen supply company. The upside is that I am not reluctant to conserve oxygen, and find myself putting my oxygen mask on when cruising at 9,000 feet or at the end of a night flight.

Lastly, if you say that you never fly at altitudes that require oxygen and thus are reluctant to spend the money for an oxygen system, I fully understand that. But there is an affordable alternative. A product called Boost Oxygen is available at many big-box home improvement stores, neighborhood pharmacies, and sporting goods stores, as well as online at Amazon. It works well for a boost of oxygen at the end of the flight and is great to have on hand for that passenger that may be just a little nauseous during a bumpy ride.

After 24,000 hours of flight, I continue to learn something aviation-related each day. To bring our readers up to date: after retirement from a major airline, I began a position teaching in King Air aircraft. I have since resigned from that job and am now teaching at an express airline in the simulator. I am working with the best and brightest of our new pilots entering the industry and have been astounded at their professionalism and maturity. I'm not sure I displayed the same level of maturity when I was 24. From what I've seen, our industry is in good hands.

For all pilots, stay engaged, continue to study, and never be satisfied. If you get a chance, please take advantage of the FAA PROTE program and discover your hypoxia symptoms. You never know; it may save you one day.

Mike Davis *soloed on his 16th birthday. Since then, his flying has included over 2,000 hours of primary flight instruction, one corporate job, and four airline mergers. He is a CFI/CFII/MEI and is currently instructing new airline pilots. Send questions or comments to editor@piperflyer.com.*

RESOURCES

PFA SUPPORTERS

AEROX
aerox.com

MH OXYGEN SYSTEMS
mhoxygen.com

OTHER

FAA AIRMAN EDUCATION PROGRAMS: AEROSPACE PHYSIOLOGY (IN OKLAHOMA CITY)
www.faa.gov/pilots/training/airman_education/aerospace_physiology

FAA HYPOXIA AWARENESS TRAINING DATE ANNOUNCEMENTS (USE SEARCH KEYWORD "HYPOXIA" OR "PROTE")
www.faasafety.gov/SPANS/events/EventList.aspx

KALITTA FLIGHT 66 HYPOXIA INCIDENT
youtube.com/watch?v=zwp19C5wdrsBiography



SERVICE

Piper Service Bulletin SB 1375B for PA-28 and PA-32 Landing Gear

Piper SB 1375B is a critical correction for errors in SB 1375A, which may affect airworthiness if you've already complied with the earlier version.

By Steve Ells

Piper issued Service Bulletin SB 1375 March 31, 2022. This bulletin is titled "Periodic Replacement of Main Landing Gear Attachment Hardware."

The bulletin applies to Piper PA-28 models from the PA-28-140 Cherokee Cruiser through the PA-28-201T Turbo Dakota, and PA-32 models from the PA-32-260 Cherokee Six through the PA-32-301XTC Piper 6XT.

In other words, the service bulletin covers all PA-28 and PA-32 models.

The bulletin calls for the replacement of main landing gear attachment hardware after 2,000 hours of time-in-service (TIS) or seven years, whichever occurs first. After the initial inspection, the bulletin calls for reinspection every 2,000 hours TIS or seven-year period, whichever occurs first.

To accompany Figure 1 (Main Landing Gear), replicated here, the bulletin states: "The main landing gear (MLG) are attached to the aircraft with threaded fasteners that pass through mounting flanges on the strut cylinder and the upper and lower flanges of the main wing spar, as depicted in the illustration below. On some of the affected aircraft, additional threaded fasteners pass through the web of the main wing spar."

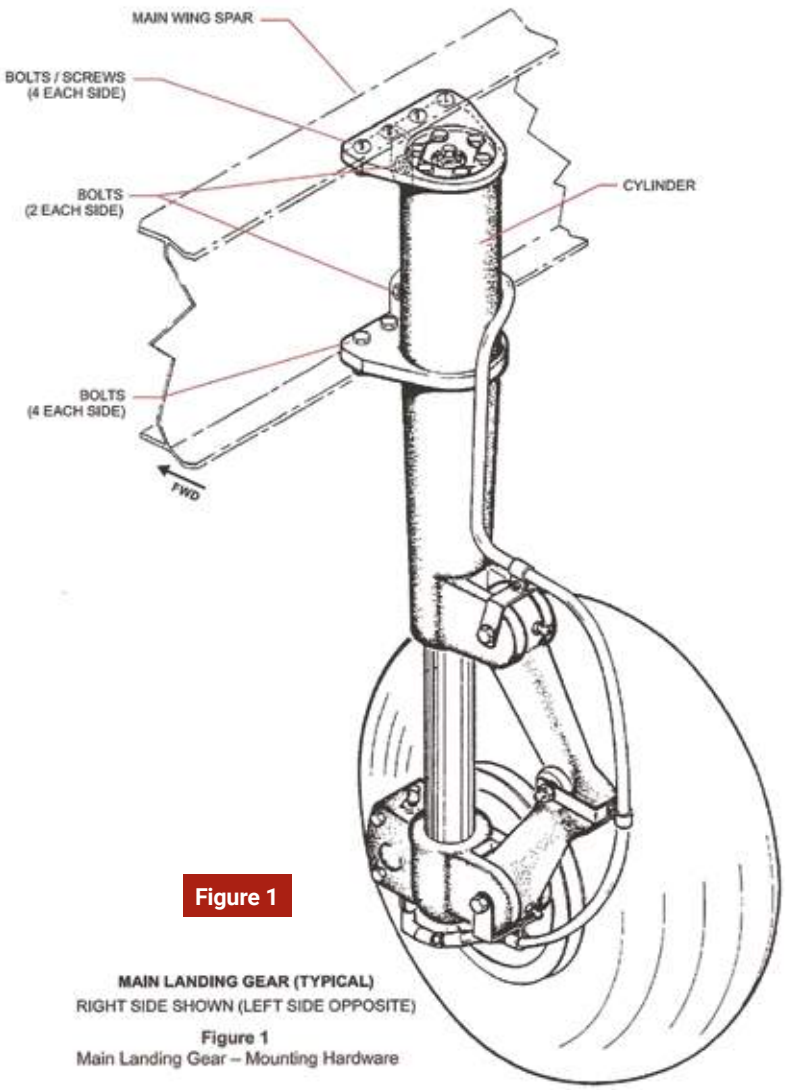


Figure 1

Figure 1
Main Landing Gear – Mounting Hardware





The inspection proceeds after the airplane is put on jacks to take the weight off the left and right main landing gear.

SB 1375 calls for the removal of all hardware (bolts, washers, and nuts) that secures each landing gear leg to the wing spar, followed by an inspection of the mounting holes.

According to the parts manuals, the attach hardware is all standard aviation hardware—AN4-11A and AN4-6A bolts, AN 525 screws, and AN 365 self-locking nuts.

Any wear seen in the bolts/holes calls for a phone call to Piper Tech Support for repair schemes.

After inspection and any necessary repairs, install new mounting hardware per the specifications in the appropriate parts manual.

SB 1375A

Nine months after SB 1375 was issued, Piper released SB 1375A. It contained the following note: "Service Bulletin (SB) 1375A supersedes SB 1375 in its entirety. Aircraft that were previously made compliant with SB 1375 are in compliance with SB 1375A."

SB 1375A applied to the same PA-28 and PA-32 models as SB 1375, and had the same inspection intervals.

SB 1375A provided extensive detail about allowable wear tolerances in the bolt holes in the upper and lower spar caps and in the spar web.

This specific data makes it relatively easy for technicians in the field to determine wear limits for the holes in the spar web and lower spar cap, especially when compared to the directions in SB 1375, which called for contacting Piper Engineering for guidance when hole wear was suspected,

SB 1375A provides calculations for technicians to select the proper oversized replacement hardware. In addition, the bulletin provides part numbers for replacement and oversize hardware.

Unfortunately, a mistake in the hardware call-out in the bulletin created airworthiness problems for owners that had complied with SB 1375A.

SB 1375B

SB 1375B was issued Feb. 21, 2023. It contains the following warning under the bulletin header:

"Service Bulletin (SB) 1375B supersedes SB 1375A for bolt-hole inspections. However, if any of the four factory original screws in the upper flange were replaced with oversize fasteners as part of compliance with SB1375A, contact Piper for disposition.

"WARNING: SB 1375A SPECIFIED INCORRECT REPLACEMENT SCREWS FOR THE UPPER FLANGE. ACCORDINGLY, IF ANY OF THE FOUR FACTORY ORIGINAL SCREWS IN THE UPPER FLANGE WERE REPLACED WITH OVERSIZE FASTENERS AS PART OF COMPLIANCE WITH SB1375A, THE AIRCRAFT MAY NO LONGER BE AIRWORTHY, CONTACT PIPER FOR DISPOSITION."

Material removal in upper spar cap

SB1375A called for installing NAS7404 countersunk fasteners in place of the AN 525 structural screws to secure the landing gear leg to the upper spar cap.

NAS7404 fasteners have a 100-degree countersunk head. In order to install them per the bulletin, material would have to be cut away from the top surface of the upper spar cap in order for the head to be flush with the upper surface of the wing.

My conclusion is that the material removal is the reason bulletin 1375B stated that "if any of the four factory original screws in the upper flange were replaced with oversize fasteners as part of compliance with SB 1375A, the aircraft may no longer be airworthy."

Oversize holes

SB1375B also contains instructions on the type and part numbers of special fasteners to install if any bolt holes are worn to the point they're oversized. NAS6204 fastener part numbers are available for installation in holes that are 1/64 inch oversize and 1/32 inch oversize. MS14226 washers must be installed with each oversized fasteners.

I imagine that Piper is hoping no one installed the NAS7404 fasteners. I too hope that none of our *Piper Flyer* readers complied with that bulletin.

IMPORTANT: This article describes work that may need to be performed/supervised by a certificated aviation maintenance technician. Know your FAR/AIM and check with your mechanic before starting any work.

Steve Ells *has been an A&P/IA for 45-plus years and is a commercial pilot with instrument and multi-engine ratings. Ells also loves utility and bush-style airplanes and operations. He served as associate editor for* AOPA Pilot *until 2008. Ells is the owner of Ells Aviation and the proud owner of a 1960 Piper Comanche. He lives in Templeton, California. Send questions and comments to editor@piperflyer.com.*

RESOURCES

PIPER SERVICE BULLETIN NO. 1375B
s3.amazonaws.com/pipercrm/Solution/20873/SB_1375B.pdf


SPARTANBURG
Seneca II

Life with a Seneca II:

2023 Update

With over 3,000 hours of flight time in four different Seneca IIs, contributing editor **MICHAEL LEIGHTON** speaks about what life with a Seneca II is really like.



Seneca II



I originally wrote about the Piper PA-34-200T Seneca II back in 2016 while operating my third Seneca II, N9333K. That aircraft was a wonderful plane. With three-blade props and full de-ice, we flew her everywhere. But a Seneca II is not a good training platform and I had a ton of multi-engine training to do, so I reluctantly sold her.

Last year, I purchased another Seneca, of the same vintage though not as highly modified, with two-blade props. N34BF came radar-equipped, something I am very comfortable with, and the weight penalty was offset by the two-blade versus the three-blade props.

Bravo Fox is my fourth Seneca II. All four have been the same vintage—and all within 200 serial numbers of each other—but each was unique.

While the Seneca is not as fast as a Beechcraft Baron 58 and doesn't have the same useful load as a Cessna 310—the other six-seat twin-engine airframes in its class—a Piper Seneca does have some very desirable and endearing qualities that make it a tremendous value.

First of all, it is incredibly forgiving to fly. The counter-rotating engines on the Seneca II eliminate the critical engine issue found on conventional twins and eliminate the need for right rudder on climb.

The large double cargo door and quickly removable rear seats make loading large and bulky cargo easy. I have hauled a full-sized refrigerator in a Seneca.

The club configuration for the passenger seating is great, though you can find early Seneca IIs with all forward-facing seats. The cabin on the Seneca is larger than the Baron 58, and club seating is not available on the Cessna 310.

The engines on the Seneca II are Continental TSIO-360-EBs that make 215 hp for takeoff. The turbochargers give you the option to go high if you want, allowing you to get over weather or terrain and take advantage of a ripping tailwind.

I routinely run my Seneca in the 10,000- to 12,000-foot range just so I don't need to wear oxygen, but I have no reservations about putting on the mask and taking her





to 15, 16, or 17,000 feet where I can see 200 knots true and take advantage of the winds or stay out of the weather.

Last week, I flew my family to Dallas for a youth sporting event. On the way home, we climbed to 12,000 feet so we could enjoy a 90-knot tailwind. We made 256 knots over the ground.

Seneca STCs

There are literally dozens of aftermarket STC'd products for the Seneca, and on one plane or another, I've purchased most of them. Axial flow cowls (like a Seneca V) from Laminar Flow Systems; flap and aileron gap seals and wing root fairings from Knots 2U; vortex generators (VGs) from BLR Aerospace; inflatable door seals; one-piece windshields; larger-capacity heaters; and wingtips with forward-facing recognition lights from LoPresti are just a few.

Bravo Fox doesn't have many of these. I did install a Garmin G5 AI and G5 HSI to replace the vacuum-powered gyros. The G5 HSI interfaces with the ancient but reliable Century IIIC autopilot that came with the plane from the factory. I retained the vacuum pumps to run the autopilot gyro and the de-ice boots.

A Seneca II is likely the most insurable six-seat twin on the market, according to my insurance agent, Dennis Einstein. Due to its counter-rotating props, simple systems, and docile flight characteristics, underwriters recognize the PA-34 as an entry-level twin.

Even though Senecas are often flown by lower-time multi-engine rated pilots, the aircraft design has a very good accident/incident loss record. The insurance on *Bravo Fox* was half of the Beechcraft B55 it replaced—with the same hull value and threshold of liability.

FIKI certified

Bravo Fox is certified for flight into known ice. Now don't get the idea that you can go charging off into an ice storm in a Seneca that is FIKI equipped because, like most piston airplanes, a Seneca doesn't carry ice well. The FIKI approval just allows you to legally file a flight plan and affords you a few extra minutes to get out of the ice should you encounter it.

I had to use the de-icing capabilities more than once last winter and it is a simple system, with boots on the wings

Bravo Fox is my fourth Seneca II. All four have been the same vintage— and all within 200 serial numbers of each other—but each was unique.











and tail, an electric hot plate on the windshield, and heated pitot and static ports. The props use electrically-heated pads for anti-ice protection.

Just having a FIKI-certified aircraft has made more than a few trips possible, even though it wasn't needed. There is a speed penalty for having those boots on the plane, however. It will cost you 5 knots, but to me, that's well worth it if flying in ice is a possibility. On that trip to Dallas, we ran the de-ice continuously as temperatures were below freezing and we were in solid IMC most of the time.

Fuel system and operation

At 10,000 feet, I typically flight plan for 166 knots at 30 inches of manifold pressure and 2,300 rpm, or approximately 70% power. That happens on a conservative 24 gph and approximately 1,475 F on the EGT/TIT.

Some Senecas came with 93-gallon tanks, but three of the Senecas I owned have featured the optional 123-gallon system. This yields four hours at cruise and about 650 nm range with an hour reserve.

Bravo Fox came with a rare Nyack (now Griggs) nacelle tank system. It's a great system that utilizes two 13.5 gallon tanks (one in each nacelle) and a simple on/off transfer pump that moves the fuel into the main tank. When I bought the plane, the STC paperwork was missing and the people at Griggs were happy to supply me with a new copy along with the supplemental data sheet.

For utility, you really want that 26 gallons, but the ability to partially fuel for weight and balance purposes is very much appreciated.

The fuel gauges in all of my Senecas were terribly inaccurate and *Bravo Fox* is no exception. The float system is difficult to work on and changing the floats is a difficult task. Even with new fuel gauges and senders, I just don't trust the gauges. On all Senecas, the fuel filters are in the wings and are difficult to access. They also require 100-hour inspections.

Other than that, the fuel system is simple as a rock to operate, featuring only on, off, and cross-feed as selector options. In normal operation, the left tank feeds the left engine and the right

tank feeds the right engine. Cross-feed allows you to access the fuel on either side and send it to either engine in the event of a fuel delivery problem or engine failure.

Engine management

On the subject of safety, let me assure you that the Seneca will fly on one engine at gross weight on a standard day, though there is no regulatory requirement for it to do so. It will fly and climb on one engine at anything below gross weight, even on a hot day, at sea level. I can tell you this from personal experience.

Now, you will need to do everything right; get the failed engine secured, have the ball halfway out to the good side, and the dead engine up 3 degrees. Climb performance will not be spectacular, but it will give you a couple of hundred fpm. Like all piston twins, the key to single-engine safety in a Seneca is to not fly it at gross weight on a hot day.

Part of the simplicity of the Seneca II is the fact that it features a fixed wastegate on the turbos and has no absolute pressure controller (APC). Your right hand replaces the APC. That means that every time you change anything—mixture, throttle, or prop—you change everything, and therefore need to constantly be tweaking the engine settings.

Even a change in barometric pressure will change the power setting. While it sounds like a pain to deal with, it becomes second nature quickly.

An engine analyzer is a must for getting anything close to maximum performance from the engines. I run mine at 1,475 F peak EGT and that yields a turbo inlet temp (TIT) of around 1,450 F. That is cooler than the book recommends, but my engines have made it all the way to TBO every time.

In fact, over the course of my four Senecas, plus two more I have operated under Part 135 (air charter), I have had to change exactly one cylinder. I never run LOP (lean of peak). That, of course, is an electric topic for discussion, but my mentor, a Charles Taylor award winner, would regularly say "fuel is cheap, cylinders are not."

The landing gear is an electro-hydraulic affair, similar to what you find on a Piper PA-28R Arrow. It uses hydraulic pressure to keep the gear up and a dump valve as a manual extension system with over-center cams for down locks.

The large double cargo door and quickly removable rear seats make loading large and bulky cargo easy. I have hauled a full-sized refrigerator in a Seneca.

Other than a rather low maximum retraction speed (due to the nosewheel retracting forward, into the wind), it is a simple and reliable system. The main tires and the nosewheel are the same size, 6.00-6, so it's practical to keep one on the shelf for a spare.

Piper chose to mount the landing and taxi light on the nose strut, thus making them unavailable for use in flight with the gear up. The design is common for aircraft of that vintage; my Beechcraft King Airs were the same way. The fix is to install aftermarket forward-facing wingtip recognition lights like the ones you find on a late-model Seneca. The new LEDs pull next to no power and are 10 times as bright.

Maintenance

The Seneca II doesn't have a lot of recurring Airworthiness Directives to deal with.

The landing gear is the most problematic; the nosegear in particular requires attention every 50 hours. Piper Service Bulletin 1123C published in May 2013 addresses that. Most of what's involved is a required lubrication schedule to prevent the nosegear from failing.

The main gear has a few ADs directed at the clevis pins and trunnions, but most airplanes you will find on the market have had those ADs permanently complied with.

Other noteworthy ADs include 2013-02-13, which talks about inspecting the stabilator cables and turnbuckles, and 2010-15-10, which is a control yoke inspection. Neither of these ADs is complicated or particularly expensive.

The heater is a combustion affair that requires an inspection and some maintenance, depending on which one is installed in the plane.

Parts availability

Parts are readily available for the Seneca. Engine parts for the left-hand turning Continental LTSIO-360 were difficult to get for a while, but that situation has gotten better.

The just-issued Continental crankshaft AD does affect the TSIO-360 series but only for specific crankshafts.

I have had a very good experience with all eight of the engines on four Senecas. *Bravo Fox*'s engines just hit TBO and are running strong, consuming less than 1 quart of oil every seven or eight hours. They are reliable and easy to manage. I have had to replace one cylinder in approximately 3,000 hours of flying, spread over the four airplanes I have owned.

I have a flight student that owns a Seneca II of the same vintage and just overhauled his left engine. It ran fine, and hadn't reached TBO—but it had been 20 years since the last overhaul. He was concerned that if he had a problem with the left engine that resulted in an accident or incident, the insurance company might have a problem with that.

He changes the oil every 25 hours and does an oil analysis. I do the same. We both feel that oil is cheap, while an overhaul is now around $45,000. Once you throw in accessories, it's closer to $55,000.

If the engine has an Achilles' heel, it is the fuel injection system; specifically, the fuel pumps, which are a complicated affair to set up properly and contain some delicate little diaphragms that can and do fail.

On the later model Seneca Vs, Piper fixed this issue by switching to a Bendix system similar to what you find on Lycoming engines.

I have been getting 1,000 to 1,500 hours out of the turbos between overhauls. Unlike some other designs, there are no cooling issues with the turbos



on a Seneca. The one-way check valves which send oil to and from the turbos are notorious for leaking and rather than deal with that, I have them overhauled when I do the turbos.

Other features

The aircraft originally came from the factory with two-blade props. My first two Senecas had them, and so does *Bravo Fox*. They were slightly faster than the one I owned with the three-blade props.

Three-blade props are heavier, eating into the useful load by about 70 pounds, but do offer significantly better climb and smoother, quieter operation.

The brakes are right out of the PA-28 Cherokee series, complete with a hand brake for a parking brake. The brakes are a pain to bleed, and the parking brake hydraulic valve tends to leak—but once you get it right, it, too, is very reliable.

On the Seneca, the brakes came in two versions, regular and heavy duty. There is even a separate set of performance tables in the POH for landing distances depending on which kind you have.

Flying the Seneca

In my experience, there isn't another twin out there in its class that is as easy to fly as a Seneca. It's super stable in all axes and makes a great instrument platform.

A Seneca can get a little pitchy when loaded to the aft end of the CG envelope, and the flaps make nose-high full-flap landings with two people up front and the passenger seats empty a challenge. The landing technique that gets the best results is to carry a little power right into the flare.

If you equip your Seneca with VGs, however, this issue goes away. As I understand it, in stock configuration, the stabilator experiences aerodynamic blanking when the aircraft is in the landing configuration in the flare. VGs fix that problem, and the airplane has plenty of elevator authority throughout the landing phase of flight.

I have routinely operated my Senecas off grass/unimproved runways and in and out of crushed coral strips as short as 2,000 feet. The plane is made to do it, with its large 6.00-6 main and nose tires. Partial-flap takeoffs yield a flat climb attitude that can best be described as elevator-like.

Engine temperature management—usually the bane of turbocharged piston singles and twins—is pretty easy on the Seneca. The cowls are plenty large, and there are no issues cooling everything in there. All that is required to prevent shock cooling is to reduce power 3 inches every 60 seconds or so, a technique I teach my students.

For takeoff, hold the brakes and bring the power to 38 inches of manifold pressure. Full takeoff power is 40 inches of manifold pressure—it will ram up the last 2 inches on the takeoff roll. The only overboost protection the aircraft offers is a light warning the pilot of the situation, and an automotive-style pop-off valve which is supposed to open at 41 inches of manifold pressure.

I don't count on either and pay particular attention to setting takeoff power. At 400 feet, (top of first-stage climb) you bring the props back to 2,400-2,450 rpm from the 2,575 rpm red line first. The slower RPM yields a slower turbo speed and thus a lower manifold pressure, which you then set for between 33-35 inches for the climb. The plane "thinks" it at sea level, so the mixture remains full rich until cruise.

Cost of ownership

The Seneca II is a tremendous value in today's used aircraft market and a viable choice for anyone thinking about moving up to a light twin. I purchased *Bravo Fox* in March 2021 for $94,000. It had 1,650 hours on the engines and 3,400 hours on the airframe at that time.

The average single-engine pilot will have little or no trouble transitioning into a twin flying a Seneca II.

In 2021, we put 149 hours on *Bravo Fox*. My all-up, guts, feathers, hangar, and insurance cost, including fuel and insurance, was $459 per hour. My average fuel cost last year was $6.60 per gallon. I could go on to expound upon the virtues of two engines, especially at night or over water or inhospitable terrain, but that is the subject of another article.

Like any aircraft purchase, do your due diligence before you buy. Spend the money on a quality pre-buy and find a competent instructor to walk you through your training. Once you do that, you will find that life with the Seneca II is good.

Michael Leighton *is a 14,000-hour, three-time Master Flight Instructor and operates a flight school, a charter company and maintenance facility in South Carolina and South Florida. You can find him on the web at flymkleighton.net. Send questions or comments to editor@piperflyer.com.*

RESOURCES

PFA SUPPORTERS

BLR AEROSPACE
blraerospace.com

KNOTS 2U LTD.
knots2u.com

OTHER

LAMINAR FLOW SYSTEMS
laminarflowsystems.com

LOPRESTI AVIATION
loprestiaviation.com

FURTHER READING

PIPER SERVICE BULLETIN 1123C
AD 2010-15-10
AD 2013-02-13
PiperFlyer.com/forums under "Magazine Extras"

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In 1965, while developing the PA-32 Cherokee Six, the ever-inventive engineers at Piper had the idea to see how the airframe would fare as a tri-motor. First, they added two 115 hp Lycoming O-235 engines to the wings to complement the 250 hp Lycoming on the nose. Next, they replaced all three engines with 150 hp Lycomings. To the surprise of no one reading this article, neither configuration proved satisfactory.

According to Piper historian Roger Peperell, "The tri-motor configuration was abandoned because the drag of the un-featherable propellers and fixed gear made the performance unacceptable and the extra cost and complication of three controllable pitch propellers was excessive."

Abandoning the tri-motor, Piper then turned its attention to creating a Cherokee twin. After many starts and stops and many changes and much redesign over the course of approximately five years, Piper had its Cherokee twin, now named "Seneca."

SENECA MODELS

PA-34-200 Seneca

The first of the Senecas, the PA-34-200, received FAA approval May 7, 1971. It was certified with seven seats and 200 hp counter-rotating fuel-injected engines; a Lycoming LIO-360-C1E6 (right side) and a Lycoming IO-360-C1E6 (left side), for Serial Nos. 34-E4, 34-7250001 through 34-7250214.

Serial Nos. 34-7250215 through 34-7450220 were equipped with fuel-injected Lycomings; a Lycoming LIO-360-C1E6 (right side) and a Lycoming IO-360-C1E6 (left side). Engine limits for all operations were capped at 2,700 rpm and it had a maximum ramp weight of 4,000 pounds for the earlier serial numbers and 4,200 pounds for the latter. It had a useful load of 1,414 to 1,614 pounds.

PA-34-200T Seneca II Turbo

Some operators found the original Seneca's performance to be underwhelming, and Piper began development of a turbocharged version in 1970. The result of that was the PA-34-200T Seneca II Turbo.

It was fitted with a 200 hp Teledyne Continental TSIO-360-E or TSIO-360-EB (left engine), and a 200 hp Teledyne Continental LTSIO-360-E or LTSIO-360-EB (right engine) running at 2,575 rpm. The maximum ramp weight was increased to 4,570 pounds and the useful load increased from 1,722 to 1,800 pounds.


Jim Koepnick / koepnickphotography.com



PA-34-220T Seneca III Turbo

The PA-34-220T Seneca III Turbo was certified Dec. 17, 1980. Changes from the "II" model included a one-piece windshield, three-blade propellers, and modified main gear oleos. It also received another ramp weight increase to 4,773 pounds (4,750 pounds at takeoff), with a useful load increase to 1,898 to 1,921 pounds.

The III came equipped with upgraded 220 hp fuel-injected engines—a Teledyne Continental TSIO-360-KB on the left, and a Teledyne Continental LTSIO-360-KB on the right.

PA-34-220T Seneca IV Turbo

In 1993, the PA-34-220T Seneca IV Turbo replaced the III when it was certified Nov. 17, 1993. The primary difference between the III and IV is the axisymmetric cowl. It had other cosmetic changes. The max ramp weight and useful decreased to 4,750 pounds and 1,436 pounds, respectively.

PA-34-220T Seneca V Turbo

The final (so far) variation of the Seneca—the PA-34-220T Seneca V Turbo received its certification Dec. 11, 1996.

It was equipped with a Teledyne Continental TSIO-360-RB for the left engine, and a Teledyne Continental LTSIO-360-RB for the right engine. Max ramp weight for the V is 4,773 pounds (4,750 pounds MTOW), with a useful load of 1,331 to 1,373 pounds.

As of 2019, Piper had produced about 5,000 Senecas, and the model remains a popular choice for both business and recreational flyers.





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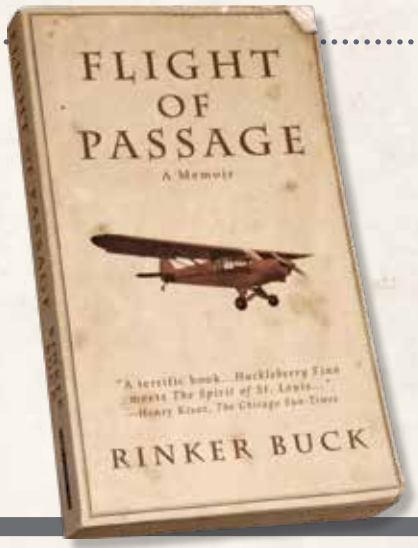


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FLIGHT OF PASSAGE 2022 PART TWO– FLYING TEXAS

Retracing the inspirational 1966 flight of the Buck boys – Days Three through Five.

Words and Images by Dennis K. Johnson



The Sixth Floor Museum preserves the site from which JFK was assassinated. Photo courtesy of Sixth Floor Museum at Dealey Plaza.

This story is a continuation of "Destination: Flight of Passage, 2022" that appeared in the January 2023 issue of *Piper Flyer*, a retracing of the route described in Rinker Buck's "Flight of Passage." This month, we pick up the route of the Buck boys, Kern and Rinker Buck, in Arkansas.

Day Three, Monday, July 4, 1966

The boys rose at dawn and "never looked back and never wanted to hear of Brinkley, Arkansas, again."

"A lonely stretch of flying lay before us," wrote Rinker. According to the image of their expense log printed in Rinker's book, they must have stopped at Hazen (24 miles southwest) after 35 minutes of flying to find another "dead airport," and, he notes, "free oil." Did they help themselves to a can of oil? Today, 57 years later, Rinker admits that they did.

They continued over timber barrens and swamps for 60 to 70 miles, following the railroad to Arkadelphia, Arkansas, until the landscape gave way to "rolling beige and red grasslands." The boys stopped at Dexter B. Florence Memorial Field (KADF) in Arkadelphia. Their expense log reads "HAZ-ARK" and shows they bought 9.3 gallons of fuel and ate breakfast.

From Arkadelphia, they followed "the pretty, undulating farm country along the Little River...with the lakes up by Hot Springs glittering like new silver, and the Ouachita Mountains to the northwest."

Again, Rinker doesn't mention it in the book, but their expense log reads, "ARK-NASH (dead airport)" and "free gas–no one there." Rinker told me they helped themselves to a few gallons of fuel at Howard Co. Airport (M77), north of Nashville, Arkansas, where they found the airport deserted. FBOs were giving them free fuel and oil all along the way, so they didn't consider it stealing.

At noon they "reached the Red River and dashed across the hard, beige plains along the southeast corner of Oklahoma," their "first view of the real west." They landed at Durant Regional Airport–Eaker Field (KDUA) in Durant, Oklahoma, for fuel and lunch.

"Texas, mythic Texas, the Shangri-la of barnstorming blarney, was just an hour away."

Rinker told me they helped themselves to a few gallons of fuel at Howard Co. Airport (M77), north of Nashville, Arkansas, where they found the airport deserted. FBOs were giving them free fuel and oil all along the way, so they didn't consider it stealing.



You can sit at the presidential desk in this replica Oval Office at the George W. Bush Presidential Center. Photo courtesy George W. Bush Presidential Center.

They entered Texas over Lake Texoma just north of Denison, Texas. "Denton went by, then Decatur, Paradise, and Perrin." Rinker wrote, "the turbulence was brutal," and that they should have "known the cardinal rule of western flying; never take off in the heat of midday."

Their expense log indicates they stopped at Decatur, Texas, for a can of oil. Likely, this was Decatur Municipal Airport (KLUD).

Along this leg, "Kern authoritatively called back that we were now in the heart of Stearman alley," and the boys discovered prairie dog colonies. They made low passes which sent the critters scurrying for their holes, but the boys dropped them a sugary Moon Pie as a reward.

They passed Breckenridge to land at Taylor Airport, just north of Albany, Texas. Today, it looks like a large grass field that someone with an airplane may be using, but no aircraft or hangars appear on Google Maps images, and the airport doesn't appear on the sectional chart. Pilots retracing the route will want to use Albany Municipal Airport (T23).

The town "looked quaint and ideally western." The boys checked into a hotel, "a grand old-fashioned affair with a white adobe front and Mexican tile floors." On the Fourth of July in the heart of Texas, the brothers enjoyed chicken-fried steak for dinner and bought themselves cowboy hats.

Day Three sights to see

Modern flyers might consider a few stops in Texas, starting with a detour to Denton Enterprise Airport (KDTO) for a visit to Dallas and Fort Worth. It's 35 miles northwest of the twin cities. Rent a car for a few days of sightseeing.

Sixth Floor Museum at Dealey Plaza

One of Texas' most visited sites, the Sixth Floor Museum at Dealey Plaza chronicles the life and assassination of President John F. Kennedy. The museum is located in the former Texas School Book Depository building, from where Lee Harvey Oswald shot at Kennedy in 1963.
jfk.org

The George W. Bush Presidential Library

The George W. Bush Presidential Library and Museum exhibits artifacts and presents the events of the George W. Bush administration.
georgewbushlibrary.gov

Frontiers of Flight Museum

The Frontiers of Flight Museum is located at Dallas Love Field Airport (KDAL).



The Texas State Fair is held annually at Dallas' historic Fair Park. Photo courtesy of Visit Dallas.



You can see the one and only Vought V-173 "Flying Pancake" at the Frontiers of Flight Museum in Dallas. Photo by Eric Urban / Wikimedia Commons.

Exhibits include the Apollo 7 Command Module, artifacts from the German airship Hindenburg and the only Vought V-173 "Flying Pancake," an experimental test aircraft built in 1942.
flightmuseum.com

Fort Worth Stockyards National Historic District

Mosey through the Stockyards National Historic District for a taste of the true American West. Be there for the twice-daily cattle drives and the rodeos held nearly every Friday and Saturday night.
fortworthstockyards.org

American Airlines C.R. Smith Museum

The American Airlines C.R. Smith Museum, near DFW International Airport, is one of the few aerospace museums dedicated solely to commercial aviation. Exhibits include hundreds of historical artifacts, photographs, aircraft engines and a Douglas DC-3 airliner.
crsmithmuseum.org

Fort Worth Water Gardens

Sci-fi movie fans will recognize the Fort Worth Water Gardens at the Fort Worth Convention Center. The concrete multi-level fountain was a location in scenes of 1976's "Logans' Run."

1502 Commerce Street, Fort Worth, Texas

Albany. Texas

Kern and Rinker landed in Albany the night of July 4 and checked into a hotel, "a grand old-fashioned affair with a white adobe front and Mexican tile floors." I can't find evidence of that hotel still being in operation, and Albany seems to have only one hotel now. It might be best to visit Albany, then fly 33 miles to spend the night in Abilene, or 67 miles to Sweetwater.

Fort Griffin Fandangle

If you happen to land in Albany during the last two weekends of June, attend the Fort Griffin Fandangle. This musical theater production tells the history of the region around Fort Griffin, the local military outpost. The show features old-time wagons, a stagecoach, steam train, oil derrick and a cast of more than 400 locals. The Fandangle was first performed in 1938 at the outdoor Prairie Theatre.
fortgriffinfandangle.org

Day Four, Tuesday, July 5, 1966

Kern and Rinker departed Albany at dawn and flew west, "the fabled southern route of the early airmail flyers."

"As we turned in for our first refueling stop of the morning, at Avenger Field in Sweetwater, the tail suddenly rattled and shook as violently as a truck hitting a pot-hole." The boys landed safely with thoughts that the plane was seriously damaged and they'd have to end the flight. It turned out to be just a "busted elevator spring," which was quickly replaced by a friendly mechanic. The mechanic was aware of their flight, which was the "first indication we had that there was press interest in our flight, and it had never occurred to us that we might be the youngest aviators to fly the continent."



The "Flagship Knoxville," a restored DC-3 airliner on display at the American Airlines C.R. Smith Museum at DFW airport. Photo Wikimedia.



Fort Worth cattle drive in the Stockyards National Historic District. Photo Visit Fort Worth.



Singers in period costumes perform at the Fort Griffin Fandangle, an annual outdoor theater production in the small Texas town of Albany.



After Sweetwater, they likely (Rinker doesn't say in the book) followed the road (now Interstate 20) to Big Spring, Midland, Odessa, and then turned northwest to Wink, Texas.

There, Kern was introduced to a hangar full of rattlesnakes, a practical joke by the lineman fueling their Cub. They were warned, "Don't ever cross a runway at night in Texas. Them rattlers will get you before you ever see them."

From Wink, the boys decided to leave the road below and cut directly across the desert toward Carlsbad, New Mexico. They'd cross the desert to intercept the Pecos River and follow it to Loving and Carlsbad.

Midway, they had another scare when, "Whabang, Whabang! The airframe and fabric shook. We were finished, done for, 50 miles from the nearest airport." The boys nursed the Cub onward to Cavern City Air Terminal at Carlsbad, where they again found that the noise was far greater than the problem.

"It's just the cowling gasket! It blew off in flight. It's nothing! Just some ripped fabric," exclaimed Rinker when he jumped out to inspect their plane.

A helpful local mechanic quickly fixed their problem and threw in a quick tuneup. He also warned them, "You're all over the radio. There's a bunch of reporters waiting for you in El Paso."

From Carlsbad, the boys headed southwest past Carlsbad Caverns National Park at Whites City and to Pine Springs for the most challenging leg of the journey: crossing the Rocky Mountains at Gaudalupe Pass. The boys battled extreme turbulence and used every bit of their skill to maintain 11,600 feet to get through the pass.

"The gateway to California had been breached," wrote Rinker. The boys finished the day by flying 70 more miles to the "busy general aviation airport at El Paso" to be met by a gaggle of reporters. Likely, this was West Texas Airport (T27), which was later renamed Horizon Airport before it closed.

They watched themselves on the local TV news at the posh hotel they chose to stay at and met a colorful pilot, Robert Pate, and his wife and sister-in-law. The new friends went to dinner that night, and Rinker was introduced to the margarita.

Day Four sights to see

National WASP WWII Museum

Those interested in aviation history should land at Sweetwater to visit the National WASP WWII Museum.

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DESTINATION



WASPs train at Avenger Field at Sweetwater, Texas, during World War II.

The museum exhibits collections of personal memorabilia of individual WASPs from the World War II era, and a hangar houses a Boeing PT-17—the WASPs primary trainer—and other airplanes of the era.
waspmuseum.org

Pioneer City County Museum

For more Texas history, amble into Sweetwater to the Pioneer Museum, with exhibits depicting the lives of early Texas farmers and ranchers, plus Indian artifacts.
pioneermuseumtx.org

AIRPORTS WHERE THE BOYS LANDED

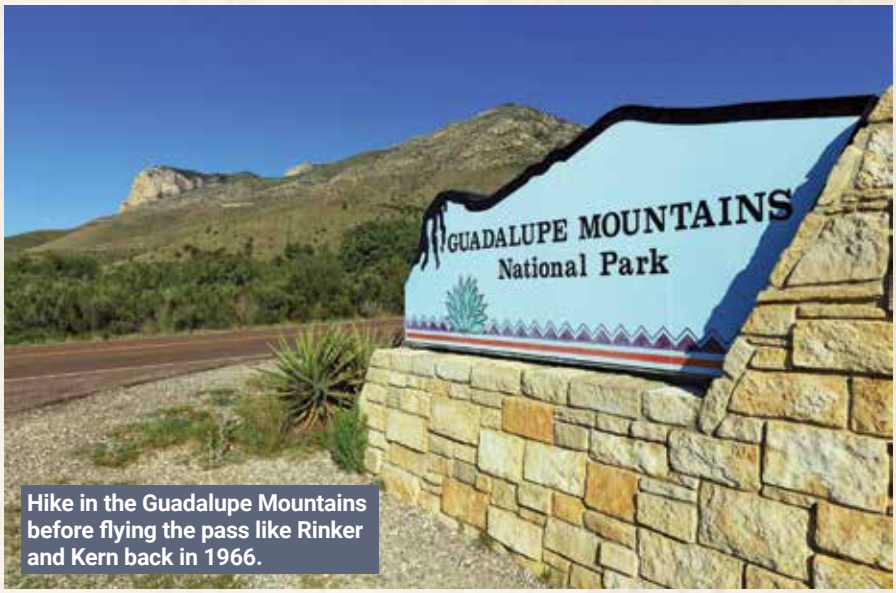
DAY THREE

- Hazen Municipal Airport (6M0), Hazen, Arkansas
- Dexter B. Florence Memorial Field (KADF), Arkadelphia, Arkansas
- Howard Co. Airport (M77), Nashville, Arkansas
- Durant Regional Airport–Eaker Field (KDUA), Durant, Oklahoma
- Decatur Municipal Airport (KLUD), Decatur, Texas
- Taylor Airport—use Albany Municipal Airport (T23), Albany, Texas*

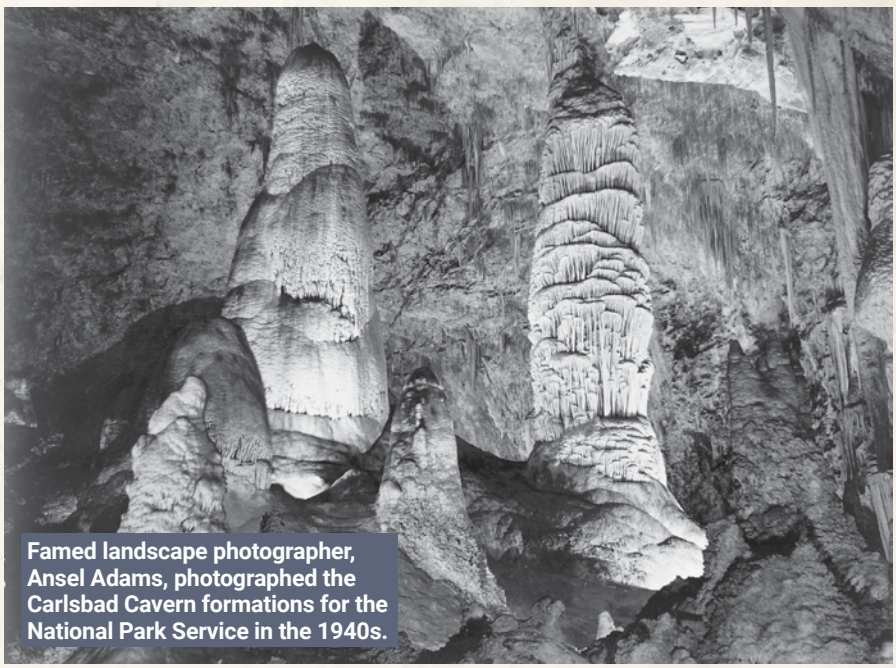
DAY FOUR

- Avenger Field (KSWW), Sweetwater, Texas
- Winkler County Airport (KINK), Wink, Texas
- Cavern City Air Terminal (KCNM), Carlsbad, New Mexico
- West Texas Airport (T27) El Paso, Texas—use Doña Ana County International Jetport (KDNA)*

** indicates airport no longer active*



Hike in the Guadalupe Mountains before flying the pass like Rinker and Kern back in 1966.


Famed landscape photographer, Ansel Adams, photographed the Carlsbad Cavern formations for the National Park Service in the 1940s.

Rattlesnake Roundup

Fans of Herpetology will want to arrive for the "World's Largest Rattlesnake Roundup," held each March at the Nolan County Coliseum. The roundup includes events such as a "snake parade," a snake-eating contest, and the longest snake competition.
rattlesnakeroundup.net

Carlsbad, New Mexico

Carlsbad, New Mexico, is primarily known for Carlsbad Caverns National Park, 18 miles southwest. The primary attraction is a large chamber named the Big Room, which is almost 4,000 feet long and 625 feet wide, the largest cave in North America. The park contains more than 119 caves, but only three are open to tour. The cave is also known for the thousands of bats that fly out every evening.
nps.gov/cave/index.htm

Guadalupe Mountains National Park

Before flying the Guadalupe pass like Rinker and Kern, see it at ground level. The Guadalupe Mountains National Park is 51 miles southwest of Carlsbad. Start your visit at the Pine Springs visitor center. Hike to the summit of Guadalupe Peak and wander the ruins of the Pinery stagecoach station. Additional sites include the Frijole Ranch Cultural Museum, a small local history museum; the ruins of

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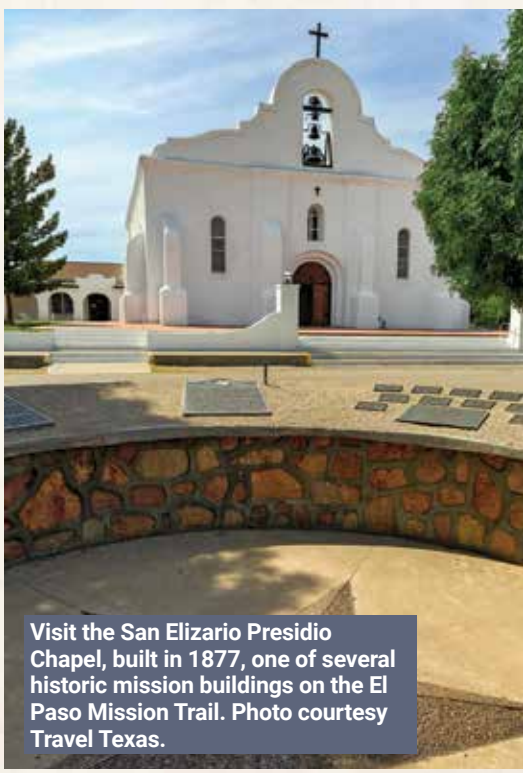
the Pine Springs Café, a roadside complex from the 1930s; and the Ship on the Desert, a 20th-century modernist house, an unusual design for Texas. *nps.gov/gumo/index.htm*

Day Five, Wednesday, July 6, 1966

The boys took a vacation day in El Paso, where they lounged by the hotel pool with their new friends. Midday, their peace was interrupted by a hop to El Paso International Airport for a TV interview their father had arranged. They called ahead to land without a radio but were told they "busted the airspace," and a ruckus ensued. After the interview, they left the plane there for the night, and everyone went south of the border for dinner in Old Jaurez, Mexico.

Day Five sights to see: El Paso

El Paso, the sixth largest city in Texas, stands on the Rio Grande across the border from Ciudad Juárez, Mexico. It's home to the Army's Fort Bliss and several historic sites. Start by visiting the El Paso Visitor Information Center at 1 Civic Center Plaza; they'll guide you to all the places worth seeing. The El Paso Historic Mission Trail features three Spanish Mission adobe churches—the Ysleta, the Socorro, and San Elizario



Visit the San Elizario Presidio Chapel, built in 1877, one of several historic mission buildings on the El Paso Mission Trail. Photo courtesy Travel Texas.

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Chapel. The Magoffin Home State Historic Site is El Paso's only historic house museum. The 19-room adobe house was built in the 1800s for civic leader Joseph Magoffin and exhibits original family furnishings.

El Paso was the heart of the Old West and was visited by numerous outlaws, including John Wesley Hardin and Billy the Kid. Visit the Old County Jail Museum (actually in San Elizario), where Billy the Kid "broke into jail" to spring a friend imprisoned there. At Concordia Cemetery, known as El Paso's Boot Hill, visit the grave of the famous gunfighter John Wesley Hardin, who was shot dead in an El Paso saloon.

The Fort Bliss Museum houses numerous exhibits of the history of the fort and the 1st Armored Division, and the fort's role in the exploration of the western states. Go to the visitor control center for a pass. Check the museum website for hours and ID requirements.

Some food writers claim that the hundreds of family restaurants in the city serve better Mexican food than anywhere else in the world.

El Paso Visitor Information Center:
visitelpaso.com/contact/vic

Magoffin Home State Historic Site:
thc.texas.gov/historic-sites/magoffin-home-state-historic-site

Old El Paso County Jail Museum:
losportalesmuseum.org/oldcountyjail

Fort Bliss Museum:
history.army.mil/museums/fieldMuseums/fortBliss/index.html

In the next installment, we'll trace the Buck boys' journey from El Paso west toward California.



Dennis K. Johnson *is a freelance writer for aviation magazines, and photographer who shoots travel photos for Getty Images and Alamy Stock Images. Based in Hoboken, New Jersey, he's an avid traveler, private pilot and owner of a vintage 1947 Piper PA-12 Super Cruiser. Send questions or comments to editor@piperflyer.com.*

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PRESS RELEASES

*Compiled from press releases

April 2023



DIAMOND – SÃO PAULO BECOMES BRAZIL'S SECOND HARTZELL PROPELLER RECOMMENDED SERVICE FACILITY

Joins Diamond Aviação's Shop in Goiânia

SÃO PAULO, Feb. 7, 2023 – Hartzell Propeller has appointed Diamond – São Paulo as the company's second Recommended Service Facility (RSF) in Brazil. It joins Diamond Aviação's shop in Goiânia, which was designated a Hartzell RSF 40 years ago.

Diamond's two facilities are recognized as the only propeller shops in Brazil appointed by Hartzell Propeller to provide technical support, service, delivery, product sales and Hartzell warranty. Both shops are owned by Licurgo and Geisa Sousa.

"In 1983 Diamond Aviação in Goiânia, Brazil was named by Hartzell as a Recommend Service Facility. Forty years later our family has had a second propeller shop appointed by Hartzell, in São Paulo," said owner Licurgo Sousa.

"It is an honor to be part of this select group of Recommended Service Facilities. The Diamond São Paulo facility will provide even better support to the southeast region of Brazil," he added.

Partnership and Friendship

"We would like to thank Licurgo and Geisa Sousa for the partnership and friendship that we have had with them for so many years," said Hartzell Propeller President JJ Frigge. "They successfully represent the very best in

Continued on Page 56

PIPER AIRCRAFT SEES STEADY GROWTH IN 2022

VERO BEACH, FL. February 22nd, 2023 – Piper Aircraft, Inc. is pleased to announce its 2022 achievements, including a 15% increase in aircraft deliveries over 2021. In addition, Piper incorporated innovative updates to their flagship aircraft, the M600/SLS, and provided support to more than 25 philanthropic organizations that best embody the company's values and mission. In 2023, Piper continues to see backlog for the M-Class lineup deep into 2024 and trainer aircraft reaching into 2025 and beyond.

The M-Class product line includes the turbocharged and pressurized piston M350, the entry-level M500 turboprop, and the M600/SLS, featuring the HALO Safety System with Garmin Autoland. In total, 69 M-Class aircraft were delivered over the course of the year. This includes 19 M350s, 9 M500s, and 41 M600/SLSs, 43 of which were delivered domestically and 26 internationally.

In the trainer lineup—including the diverse Archer family (Archer DX, DLX, LX, and TX), the value-priced Pilot 100i, and the multi-engine Seminole—Piper delivered 167 total aircraft, with 150 delivered domestically and 17 internationally. Piper saw existing flight school customers grow their fleet, such as ATP Flight School, Spartan College, and American Flyers, as well as welcomed new customers to the Piper Flight School Alliance, including Thrust Flight and Fly Gateway.

"Growth in our two primary aircraft markets is of paramount importance to Piper Aircraft," said

Piper President and Chief Executive Officer John Calcagno. “Despite the supply chain and labor challenges our industry faced this year, we were still able to deliver our aircraft as promised, create valuable enhancements across our product lineup, and pass these improvements to our Piper dealer partner network and retail customers.”

Product highlights included the M600/SLS receiving FAA approval on a Master Minimum Equipment List (MMEL), defining an easier pathway to enter the aircraft into Part 135 charter service. The M600/SLS also gained unpaved field approval in Q4 of 2022, expanding the value of an already capable aircraft. Together with these improvements, Piper Aircraft announced their collaboration with CAE to engineer an electric PA-28-181 Archer Supplemental Type Certificate.

Looking into 2023, Piper will be first to market with exciting new innovations in G3000 software on the M600/SLS, which were previewed at NBAA-BACE in Orlando, FL at the end of 2022. Piper also recently announced the integration of an Agile Manufacturing Robot to the PA-46 production line to elevate efficiency and safety throughout the Piper factory in Vero Beach, FL.

In addition to meeting the demands of the 2022 delivery schedule, Piper Aircraft saw success in other elements of the year, focused on our customers and the community. One of these efforts was the inclusion of two new flight schools to the highly successful Piper Brand Ambassador program, the L3 Harris Flight Academy, and long-standing Piper fleet customer, North Star Aviation of Minnesota State University at Mankato. Piper also presented six aviation-focused college scholarships to students in 2022, and will add three more scholarships for local high school students this year.



ELECTROAIR ANNOUNCES APPROVAL OF ITS BACK UP BATTERY PANEL SYSTEM CONTROL

Electroair is pleased to announce FAA approval of STC No. SA04586CH, “Installation of the Electroair Back Up Battery Panel System Control,” which permits the installation of the Electroair EIS Back-up Battery System (EBBS) Panel in certificated aircraft in conjunction with a 12- or 24-volt TCW Technologies Integrated Battery Backup Systems (IBBS) and dual Electroair Electronic Ignition Systems (EIS).

Now, aircraft owners have an easy-to-observe, FAA-approved panel to ensure safe, effective backup power to dual EIS installations using the Electroair EIS-42000DM and EIS-62000DM. These dual EIS are designed to replace Bendix single drive, dual magneto configurations, but owners can install dual Electroair systems on any aircraft listed in the Electroair AML.

The Electroair EBBS panel allows for control of a lightweight TCW IBBS lithium-iron-phosphate battery backup. The EBBS panel has three LED status indicators, a voltmeter, and a ready/off rocker switch. The voltmeter indicates the voltage of the backup battery system. The rocker switch enables backup battery activation when the aircraft’s primary electrical system drops below the acceptable range.

Installation of this STC requires the installation of either STC No. SA02987CH or STC No. SA03286CH (the Electroair Electronic Ignition System) and TCW Technologies’ STC No. SA04400NY (Integrated Backup Battery System).

Electroair received FAA approval for the EBBS panel STC No. SA04586CH and corresponding AML on Dec. 23, 2022. The documents below detail the STC, approved models, and the flight manual supplement for the EBBS.

STC SA04586CH
electroair.net/pdfs/air26000.pdf

FAA Approved Model List (AML) for STC SA04586CH
electroair.net/pdfs/AML%20EA-26000.pdf

Airplane Flight Manual Supplement for EIS Back-up Battery System (EBBS) Panel With Existing Dual EIS and Back-up Battery Pack
electroair.net/pdfs/afms26000.pdf

Electroair Electronic Ignition Systems (EIS)
electroair.com

TCW Technologies Integrated Battery Backup System (IBBS)
tcwtech.com/product/integrated-battery-back-up-system-ibbs/

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PRESS RELEASES

Hartzell Propeller Diamond Service Facility, São Paulo
Continued from Page 54

Hartzell Propeller support and maintenance and have done so for decades. They truly have kept the Hartzell-equipped fleet in Brazil flying."

The addition of Diamond – São Paulo as Hartzell Propeller's 25th Recommended Service Facility exemplifies the company's commitment to increase facilities around the world capable of meeting rigorous standards for customer service. In many cases, Hartzell Propeller requirements significantly exceed those of the governing airworthiness authorities.

Diamond – São Paulo

Hartzell Propeller encourages customers to use a company designated Recommended Service Facility for propeller repairs and overhauls. As a member of the network, Diamond – São Paulo and its sister shop in Goiânia provides the highest-quality propeller overhaul and repair work available, reflecting Hartzell's customer commitment to quality and performance.

WIPAIRE ANNOUNCES THE SALE OF FEDERAL FLUIDYNE SKIS



February 16, 2023 – Wipaire sold Federal Fluidyne Skis to F. Atlee Dodge in Anchorage, Alaska on February 15, 2023. "This was a natural move for us as we have been supporting ski operations in the region. With this acquisition, we will handle all the technical inquiries, parts and the associated paperwork for existing owners of Federal Fluidyne Skis and moving forward, all new customers" said Justin Johnson, Manager of F. Atlee Dodge Aircraft Services.

Exacting RSF Network Standards

Diamond – São Paulo joins a network of Hartzell Propeller RSFs located throughout the Americas, Europe, Malaysia, Australia and New Zealand. This group of affiliated facilities, with factory trained technicians and state-of-the-art equipment, ensures that owners and operators of Hartzell Propeller-equipped aircraft are only a short flight, or drive, away from the best Hartzell recommended propeller service in the industry.

To achieve Hartzell Propeller's RSF designation, Diamond – São Paulo met a number of stringent requirements, including on-site quality systems and process audits and use of factory trained and highly qualified propeller experts. In addition, the new Recommended Service Facility is required to maintain Hartzell-approved specialized propeller tools and equipment along with meeting the company's special process approvals on an ongoing basis.



Tooling, spares and associated technical documents are presently being shipped from Wipaire to the F. Atlee Dodge facilities in Alaska.

"It was a tough decision to sell the ski line, but we feel this will allow us to sharpen our focus and resources on our float products. We thank all our ski customers for their business over the years, I am certain Justin's team will do a fantastic job and wish the best for F. Atlee Dodge as they grow their business" said Chuck Wiplinger, President & CEO of Wipaire.











CLAY LACY AVIATION COMMITS OVER $500,000 TO PILOT AND MECHANIC SCHOLARSHIPS

Building rewarding aviation careers and supporting the local communities where we live and work





Los Angeles—February 28, 2023 Clay Lacy Aviation has strengthened its commitment to the future of aviation by funding scholarships in diverse areas within the industry and geographic regions. The 55-year-old private aviation company, specializing in aircraft management, charter, maintenance and FBO services throughout the U.S., announces it has raised its commitment to over $500,000 in scholarships and support to the next generation of aviation professionals.

Clay Lacy Aviation has pledged $281,000 to students through new scholarships, in addition to the $225,000 in scholarships it has granted since 2015.

"We are committed to helping talented individuals discover and thrive in this vital industry," said Scott Cutshall, SVP Development and Sustainability. "Aviation professionals build rewarding lives for themselves and their families, and it's crucial that leaders in the industry are able to support them in realizing their professional goals and career dreams."

Developing this professional pipeline helps create economic opportunities and growth for the cities Clay Lacy serves, as well. In areas where scholarship recipients are close to Clay Lacy facilities, such as Oxford, the company engages in mentoring of students,



Connecticut Aerotech School in Hartford, Connecticut.

cholarships at Orange Coast College – left to right, Cutshall, Taylor Wilson, Joey White, Stanley Harriman.



including on-site shadowing of employees, and hands-on training.

The announced scholarships include:

• Mechanic scholarships at Los Angeles Unified School District's North Valley Occupational Center Aviation Center at Van Nuys Airport.

• Mechanic scholarships at Connecticut Aerotech School in Hartford, and career training opportunities at Clay Lacy's FAA Part 145 Repair Station at Waterbury-Oxford (KOXC) Airport.

• Support for "Gold Stars to Blue Skies" program through Raider Air, supporting children of fallen U.S. Marines with earning their private pilot license.

• Women's aeronautics and technology scholarships, supporting the International Aviation Womens Association scholarship program at Vaughn College of Aeronautics and Technology in Flushing, New York.





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CORSAIR REUNION AMONG THE WARBIRDS HIGHLIGHTS AT EAA AIRVENTURE OSHKOSH 2023



Events also feature major motion picture "Devotion" playing at Fly-In Theater

EAA AVIATION CENTER, OSHKOSH, Wisconsin — (February 17, 2023) — A reunion of the Chance Vought F4U Corsair aircraft, the unique gullwing fighter aircraft best known for its exploits off U.S. aircraft carriers, will be among the warbird highlights at EAA AirVenture Oshkosh 2023. The 70th edition of the Experimental Aircraft Association's fly-in convention is July 24-30 at Wittman Regional Airport in Oshkosh, Wisconsin.

"With only about two dozen flying examples of the Corsair remaining in North America, the opportunity to bring together the largest-possible group of these unforgettable aircraft at Oshkosh was one we had to organize," said Rick Larsen, EAA's vice president of communities and member programs, who coordinates AirVenture features and attractions. "This airplane recently marked the 80th anniversary of its introduction to the U.S. military and remains a favorite warbird among many enthusiasts. Our goal is to create a memorable program with several activities that feature the Corsairs on ground display and in the air."



Corsair owners are encouraged to join this unique reunion by contacting Chris Henry at the EAA Aviation Museum (CHenry@EAA.org) for further details and registration information.

The Corsair received heightened attention at the end of 2022 with the release of the major motion picture "Devotion," which recognized the Korean War exploits of Medal of Honor recipient Thomas Hudner and his wingman Jesse Brown, the first Black U.S. naval aviator. That movie will be played during AirVenture at the event's Fly-In Theater, with descendants of the Brown and Hudner families invited to participate.

In addition, visitors will have the opportunity to visit the newly opened Corsair display inside the EAA Aviation Museum, which is open to all attendees as part of their AirVenture admission. The exhibit honors both Brown and Hudner, including a Corsair flown by Hudner on his subsequent deployments in the early 1950s and painted with his VF-32 squadron markings.

The Chance Vought F4U Corsair was first flown in 1940 and introduced to the U.S. military on December 28, 1942. Its unique gull-wing design came as a way to allow use of the powerful Pratt & Whitney R2800 Double Wasp engine and allow shorter, more rugged landing gear for use as a carrier-based aircraft. With those attributes and a top speed of more than 450 miles per hour, the aircraft became renowned as a naval aviation fighter and in support of ground forces.

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QUESTIONS & ANSWERS

Continued from Page 21

On June 14, 2021, the Chemtool plant owned by Lubrizol went up in flames. That plant produced much of the grease sold and used in the United States, and this explains the extreme shortage of AeroShell Grease 6.

manufacturers' service information to maintain airworthiness.

We don't have this problem, but it's still a problem. According to the experts at Sullivan Propellers in Hayward, California, there is a caveat to the service manual's call-out for repetitive greasing.

Hartzell calls for squirting 1 ounce (30 ml) of grease into the prop hub every 100 hours or at each annual. According to the prop folks at Sullivan, it's possible to overfill the amount of grease in the prop. The 1-ounce rule is appropriate if the prop is removed at the Hartzell-recommended time between overhaul (TBO) of 72 months.

This seems to suggest that if you have been diligent about pumping the correct amount of grease into your propeller up to this point, you're probably not going to hurt the prop by not greasing it repeatedly until an alternate grease is identified. Check with your mechanic.

The Hartzell manual says that you can use AeroShell 5 instead of AeroShell 6; they both utilize a mineral-based oil with the same thickening agent. But if you use the AeroShell 5, a placard must be applied to the instrument panel indicating that flight is prohibited if the outside air temperature (OAT) is less than -40 F (-40 C). That's not very helpful, since AeroShell 5 is also scarce.

The "new" grease Hartzell is using in its constant-speed props is NYCO GN3058. It's a much better grease (being synthetic white lithium complex hardened, versus Aero Shell 6, which is grease composed of a mineral oil thickened with Microgel®), but AeroShell greases and NYCO greases can't

be mixed. And there is no way to remove the older AeroShell grease without splitting the hub, and it can't be done in the field.

An internet search seems to indicate that some vendors are now advertising the re-availability of AeroShell 6. Let's hope so.

Happy flying,
Steve

IMPORTANT: This article describes work that may need to be performed/ supervised by a certificated aviation maintenance technician. Know your FAR/AIM and check with your mechanic before starting any work.

Steve Ells *has been an A&P/IA for 45-plus years and is a commercial pilot with instrument and multi-engine ratings. Ells also loves utility and bush-style airplanes and operations. He served as associate editor for* AOPA Pilot *until 2008. Ells is the owner of Ells Aviation and the proud owner of a 1960 Piper Comanche. He lives in Templeton, California. Send questions and comments to editor@piperflyer.com.*

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AIRCRAFT SPRUCE AND SPECIALTY
aircraftspruce.com

WAG-AERO
wagaero.com

OTHER

AEROSPACE WELDING
awi-ami.com

LOREE AIR INC.
loreeair.com

ADDITIONAL READING

AC 43.13-1B (FAA COMPASS SWING DOCUMENTATION)
faa-aircraft-certification.com/support-files/ac43_13_1b_sec_3.pdf

DUNCAN AVIATION (COMPASS SWING PROCEDURE)
blog.duncanaviation.com/aircraft-compass-system-alignment-formulae

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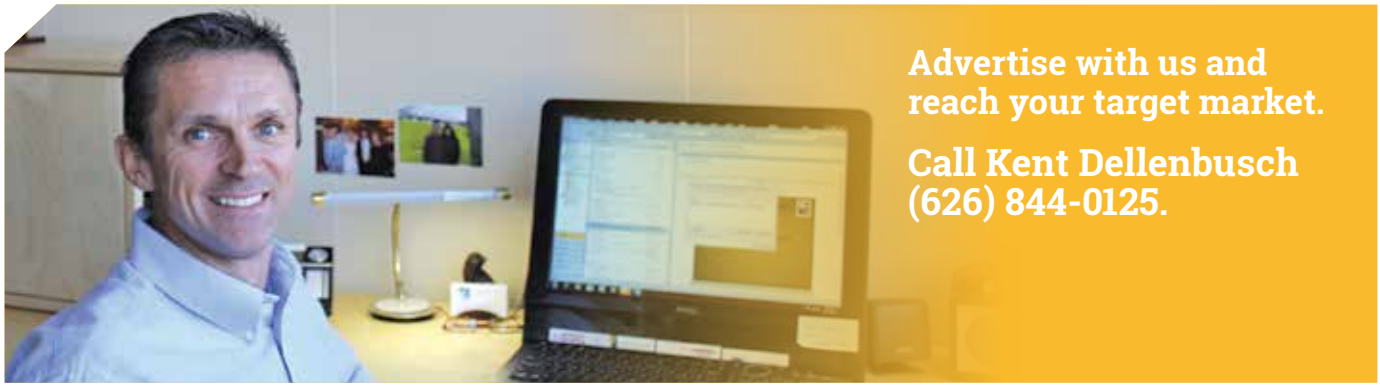
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Online Forums piperflyer.com/forum

Our online forum, located within the association website, is a great source for question-and-answer interaction and an excellent way to converse with other members, the PFA staff, and Piper Flyer's contributing editor, longtime A&P/IA, Steve Ells.

Piper Flyer Association member event

Email kent@aviationgroupltd.com
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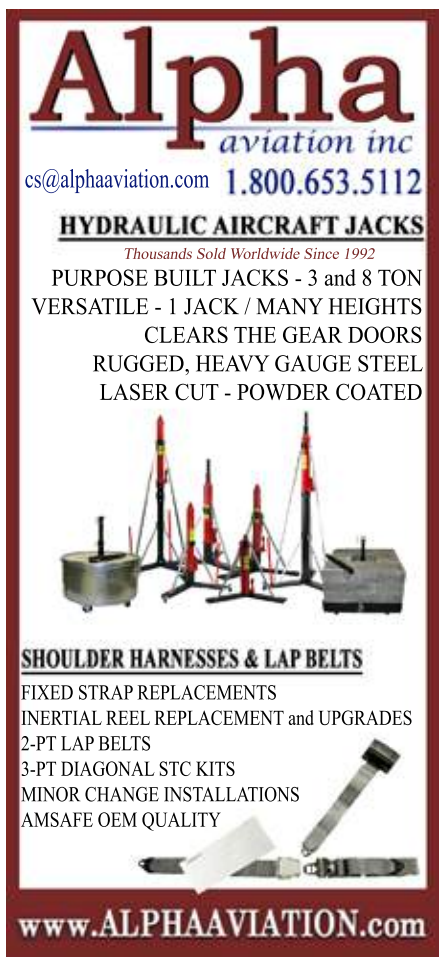
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THIS MONTH IN AVIATION HISTORY



APRIL 1

1918 — The United Kingdom's Royal Air Force is born. It is formed out of the Army's Royal Flying Corps and the Royal Naval Air Service.

APRIL 4

1947 — The International Civil Aviation Organization (ICAO) is officially founded in Montréal, Canada. It is an inter-governmental organization established to regulate air transportation on a worldwide basis, its authority restricted only by the number of signatory nations.

APRIL 6

1924 — The first successful flight around the world begins as four Douglas World Cruisers leave from Seattle, Washington. Of the four, only two complete the circumnavigation. Each flies 27,553 miles (44,340 km) in 175 days and returns to Seattle on September 28. The actual flying time is 371 hours, 11 minutes, and the successful pilots are Lt. Lowell H. Smith and Lt. Erik Nelson.

APRIL 8

1931 — Amelia Earhart climbs to a then-record-altitude of 18,415 feet in a Pitcairn Autogiro at Willow Grove, near Philadelphia.



Amelia Earhart

APRIL 11

1921 — A bill is introduced into the House of Representatives by Julius Kahn to regulate air navigation within the United States and its dependencies and between the United States and any foreign country.

1921 — Bill 2815 is introduced in the House of Representatives by Frederick C. Hicks, creating a Bureau of Civil Aviation in the Department of Commerce.

APRIL 12

1921 — President Harding, in his address to Congress, recommends the establishment of a Bureau of Aviation Department in the Department of Commerce for the Federal regulation and encouragement of air navigation.

APRIL 21

1928 — Australian explorer Hubert Wilkins and his American pilot Carl Ben Eielson arrive in Spitzbergen, Norway, after making the first-ever crossing of the Arctic by airplane. They left Point Barrow, Alaska, on April 15th in their Lockheed Vega.



Hubert Wilkins and Carl Ben Eielson with their ski-equipped Lockheed Vega.

APRIL 22

1920 — Pacific Aeronautical Association urges Congress to establish transcontinental airmail lines, air laws, regulate aviation in general, encourage cities to establish municipal landing fields, and aid development of commercial planes.

APRIL 23

1939 — The United States Civil Aeronautics Authority raises the eligibility age for obtaining a private pilot license to 18 years, from the previous 16 years of age.

APRIL 27

1920 — First warrant in the United States for reckless aerial driving is issued in Los Angeles against Omer Locklear, Aero Club of Southern California, complainant.

APRIL 30

1932 — An international code of air traffic communication is formally established. The new code is based on a series of three-letter codes starting with the letter Q.

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