# TWIN & TURBINE

FOR THE PILOTS OF OWNER-FLOWN, CABIN-CLASS AIRCRAFT

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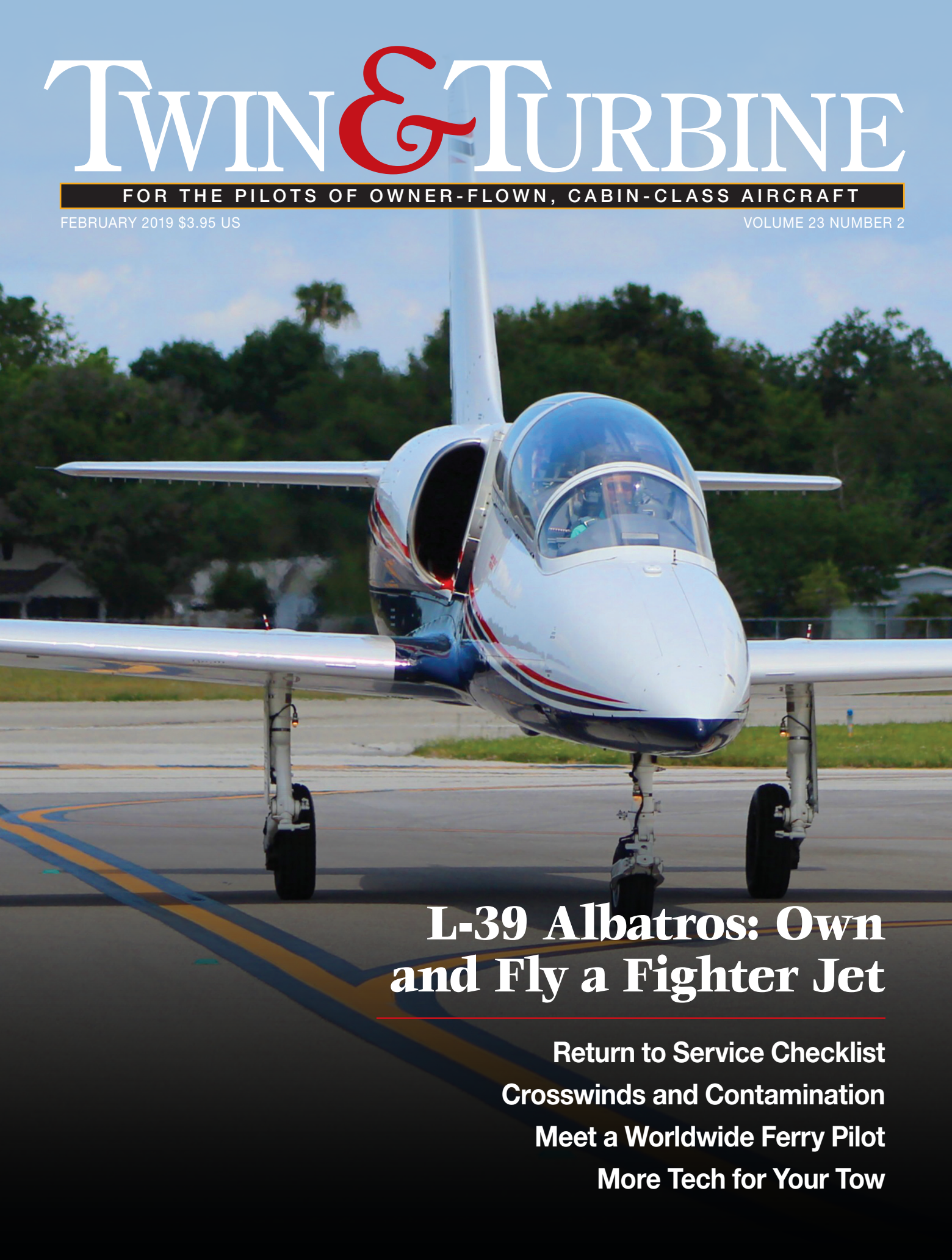

## L-39 Albatros: Own and Fly a Fighter Jet

Return to Service Checklist

Crosswinds and Contamination

Meet a Worldwide Ferry Pilot

More Tech for Your Tow

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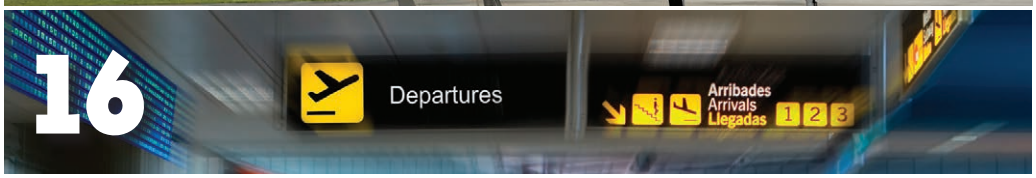







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by **Rebecca Groom Jacobs**

# 2019 Optimism

Each month my local aero club, the Wichita Aero Club (WAC), hosts a luncheon where dozens of industry professionals, pilots and city leaders congregate to foster and promote aviation, both locally and nationally. I have attended a number of these luncheons over the past few years and find it to be a fantastic networking and learning event – as well as a nice reminder of the comradery that exists among this great city, aptly dubbed the "Air Capital of the World."

Typically the luncheons feature a guest speaker as a part of the program, often having traveled a far distance to take the floor and speak to his or her aviation specialty or business. During December's luncheon, there was not only one, but five esteemed guests featured during WAC's "ON-AIR Summit." This annual panel-style event is held to gain insight directly from industry leaders regarding aviation's most pressing news and issues.

We heard from the heads of some of aviation's most prominent organizations: Jack Pelton, president and CEO of EAA; Ed Bolen, president and CEO of the National Business Aviation Association (NBAA); Pete Bunce, president and CEO of the General Aviation Manufacturers Association (GAMA); Tom Haines, senior vice president, media and outreach of the Aircraft Owners and Pilots Association (AOPA); and Paula Derks, president of the Aircraft Electronics Association (AEA). The session was moderated by Aviation Week's Molly McMillin and covered a wide array of topics including market stability, the ADS-B mandate, product certification, what's next on Capitol Hill, and outlook opinions on the future of aerospace.

The group first reflected on the challenges seen in the decade following the Great Recession. EAA President Jack Pelton, who was the CEO of Cessna in 2008, jokingly admitted to "recurring nightmares" from those days. He recalled customers visiting the factory to see their on-order airplanes, yet unable to take delivery due to the financial downturn. NBAA President Ed Bolen brought up the unfortunate timing for NBAA's 2008 convention, which occurred the same week the stock market sank to its lowest levels in recent history. When the discussion shifted to the current economy and market, however, Bolen's outlook for the future was bright.

PHOTO COURTESY OF VISUAL MEDIA GROUP

"I sense that 2018 is going to finish as a strong year for a lot of companies. Flight hours are up while the level of used aircraft inventory is down," said Bolen. "There is enthusiasm that 2019 may well be better."

The other four panelists echoed this positive sentiment pointing to a much-improved economy, tax incentives from bonus depreciation, ADS-B sales (which often leads to additional technology sales), and increased aircraft values across both piston and turbine products.

"We see people investing a lot of money in legacy airplanes – certainly from an avionics standpoint, but also paint and interior," said Haines. "The shops are all backed up, and aircraft values have gone up significantly over the past year."

This is fantastic news for aviation companies and aircraft owners alike. A positive trend that I think is reflected in the recent uptick in attendance at trade shows like EAA AirVenture, which boasted record-breaking attendance in 2018.

ADS-B was another hot topic as the countdown for compliance officially transitioned from years to months. AEA President, Paula Derks, referenced the FAA's estimate of 161,000 total GA aircraft in need of ADS-B equipment. At the time of the luncheon, it was estimated 100,000 of those aircraft remained unequipped. She believes it is highly unlikely each one will meet the deadline of December 31, 2019.

"We can understand owners' hesitation, but the FAA has continually made it clear this mandate will not be extended," said Derks. "The difference between the ADS-B mandate and past mandates is this is a modernization of our nation's airspace system – everyone is involved…and the ones who are equipped, are already seeing the benefits in traffic and weather."

The above is just a small taste of the panel's compelling hour-long dialogue, but I ultimately walked away encouraged. Fortunately, the event was recorded, and I recommend all aviators, owners and aviation professionals watch and listen to the discussion in its entirety. The video can be found online at *www.wichitaaeroclub.com*. T&T

# Airmail

## In Response to Kevin Ware's "A Medical Look at Hypoxia" (December)

I enjoy your articles in *Twin & Turbine* and had a question regarding your most recent. After flying a Baron 58 for 22 years, I recently acquired a JetProp and enjoy it immensely. My aircraft is equipped with an emergency O2 bottle right behind the co-pilot seat. As you pointed out, supplemental oxygen via cannula can be a great help. My question is, do you have any specific recommendations for an oxygen system that I can place behind my seat and provide a decent flow via nasal cannula that is easily portable and easy to refill? It would be my preference to leave the emergency system intact and fully charged. I still have the oxygen saver and mustache cannula with flowmeter that I used with the Baron. The systems I looked at online seemed quite bulky and quite costly for what they provided. What's your best advice? Thanks.

Stuart Bloom

***Kevin Ware Reply:*** Congratulations on the JetProp purchase. I would buy something like the nine-cubic-foot Sky Ox tank from the likes of Sporty's. It will give you more than 10 hours at the low flow you will need and weighs only 7 pounds. Over time, I have purchased a couple of tanks of that general type. I have also used medical-type portable O2 tanks, which also worked well.

Get all refills done through whatever O2 supplier your hospital is using. At my last hospital, their supplier was the local welding place, and they filled up all my, by comparison, silly little tanks for around $7 each.

## In Response to Kevin Ware's "A Medical Look at Hypoxia" (December)

Great article on the potential for hypoxia even though ensconced in a nice pressurized cabin. I was wondering about just one thing: You mention using a portable medical oxygen tank and say it will work just fine in a heated cabin. I know you were referring to potential moisture freezing, but it caused me to wonder about something else: If the cabin depressurized and it was suddenly at 28,000, is the "medical" bottle rated for that? Or higher? At 30,000 feet, the atmospheric pressure is less than 30 percent of what it is at sea level. Does that have any impact on the integrity of the bottle? Are there differences in the construction of the valves or bottles between the portable medical bottle and the bottle specifically designed for aviation uses? (And for all I know, they might be exactly the same).

Ken Karas

***Kevin Ware Reply:*** Good question. The suggestion in the story, however, was not necessarily to buy a "medical" bottle, but rather have the portable aviation bottle, presumably purchased from the likes of Sportys, filled by a medical supplier.

Having said that, and having been around medical O2 bottles for most of my professional life, there has never been any difference I could see between the two. I have personally used them interchangeably without any problem up to FL220 in unpressurized aircraft. I would defer, however, to someone more expert on the specifics of O2 bottle construction than myself. Thanks for the feedback.

by **Dianne White**

# Return to Service Checklist

*Getting back in the saddle following an extended break.*

A few years ago, I began experiencing discomfort in my hips while running. I was training for a half-marathon – my favorite distance race – and was struggling through my weekly mileage goals. Thinking it was a pulled or overworked muscle, I treated it with heat/cold packs, stretching and copious amounts of Advil. Then it started to affect my lifestyle, of which aviation is a big part. Squatting down to look at the underbelly of my plane or to pull a fuel sample became a painful exercise. Loading luggage into the baggage compartment was done with gritted teeth. Climbing up a ladder to clean the windscreen just…hurt.

One morning at the gym, a friend (and physical therapist) watched me painfully attempt to get through my workout and commented, "You need to visit an orthopedic doctor…I don't think your problem is muscular." Much to my chagrin, she was right. Thanks to an unfortunate confluence of heredity and years of wear and tear from running and tennis, osteoarthritis had rendered my hip joints trashed. After a futile attempt to stave off the inevitable with cortisone injections and physical therapy, I surrendered to the reality that I needed new joint hardware. Another hard reality: no more running, tennis or any "high-impact" activity.

So, in 2015, I replaced my left hip. In December 2018, I replaced the other. As I write this, I am on the eve of getting my doctor's sign-off from all restrictions, allowing me to return to the driver's seat and the left seat.

From the FAA's perspective, there's no specific time that is required to self-ground following joint replacement surgery. You can resume flying as soon as your surgeon releases you for unrestricted activities and you feel well enough to fly. At my next flight physical, I'll need to bring my hospital records and a current, detailed status report from my orthopedic surgeon with my prognosis.

I'm go for launch, right? But after a two-month layoff, I hear a whisper of caution. It could be the voice of prudence, or perhaps my inherited Missouri horse sense. Before I jump in an airplane (or more accurately gingerly step) and go boring off into the sky, I stopped to consider if perhaps there was a smart way to return myself to service. To inform my strategy, I reached out to three highly respected CFII's and aviation safety thought leaders to see what would be on their "return to flight" checklist.

First, I talked to master instructor and three-time "CFI of the Year" David McVinnie, who also serves as a FAAST representative and on the MMOPA Safety Committee. He had this to say: "Prior to the break, you probably used flows for most of your airborne duties. So, sit down and dry run the checklist line-by-line to refresh your memory – in the cockpit is preferred. If you have a ground power unit, all the better. Make your first flight a short, fun VFR hop. Pick a good friend/CFI to accompany you on the first couple flights. If you haven't been right-seating during the break, do a flight or maybe two to reacquaint you with the environment. Finally, avoid external pressure flights like an Angel Flight mission at first."

Tom Turner, who is executive director of the ABS Safety Foundation and who has performed many of my past IPCs, suggested: "First, check that you're able to enter and exit the cockpit OK, and that while belted in, you have the flexibility to easily reach the controls, fuel selector and other rudder pedals, etc. Importantly, are you able to manually extend the landing gear? A lot of post-op people would be in a lot of trouble if they had a simple gear motor failure because they didn't consider this. From there, go fly with a pilot or CFI in the right seat. Go through the basic maneuvers and stall series to see if you can fly to at least private standard. If that works, fly some approaches

under the hood. This will let you know if you're rusty enough you need more dual and an IPC."

Next, I had a conversation with my friend Joe Casey (ATP, CFII, DPE and chair of the MMOPA Safety Committee) who offered me this advice: "I'd definitely return to the cockpit as soon as possible. I'd suggest you return on a day when the winds aren't blowing so much that a big pedal input is required, and I might not fly a multi-engine airplane that would require a big pedal input if an engine failed. I think you know your body better than anyone: If you think you cannot handle a worst-case scenario, then wait. Taking along a CFI or some other competent right-seater on your first flight is a cheap insurance policy."

Finally, I talked with 35-year CFII and former airline captain Bill Archer, who has more than 30,000 hours in his logbook. His thoughts: "Back when I was at a major airline, we used a process that I still apply now when asked to help someone get current and comfortable with flying again. First, we'd sit down with his or her logbook to figure out what we needed to do legally per the FAR's, such as IFR currency, night currency and landing currency. Then we make up an individual training plan (ITP) on what it will take to get the pilot current and proficient. While returning a Part 121 pilot to service is quite involved, what I stress to the Part 91 pilot is that my goal is to help them become as good as they were before they experienced their loss of flying privileges."

Wow, all great advice! Being a list person, I took their input to put together my individual "return to flight" plan:

1. Review my currency, checklists, emergency checklists and memory items. Review my notes from past recurrent training and IPCs to jog my memory of my particular tendencies and failure trends;
2. Fly right seat as a safety pilot while my pilot-spouse does practice approaches. This will refresh my brain to IFR procedures, button-pushing, radio work and flows;
3. Sit in the left seat while on the ground and review checklists and flows;
4. Take along a competent pilot/CFI on a calm VFR day to brush up my stick-and-rudder skills;
5. If the above goes well, don the foggles and shoot some approaches.
6. If #5 does NOT go well, call my CFI and get an IPC scheduled ASAP.

If you're a Type A owner-pilot like me, we tend to often find waiting a frustrating but often necessary exercise. (Like waiting out weather or waiting for this stupid hip to heal.) Formulating a return to flight plan not only gave me a roadmap to safely to return to flying, it provided tangible goals I can methodically tick off.

By the time you read this, I expect to be back in the saddle. Although I've hung up my running shoes, I'd much rather fly my fine steed than hit the road any day. Giddy-up! T&T

**Dianne White** *can be contacted at* **editor@diannewhite.com**


# When the Rubber Doesn't Meet the Road

by **Joe Casey**

We've got a problem in the twin and turbine world, and I predict this problem is going to cause the demise of many nice and flyable airplanes this winter. What is the problem, you ask? Pilots accepting contaminated runways with a crosswind. I've preached about this issue to clients during training events for years, yet pilots continue to end up in a snowbank or a ditch in perfectly good airplanes. I usually get a call shortly after the event and the pilot feels terrible, knowing the limits were pushed and immediately understands his or her error within a short discussion.

I believe the solution to this problem comes from a better understanding of the aerodynamics associated with a takeoff or landing and then applying that knowledge to the real world. So, let's dissect a landing with hopes of casting light on both the problem and the solution. Hopefully, the flight instructor community can collectively preach this same sermon and we can reduce the numbers of airplanes that leave icy runways this winter.

There are effectively four ways that a pilot can interface with the medium in which the airplane operates (air): ailerons, elevator, rudder and power. I know I'm going to a get chorus of corrections from those who feel that I left out the lowly flaps (if installed), spoilers (if installed) and trim tabs. But, those flight controls are either secondary controls (flaps and spoilers), or only relieve control pressures (trim tabs). Reduced to the lowest common denominator, the ailerons, elevator, rudder, and power are the controls that must be managed in the heat of the moment to make a good (and safe) takeoff or landing.

The question is: What do those flight controls do during a takeoff or landing? Most pilots move the flight controls intuitively, meaning without much robotic action, and hopefully, that intuition is based on appropriate experience and honed by good instruction. We have a whole generation of pilots who learned to fly in directionally stable airplanes on the ground which means many pilots have a basis of experience that will fail them if the airplane suddenly becomes directionally unstable – this can happen in the blink of an eye with a contaminated runway and a crosswind.

The long debate over pitch and power is not going to be solved with this article. In fact, I'm not going to address pitch and power in this article for they are not applicable to my final point. Rest assured, I shall tackle that ginger subject in a future article. For this discussion, the proper use of the aileron and rudder is the focus.

When an airplane is on a long final approach (more than 200 feet above the touchdown zone), the ailerons and rudder have distinctly different responsibilities than when the airplane is on a short final. While on a long final, the ailerons are holding a heading and the rudder is simply ensuring coordination. If any crosswind exists, the airplane will be in a crab, with the heading of the airplane being determined by the pilot to defeat the crosswind. An airplane with a slow speed will have a bigger crab angle, and a faster one will have a smaller crab angle. A stronger crosswind will require a bigger crab angle and a lesser crosswind will require less crab angle. Easy, right? Yes, easy.

But, what do the controls do during a short final? At some point in the approach, usually about 100 feet (or so) above the runway, the pilot must make a mental shift and reposition the flight controls differently. The pilot must align the longitudinal axis of the airplane (line from nose to tail) with the alignment of the runway. So, the rudders have one (and only one) responsibility when landing: align the longitudinal axis with the runway. If a crosswind exists, the pilot must apply rudder pressure downwind to align the longitudinal axis with the centerline. When this rudder input is made in a crosswind, the airplane will drift from centerline unless something counters the effect of the crosswind. That something is the ailerons.

Ailerons correct for drift, and they do so by banking the wings and creating a horizontal component of lift. How much aileron does a pilot apply into the wind? Answer: Whatever it takes to keep the airplane on the centerline. A big crosswind component will require more bank (forced by aileron control) and a small crosswind will require less bank. In other words, if the airplane lands off the centerline, the pilot flew the ailerons poorly. If the longitudinal axis is not aligned with the runway alignment at touchdown then the rudder was flown poorly. Still easy, right? Yep, still easy. It's piloting 101.

Now, when the pilot touches down, the tire on the side where the wind is coming from should touch down first due to the banked airplane. Remember, the pilot is holding aileron into the wind to defeat



that wind, so that bank is keeping the airplane from drifting. So, a one-wheel landing on the up-wind tire is mandatory if the landing is to be done correctly.

What keeps the airplane from drifting downwind after the downwind tire (the second tire) touches down? The answer is NOT the ailerons, for the wings are now level and the horizontal component of lift is non-existent. The correct answer is rubber contact with the surface. That's right, the friction of the tires to the ground is the only thing keeping the airplane on the centerline, and the rudder now has the job of controlling the direction of the airplane. Once the nosewheel touches down, there's even more rubber helping to keep the airplane going straight. The nose wheel becomes more and more important for directional control as the rudder becomes less effective with decreasing speed.

Having said all this, here is my primary point with this article: If ice exists on the runway and a crosswind landing is attempted that has a side-force that exceeds the coefficient of friction of the tire to the surface, the airplane will drift with the force of the wind. Remember, the only thing keeping the airplane directionally stable once the aerodynamics stop is the friction of the rubber on the ground. If a layer of ice exists, all bets are off. You might stay on the runway, and you might not.

If the ice between your rubber and the ground is "black ice" (which has virtually no coefficient of friction), you are just a passenger, and I hope you are a fortunate passenger riding in an airplane that stays on the runway. If it's slushy ice with a moderate coefficient of friction, you'll have some control, but there is no way to know for sure.

How much coefficient of friction do you have exactly? A pilot can get a clue at some of the big airports from braking-action reports, which give us an idea of what we're going to experience. There's also reports from other pilots who used the runway shortly before you which is super valuable information. But, wind and ice can create very dynamic situations, and there are no assurances that the conditions have not changed. At smaller airports, it's most often a guessing game. Don't guess wrong.

I remember once landing a Saab 340 at the super long, super wide Runway 33L at KSPS (Sheppard AFB/Wichita Falls, TX). We had a full load of passengers and winter had arrived with much fanfare: ice, snow and plenty of wind. The nighttime touchdown was uneventful, but then came the rollout. As the Saab slowed on the rollout (certainly under 40 knots), the airplane started to slide. If you never been in a sliding airplane, it is one of the strangest and most disconcerting feelings ever. It's a helpless feeling, where time slows to a turtle's pace and gives you pause to think to yourself, "Why did I try this landing?! Please don't go in the ditch!" The enormous width of that particular runway saved my bacon for the airplane did not leave the runway, but when it finally stopped, the Saab was pointing into the wind, off centerline and two wide-eyed pilots were staring at each other in disbelief. I proceeded to crawl the airplane to the terminal for fear that I'd lose control again.

In the PA46 world, we usually lose two airframes (or more) each year to landing on contaminated runways with crosswinds. I suspect other airframes have commensurate losses. All of these accidents are avoidable. Simply put, if there's a contaminated runway and a crosswind, do not land there. Find a runway aligned with the wind.

An off-runway event almost always results in a prop-strike, a wing ding or a nose gear collapse. Rarely does anyone get seriously injured, but the insurance claims are always high. It'll cost you downtime, hull-value loss and betterment (a nasty little word in the insurance world that most owners are not prepared for in an insurance claim).

Of course, on an icy runway, there's also the threat of a FOD event, minimized braking effect and reduced visual cues. And all of those can cause serious problems that lead to an accident. But, the problem I see more often than not in the twin and turbine world is the attempted landing on a contaminated crosswind runway.

All of the above applies to a takeoff as well. If you understand the ground dynamics and aerodynamics of an approach and landing, you can apply that understanding to a takeoff and arrive at the same conclusion. That conclusion is that rubber-to-ground friction is also required for a safe takeoff. If ice is present and a crosswind exists, find another runway or put the airplane back in the hangar. It's better to be conservative and fly another day than to attempt a crosswind takeoff on ice and end up in the ditch. I promise you'll make headlines with your accident, and not the headlines you were hoping to make. T&T

**Joe Casey** *is an FAA-DPE and an ATP, CFI, CFII (A/H), MEI, CFIG, CFIH, as well as a U.S. Army UH-60 standardization instructor/examiner. An MMOPA Board member, he has been a PA46 instructor for 16-plus years and has accumulated 12,000-plus hours of flight time, 5,500 of which has been in the PA46. Contact Joe at: www.flycasey.com, by email at* **joe@flycasey.com**, *or by phone at 903.721.9549.*

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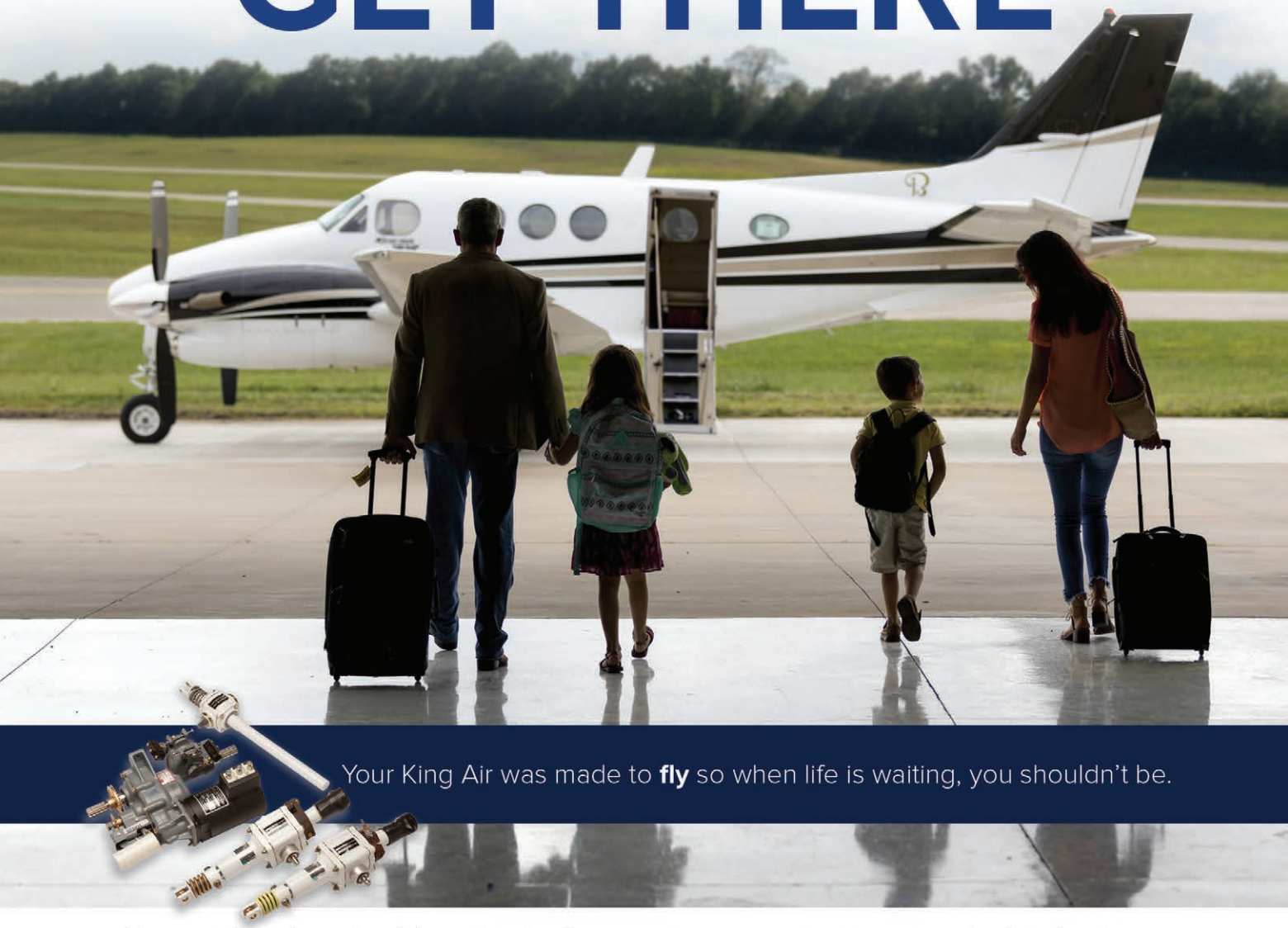



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# Jet Journal


The dream of flight began when we became enviously aware of our avian cohabitants. Pilots who have achieved this dream are summoned by a siren song offered in various meters. Some are drawn to a remote terminus difficult to reach by commercial carriage (traveling without interaction with TSA is a major benefit). Many merely love to fly, enjoying the journey as much, if not more, than the destination. I count myself among this latter group, a subset of which includes adrenaline seekers and aficionados with aerobatic intentions. My rabid ilk chases speed and acceleration and enjoys the challenge of the perfect whifferdill.

There is a suitable aircraft for every mission. Travelers need speed, reliability and luggage space. Those hungry for the next hundred-dollar hamburger just need wings. For aerobatics, it is a purpose-built craft that can sustain increased flight loads. For the last 43 years, I have been privileged to experience aviation as a pilot, airplane builder, aircraft mechanic, Flight Instructor and FAA examiner. From this perspective, I am confident in saying that if you want to not only fly fast but also upside down, a most excellent option is the Aero Vodochody L-39 Albatros.

# L-39 Albatros:
## Own and Fly a Fighter Jet

by **Dan Greenwald**

### Background

The L-39C Albatros is a high-performance jet trainer designed in Czechoslovakia in the 1960s – one of the very first to be equipped with a turbofan powerplant. More than 2,800 were built, some of which were deployed for combat in the –ZO configuration with heavier wheels and brakes and extra hardpoints under the wings.

Ruggedly designed for operations from unimproved fields, the L-39 has proven to be a reliable machine well-suited for a civilian role as an aerobatic PLJ (personal light jet). Currently, 234 L-39 jets are registered in the United States, making the Albatros one of America's most popular jet warbirds.

The L-39 has serious ramp appeal. With its sharply tapered nose, narrow fuselage, and twin over-the-wing air intakes, it looks like it is built to go fast. The top of the tail is more than 15 feet above the ground, and the almost 40-foot length is balanced by 31-foot wings mounted to the aft fuselage. Wingtip fuel tanks and duel needle-like pitot-static masts complete its distinctive appearance. Large bubble canopies enclose front and rear cockpits. The aft seat is elevated, so both pilots enjoy tremendous visibility. The cockpits are roomy, and with adjustable rudder pedals and electric seat elevation controls, pilots of all sizes can be comfortably accommodated. For aircraft equipped with hot ejection seats, there is an adjustment for pilot weight.

The L-39 is sturdy and simple to operate. High over-the-wing air intakes minimize the risk of FOD (foreign object damage) when operating on and off unimproved strips. Landing gear, flaps and spoilers are hydraulically activated by an engine-driven pump that supplies constant pressure to main and emergency circuits. If the pump fails and main system pressure is depleted, there is a pilot-operated interconnect that allows gear, flaps and

▲ Front and rear cockpit of Greenwald's L-39. For a pilot with jet experience, an L-39 type rating can be accomplished with no more than a few hours of transition training. For those new to jets, plan on 10-15 hours depending on aptitude and prior experience.

brakes to be activated from the emergency circuit. Dual accumulators store additional hydraulic energy and serve as dampeners for pressure fluctuation during operation.

Electricity is supplied by a large generator backed up by a ram air turbine generator (RAT) that automatically deploys from the aft lower fuselage in case of generator failure. In many aircraft, this heavy system is removed and electrical back-up is provided by a battery bank in the nose with up to 5,200 amp-hours of reserve. The battery bank helps maintain weight and balance since the aircraft tends to be tail-heavy when armaments are removed. Maximum amperage for all systems never exceeds 50 amps in flight, so the large batteries provide more than enough emergency power.

One of the more interesting systems is the Saphir 5 starter unit. This is a stand-alone jet engine that supplies air power to start the AI-25TL engine. The Ivchenko powerplant is a low bypass (1.7:1) turbofan that supplies 3,800 pounds of thrust. The engine is protected by an RT-12 EGT Limiter that interrupts fuel flow in an over-temperature situation. An override switch deactivates the RT-12 for emergency fuel delivery. Fuel is carried in the fuselage (290 gallons) with standard wing tip tanks holding an additional 54 gallons. The five interconnected fuselage fuel tanks require patience when fueling; the last 5-7 gallons are added slowly as the tanks will slowly "burp" trapped air when almost full. A 3-gallon dedicated "negative G" fuel reservoir allows no more than 20 seconds of inverted flight. Auxiliary fuel tanks can be fitted under the wings and in the fuselage. Fuel management is automatic, with bleed air pressure driving fuel from the tip tanks to the main fuselage tank. An electric low-pressure pump takes over from there to feed the engine's high-pressure injector. Bleed air is also used to pressurize the cockpits. This is done automatically to a max pressure differential of 3.5 PSI for a 12,500-foot cabin at 21,000 ft. Above this altitude supplemental oxygen is provided via an onboard system.

Most converted civilian aircraft have an empty weight of about 7,000 pounds. The Max Gross Weight of 11,485 (11,830 for –ZO) allows a full-fuel payload of more than 1,500 pounds – plenty for two pilots and their bags.

The performance is impressive: Mmo is 0.8 Mach with typical high-speed cruise speeds of 340 KTAS at FL180. The plane I fly does a bit better than that at 370 KTAS, probably due to its light weight. Fuel burn in the L-39 is also impressive, but like all turbine-powered aircraft, this rapidly decreases with altitude. On take-off, the engine rips through almost 400 gallons per hour (gph). High-speed cruise at FL180 draws about 180 gph. Closer to the service ceiling of 37,000 feet, TAS is 300 kts, and fuel burn drops to 120 gph.

Because it is a turbofan-powered aircraft, piloting the L-39 requires a type rating. For a pilot with jet experience, this can be accomplished with no more than a few hours of transition training. For those new to jets, plan on 10-15 hours depending on aptitude and prior experience. Pilots must have 1,000 hours TT with 500 hours PIC. Ground school is a must. The Albatros is certified in the Experimental/Exhibition category so renting one for training is disallowed by the FAA unless the aircraft provider has a Letter of Deviation Authority (LODA).

## Preflight

The preflight starts in front of the left wing. A look down the yawning air scoop allows inspection of the fan blades. On the left fuselage, an access panel is opened to check the nitrogen charge of the twin hydraulic accumulators. Higher up, another access panel opens to check the hydraulic fluid reservoir (for an accurate reading the system must first be depressurized). After a look up the tailpipe, engine oil is checked through a clear window on the right fuselage. Tires and brakes are checked, as are the wheel wells. A panel on the left nose cone provides access for two toggle switches that energize the fire detection/suppression system and the ejection seat circuits. Pencil-like barber poles stick up through the nose and the wing roots to provide visual confirmation the gear is down and locked. Fully extended flaps have their own barber pole indicators.

The VS-1 BRI ejection seats are a controversial option: maintaining them can be costly, and some pilots are uncomfortable sitting on top of three explosive charges and a rocket motor designed to propel a pilot upward with a 16G acceleration. Ejection seat training must be completed using an FAA-approved syllabus, and recurrent training is mandated every two years. Ejection from ground level is prohibited below 81 KTAS since at low speeds the canopy may not completely disconnect from the aircraft. There is an electronic lock-out mechanism that will prevent both pilots from simultaneously ejecting into each other. In the case of a frozen canopy, there is a through-the-canopy ejection option, and in the case of an uncontrolled landing where the canopies become jammed there is an explosive canopy deployment module. Simplicity

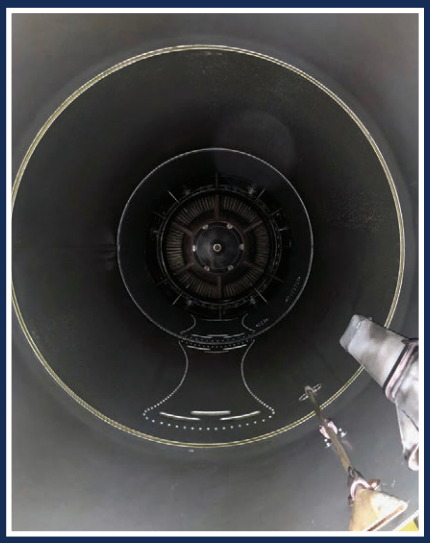
and economy are good arguments for having "cold" seats, but hot seats offer an extra added layer of safety; in the case of a low altitude emergency, there may not be time for a manual bail-out. Worldwide, there have been more than 7,560 documented fighter jet ejections with a pilot survival rate of 89 percent. One in three pilots sustained spinal compression injury.

Drop down steps and spring-loaded panels provide ladder-like entry to the front and rear cockpits. After removing the six safety pins, the ejection seats are "armed" and ready to go. Maneuvering into the seats requires careful placement of feet through loops of white lanyard. These lines will tighten during ejection, pulling the pilot's legs in for protection during egress. The integral seat belt/ejection harness is secured with a 4-point chest buckle. Twin ejection seat handles with integral triggers rise between the pilot's thighs.

The start sequence begins by engaging the parking brake, which will not grab until hydraulic pressure builds during engine rotation. Master and engine control switches on the right bulkhead panel are toggled, and a minimum of 24 volts is confirmed. An APU port on the port side can be used if needed. When the annunciator panel "Do Not Start" and "Canopy Not Secure" lights are extinguished, the Saphir Starter button on the left side panel is depressed. A "Ready" light illuminates on the annunciator panel when the Saphir engine is up to speed and stabilized. This is the signal to engage the "Start Engine" button and position the throttle up to the idle/start position. An immediate whine fills the cockpit as the N1 RPM begins to climb. At 26 RPM, the engine lights and settles to an idle speed of about 56 percent. Electrical systems are engaged, the cabin pressurization lever on the right side is advanced, bleed air is switched on, and cabin temperature controls are set.

Taxiing the L-39 takes a bit of practice. The nose wheel casters passively and directional control is provided by differential braking. The brake lever is on the stick and look and feels like a bicycle hand brake or motorcycle clutch lever. Pulling the handle routes hydraulic pressure to the brakes, with differential braking provided by rudder pedal position. The desired rudder pedal is fully depressed to initiate a turn. This keeps your legs moving during taxi, especially with a crosswind. Before takeoff, the flaps are tested for full deflection using push buttons on the left side panel and then set to Take Off position. Speed brakes are cycled by activating a switch on the throttle handle. Engine run-up is to full MIL power, taking note of bleed air surge valve closings at 76 percent and 84 percent power, and measuring the speed of acceleration and deceleration of the engine. The AI-25TL engine is known for its slow spooling time: it takes anywhere from 8-11 seconds to go from idle to max power. This takes some getting used to, especially for pilots transitioning from piston or turboprop aircraft who are used to more ready power on demand. The relatively low bypass ratio of the turbofan contributes to power lag. A few L-39s sport the Garret TFE-731 motor. This conversion offers simpler operation, better fuel efficiency, much faster spooling times (less than three seconds) and obviates the need for the Saphir unit.


▲ The L-39 typically achieves a high-speed cruise between 340 and 370 KTAS at FL180.



▲ A look inside the L-39 tailpipe.

Take-off begins by advancing the throttle to the forward stop. Maximum N1 RPM should stabilize at just under 107 RPM. After checking temperatures and pressures, the brakes are released. Acceleration is brisk on the runway, and the 100-knot rotation speed comes up quickly with a ground roll of less than 1,500 feet. Positive rate, gear up, retract flaps at 140, and the plane settles in for a $V_Y$ climb at 216 knots. Initial VSI at full MIL power is in excess of 4,000 fpm. Reduce power for normal climb to 101 percent and the VSI drops to 2,800 fpm. Sound levels are surprisingly low. A large turbocooler provides excellent cabin comfort even on hot summer days in Florida.

## Handling

Once airborne, the plane handles like a giant Bonanza. Controls are balanced and harmonious. A high-hat trim switch on top of the stick can be used to relieve pitch and roll stick forces. Speed builds quickly, especially in a dive, and the lack of a propeller coupled with the sleek planform means the plane doesn't like to slow down. Approach Vmo (0.8 Mach) and the speed brakes will deploy automatically.

Stalls are a non-item as the wing telegraphs critical angle of attack with a consistent shudder. Steep turns are easy once a proper sight picture is appreciated. Rudder input is minimal. Rolling maneuvers (barrel, aileron, hesitation) are smooth and gentle (remember the 20-second inverted time limit). Loops require almost 5,000 vertical feet. If done well enough to maintain at least 75 kts. at the top, the pilot will experience a sustained 4G pull. Under load, the staccato vibration of the G-suite pressurization system is heard and felt. Upright spins are limited to two turns, and tail slides are done with almost no risk of compressor stall. Pitch forces are light throughout the envelope, and the airplane responds to elevator input with great sensitivity. Roll response is a little slower, impeded by the mass of the tip tanks. Modifications are available to remove the tip tanks for increased speed and higher roll rates.

Since fuel and pressurization systems are automated, the pilot is free to just fly the plane. It's a great cross-country machine with the caveat that endurance with reserves is under two hours. I flight plan for 500-mile legs when traveling cross-country. Much more than 90 minutes in the ejection seat becomes uncomfortable as seat cushions are not allowed. Specialty ejection seat pads can be found, but they are costly and don't offer much relief.

## Landing

Landing is commenced at a 1,500-2,000 ft AGL initial approach during which time speed should be bled down to about 200 kts. The downwind leg is flown just below the $V_{le}$ speed of 180 kts. Gear down past the numbers, flaps approach on base, flaps landing on final (140-120 kts) and cross the fence at 100 kts. A Flettner tab on the left side of the elevator automatically extends with flap deployment to mitigate flap-induced pitching moments. Throughout the approach, engine RPM must be kept no lower than 80 percent in case of a balked landing. Spool-up time is long enough that a go-around may actually turn into a touch and go. Speed brakes are deployed as needed.

Touchdown is softened by robust trailing link gear. For short field work, the nose can be kept high for aerodynamic braking. Antilock brakes can be applied once the nose is planted to depress the nose-gear-mounted weight-on-wheels switch.

Maintenance is made easier by large access panels and the simplicity of the systems. Dispatch reliability is excellent, and the plane offers few surprises.

With its good looks and warbird cachet, the L-39 turns heads on every ramp. Service and parts support for the airframe and engine are readily available domestically. There are several L-39s listed for sale, with prices ranging from $120,000 to $590,000 depending on aircraft age, engine time, avionics and modifications. There are a few specialty shops that are worth consulting if you are in the market. John Morgan at Pride Aircraft in Rockford, Illinois has been in restoration and sales since the first L-39s were imported to the U.S. He has an encyclopedic knowledge of the L-39 and his shop offers service, parts, and all popular airframe mods. North America's only Ivchenko engine specialist is in Toledo, Ohio, at the eponymously-named AI-25TL company. Richard Hess and his team can rehab and repair the Ivchenko powerplant and are working on FAA overhaul approval. Nathan Jones, of Code 1 Aviation, has a robust brokerage and has been instrumental in developing the Garrett modification.

The L-39 Albatros offers speed, aerobatic capability and the thrill of flying a real fighter jet. It is arguably the ultimate PLJ. T&T

**Dr. Dan Greenwald** *began flying in 1975 and has been an active flight instructor continuously since 1979. He has over 10,000 hours total time. Dan is an active Unlimited Aerobatic Flight Instructor and a former FAA Designated Pilot Examiner. He provides flight instruction through his company, Angle of Attack Experience, in L-39 and Extra 330 aircraft. You can reach Doctor Dan at 813-334-7974 or via* **www.AngleOfAttackExperience.com**.

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# Cheap at Any Price

by **Kevin Ware**

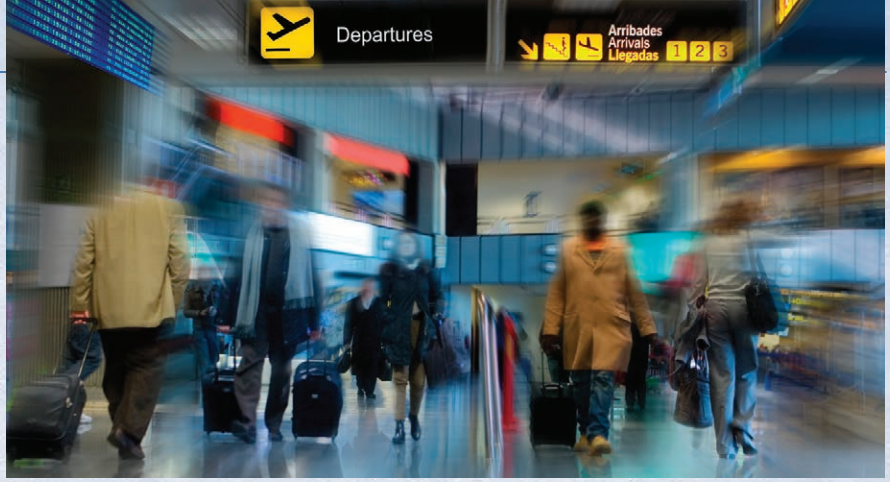
Our twin and turbine aircraft are expensive to operate, and I occasionally wonder if the extra cost is worth it. But recently, I had to return from a trip to Phoenix via the airlines that very quickly corrected any doubt I had about the value of the business aircraft we operate – and often take for granted. It is a story that needs to be told more frequently.

It is a 2-hour and 15-minute trip from Seattle to Phoenix in the Lear 40, and we are scheduled to fly a customer and his family down there to watch the professional baseball players winter practice. The customer and his five family members arrive at about 6 p.m. at our home base airport (KBVS – about 50 miles north of Seattle) after a short traffic-free drive from their home. It is already dark, but the Lear is out on the ramp, brightly lit by the building's floodlights and with a red carpet already in place by the entry door. The airplane is connected to external power; the cabin is nicely warm and smells of the coffee, which has just been freshly brewed in the small galley. A couple of bottles of expensive wine and high-quality champagne are cooling in the ice chest just under the cabinet containing crystal glasses. The customer pulls his car right up to the airplane's baggage door after passing through the controlled gate, and the ramp guys load up their stuff. The car then gets parked about 150 feet away where it will stay at no charge until they return. All six passengers board at their leisure then sit in their choice of wide, reclining leather seats, loosen their shoelaces and comfortably stretch out their legs. I close the airplane door then conduct a short safety brief, making sure to point out the bathroom.

Seven minutes later and we are airborne, receiving our IFR clearance in the air, having made an expedited VFR departure from the non-towered airport. Twenty slightly bumpy minutes go by, and we cross the Columbia River southbound, topping out at FL410 where the moon is out and the air as smooth as glass. The seatbelt sign is turned off, and we can hear the wine and champagne bottles being opened and the slight tinkle of crystal as the passengers help themselves and settle in with their drink and selection of gourmet cheeses bought from a local supplier. Occasionally, they poke their heads into the cockpit to say hello and stare at the jet's instrument display, the lighting of which we have turned down. With cloud tops in the mid-30s, the view forward at FL410 goes on forever and it is a beautiful night. Underneath us somewhere, we can hear airline traffic just below the tops and looking for a better ride.

An hour later, we are over Cedar City, Utah making a small dogleg from our filed direct routing in order to avoid the military airspace out to the west. Shortly after that, Salt Lake Center starts us down and clears us direct to the TENTS intersection, telling us to expect the BRUSR 1 arrival. The next controller clears us to descend via the published arrival but to keep the speed up to 300 knots or greater for traffic sequencing. Not a problem for us as we are seeing 360 knots with the FMS predicting we will be arriving 10 minutes earlier than planned. I turn around in my seat and tell our passengers we will be landing in 20 minutes. They look both surprised and disappointed as from their point of view, the flight has been way too short. Besides, there is still some champagne in the bottle, cheese on the plate and they are having a pleasant conversation.

On our first call, Phoenix approach assigns us the ILS to 26 but we tell them we are going to Cutter Aviation on the airport's southwest corner and request 25L. Not a problem they say, and change our vector slightly while I reprogram the FMS. We are 5 miles out on final and ask the controller if they have any traffic behind us. He says no, all the airline traffic is going into 26. We tell him we plan to land long and exit at the end to avoid a long taxi. "Approved" is his brief reply. Our landing goes smoothly and is not followed by any harsh braking or full reverse thrust as we let the Lear run out nearly to the end of 25L, making the H3 exit which is immediately adjacent to Cutter. We are still rolling through the exit when the tower clears us to the FBO and tells us to stay on his frequency. One-hundred




yards ahead, we can already see Cutter's "follow me" car and two minutes later, pull up to their ramp where our customers' rental car is already parked close to the Lear's passenger door, with the engine running, heater on and trunk door open. Five minutes later and their baggage has been loaded in the car, and they thank us profusely for such a nice flight. We put the covers on the engines and arrive at our hotel just 10 minutes later.

The next morning, I am to return via airline as the Lear will be staying in Phoenix for a couple of days and I am needed back home. And that is where the "fun" begins.

Dispatch has me scheduled to return on an airline 737 flight that leaves PHX at 10:50 and arrives in SEA nearly three hours later. I ask the hotel clerk what time I should board their shuttle to the airport in the morning. He proceeds to make some comments about freeway traffic and TSA lines then says I should be on the shuttle no later than 0800. I cannot help but think the time it will take me just to get through the airport will be longer than our entire flight down from Seattle in the Lear.

I get up at 0600, eat the free hotel breakfast and board the shuttle as instructed at 0800. The TSA line was actually not too bad as it took only 25 minutes to get through, but then, of course, there was the business of putting my shoes and belt back on while repacking my case with items removed for closer inspection. Finally, I am 'in' and wind up walking about a half-mile to the assigned gate. Once there, I note there has been some seat assignment snafu, and I ask the gate agent if she can move me to a better seat, or perhaps upgrade me to first class. Not a chance she replies – the flight is overbooked already. So, I look around to find an empty place to sit and wait, only to find the upholstery on near every seat is torn or cracked with the dirty foam pad cushion showing through. Even in the days of my youth taking trips via Greyhound bus (and appropriately called "riding the dog") do I have memories of public travel facilities being so poorly maintained.

Finally, boarding time arrives with a line of more than 180 people jostling for position, as if boarding first will somehow result in arriving earlier. I make my way to the assigned middle seat way in the back, only to find it is between two large, well-fed individuals who are very reluctant to get up and let me in. With some difficulty, I squeeze pass protruding knees into my allowed 17 inches of narrow seat space and put my small bag under the seat in front of me with the overhead being full. The passenger to the right says nothing but promptly pulls the window shade down to better see his computer. The one by the aisle on my left immediately returns to a loud personal phone call that my arrival interrupted. Both seem to regard the armrests separating us as their personal real estate with absolutely no trespassing allowed. I keep my elbows tight to the chest and try not to breathe too deeply.

As the 737 loads, the cabin gets warmer and warmer, with the smell of hot humanity becoming much more pervasive – sort of like a gym locker room. Finally, after every single seat is occupied, and all the luggage overheads brim with stuff that really should have gone in the hold below, the airplane is pushed back and taxis out. I can see through one of the few windows that is open that there is a line of Boeing and Airbus products at least nine airplanes long waiting in the line for takeoff. Eventually, we work our way up to the front of the line, and now clearly late for the departure, get airborne. The airplane climbs into the mid-30s, and for the next hour the seat belt sign stays on due to a continuous light chop. The cabin attendants stay put, strapped into their seats. Finally, when we get up near the Oregon border somewhere, they hurry by pushing heavy carts, smiling as best as they can and offering free pop and water, but beer and wine are at high-end downtown Seattle restaurant prices.

Soon, I hear the power come back, and we start a descent into the Seattle area. Unfortunately, SEA appears to be running their traffic to the south, so the 737 winds up well to the north of Paine Field (PAE), before finally turning around and connecting with the ILS into Runway 16. The landing leaves no doubt the airplane is on the ground, and with hard braking and a lot of noisy reverse thrust, the airplane hurriedly makes one of the mid-runway exits and proceeds to the ramp. But then, as we approach our gate, it appears it is not yet ready, so we sit there for another 10 minutes while ramp guys in small trucks hustle about clearing the space. When the airplane pulls up to the stop line and the seat belt sign is turned off, all 181 people onboard seem to stand up at once, as if doing so will somehow expedite disembarkation and get them home earlier. This, of course, does not help at all and another 20 minutes go by while people anxiously chase down their

carry-ons placed in faraway bins because all others were full.

The return from my 2-hour Lear trip to PHX the night before has thus far used up 7 hours and I am still not done.

My next flight is the commuter trip from SEA to Bellingham (BLI), which is not scheduled to leave for another 2.5 hours. I wait around sitting on crowded and uncomfortable hard molded plastic seats, and try to read a paperback brought with me for this purpose. My reading, however, is interrupted by continued gate change announcements from the public address system, interspersed with loud recorded announcements from members of the Port of Seattle Commission pointing out the need to promptly report any unclaimed bags that might be left about – could be a bomb you know – and by the way, welcome to Seattle.

The turboprop flight from SEA to BLI takes only 35 minutes, but for some mysterious reason, they start boarding this relatively small airplane 45 minutes before the scheduled departure. Push back from the gate is on time, but then we are stuck in another long line of departing airline traffic. We finally get airborne and climb into a cloud layer where we stay bumping along for about half an hour. Our arrival at BLI is around 30 minutes late, but the gate is open and the disembarking process at this small airport fairly quick. I place an Uber call on my phone and 10 minutes later am headed on the half-hour trip back to BVS, which is where I departed from last night.

As I sit there making occasional small talk to the Uber driver who is from India, it occurs to me the trip down to PHX in the Lear was a relaxed 2 hours, with just minutes of pre-boarding and post boarding folderol. The airline trip back from PHX however, has thus far taken nearly 12 hours with a good eight of those hours standing in lines, or just sitting around in crowded and uncomfortable surroundings. Even the 3.5-hour portion of the return trip that was actually airborne was not at all for someone opposed to close personal contact with complete strangers, or in possession of a bottom much wider than 17 inches.

Domestic airline travel has seemingly become a public commodity, with any suggestion that it should be convenient, comfortable or timely long forgotten. Sorry to say, but even "riding the dog" during my teenage years was a better experience than airline travel is today. Our twin and turbine airplanes may be expensive to operate, but given the alternative, they are "cheap at any price." T&T

**Kevin Ware** *is an ATP who also holds CFI, MEII and helicopter ratings, has more than 10,000 hours and is typed in several different business jets. He has been flying for a living on and off since he was 20, and currently works as a contract pilot for various corporations in the Seattle area. When not working as a pilot he is employed part time as an emergency and urgent care physician. He can be reached at* **kevin.ware2@aol.com**.

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| 238 | BEECHJET 400A |
| 124 | BOEING BBJ |
| 371 | CHALLENGER 300 |
| 55 | CHALLENGER 600 |
| 38 | CHALLENGER 601-1A |
| 109 | CHALLENGER 601-3A |
| 51 | CHALLENGER 601-3R |
| 289 | CHALLENGER 604 |
| 9 | CHALLENGER 800 |
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| 285 | CITATION 525 |
| 266 | CITATION BRAVO |
| 153 | CITATION CJ1 |
| 85 | CITATION CJ1+ |
| 194 | CITATION CJ2 |
| 163 | CITATION CJ2+ |
| 357 | CITATION CJ3 |
| 92 | CITATION CJ3+ |
| 240 | CITATION CJ4 |
| 152 | CITATION ENCORE |
| 50 | CITATION ENCORE+ |
| 297 | CITATION EXCEL |
| 18 | CITATION I |
| 242 | CITATION I/SP |
| 451 | CITATION II |
| 58 | CITATION II/SP |
| 161 | CITATION III |
| 64 | CITATION LATITUDE |
| 171 | CITATION M2 |
| 381 | CITATION MUSTANG |
| 125 | CITATION S/II |
| 256 | CITATION SOVEREIGN |
| 68 | CITATION SOVEREIGN+ |
| 241 | CITATION ULTRA |
| 236 | CITATION V |
| 28 | CITATION VI |
| 97 | CITATION VII |
| 255 | CITATION X |
| 25 | CITATION X+ |
| 212 | CITATION XLS |
| 209 | CITATION XLS+ |
| 1 | DIAMOND I |
| 42 | DIAMOND IA |
| 3 | DORNIER ENVOY 3 |
| 232 | ECLIPSE EA500 |
| 52 | EMBRAER LEGACY 500 |
| 135 | EMBRAER LEGACY 600 |
| 58 | EMBRAER LEGACY 650 |
| 232 | EMBRAER PHENOM 100 |
| 261 | EMBRAER PHENOM 300 |
| 75 | FALCON 10 |
| 21 | FALCON 100 |
| 19 | FALCON 200 |
| 186 | FALCON 2000 |
| 21 | FALCON 2000EX |
| 58 | FALCON 20C |
| 15 | FALCON 20C-5 |
| 23 | FALCON 20D |
| 2 | FALCON 20D-5 |
| 31 | FALCON 20E |
| 9 | FALCON 20E-5 |
| 68 | FALCON 20F |
| 64 | FALCON 20F-5 |
| 194 | FALCON 50 |
| 8 | FALCON 50-40 |
| 91 | FALCON 50EX |
| 153 | FALCON 900 |
| 23 | FALCON 900C |
| 102 | FALCON 900EX |
| 180 | GLOBAL 5000 |
| 127 | GLOBAL EXPRESS |
| 19 | GULFSTREAM G-100 |
| 206 | GULFSTREAM G-200 |
| 8 | GULFSTREAM G-300 |
| 22 | GULFSTREAM G-400 |
| 283 | GULFSTREAM G-450 |
| 7 | GULFSTREAM G-500 |
| 471 | GULFSTREAM G-550 |
| 62 | GULFSTREAM G-II |
| 22 | GULFSTREAM G-IIB |
| 128 | GULFSTREAM G-III |
| 170 | GULFSTREAM G-IV |
| 283 | GULFSTREAM G-IVSP |
| 170 | GULFSTREAM G-V |
| 34 | HAWKER 1000A |
| 5 | HAWKER 125-1A |
| 7 | HAWKER 125-1AS |
| 4 | HAWKER 125-3A/RA |
| 11 | HAWKER 125-400A |
| 13 | HAWKER 125-400AS |
| 12 | HAWKER 125-400B |
| 11 | HAWKER 125-600A |
| 3 | HAWKER 125-600AS |
| 103 | HAWKER 125-700A |
| 59 | HAWKER 4000 |
| 187 | HAWKER 400XP |
| 34 | HAWKER 750 |
| 180 | HAWKER 800A |
| 33 | HAWKER 800B |
| 353 | HAWKER 800XP |
| 40 | HAWKER 800XPI |
| 81 | HAWKER 850XP |
| 155 | HAWKER 900XP |
| 6 | JET COMMANDER 1121 |
| 4 | JET COMMANDER 1121B |
| 1 | JETSTAR 6 |
| 5 | JETSTAR 731 |
| 12 | JETSTAR II |
| 8 | LEARJET 23 |
| 17 | LEARJET 24 |
| 1 | LEARJET 24A |
| 11 | LEARJET 24B |
| 34 | LEARJET 24D |
| 10 | LEARJET 24E |
| 7 | LEARJET 24F |
| 11 | LEARJET 25 |
| 36 | LEARJET 25B |
| 9 | LEARJET 25C |
| 92 | LEARJET 25D |
| 3 | LEARJET 28 |
| 28 | LEARJET 31 |
| 167 | LEARJET 31A |
| 33 | LEARJET 35 |
| 352 | LEARJET 35A |
| 13 | LEARJET 36 |
| 32 | LEARJET 36A |
| 30 | LEARJET 40 |
| 192 | LEARJET 45 |
| 166 | LEARJET 45XR |
| 100 | LEARJET 55 |
| 4 | LEARJET 55B |
| 12 | LEARJET 55C |
| 256 | LEARJET 60 |
| 467 | PILATUS PC-12/45 |
| 110 | PREMIER I |
| 6 | SABRELINER 40 |
| 17 | SABRELINER 40A |
| 3 | SABRELINER 40EL |
| 1 | SABRELINER 40R |
| 21 | SABRELINER 60 |
| 18 | SABRELINER 60ELXM |
| 2 | SABRELINER 60EX |
| 62 | SABRELINER 65 |
| 13 | SABRELINER 80 |
| 6 | SABRELINER 80SC |
| 71 | WESTWIND 1 |
| 5 | WESTWIND 1123 |
| 29 | WESTWIND 1124 |
| 62 | WESTWIND 2 |

## Turboprops – 11,093

### Chief Pilots & Owners

| Count | Aircraft |
|---|---|
| 2 | PIPER MALIBU |
| 362 | CARAVAN 208 |
| 1206 | CARAVAN 208B |
| 2 | CARAVAN II |
| 33 | CHEYENNE 400 |
| 137 | CHEYENNE I |
| 13 | CHEYENNE IA |
| 262 | CHEYENNE II |
| 57 | CHEYENNE III |
| 38 | CHEYENNE IIIA |
| 51 | CHEYENNE IIXL |
| 22 | CHEYENNE IV |

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| | |
|---|---|
| 179 | CONQUEST I |
| 249 | CONQUEST II |
| 45 | JETSTREAM 31 |
| 60 | JETSTREAM 32 |
| 61 | JETSTREAM 41 |
| 30 | KING AIR 100 |
| 514 | KING AIR 200 |
| 20 | KING AIR 200C |
| 17 | KING AIR 200T |
| 153 | KING AIR 250 |
| 177 | KING AIR 300 |
| 11 | KING AIR 300LW |
| 558 | KING AIR 350 |
| 61 | KING AIR 350C |
| 314 | KING AIR 350I |
| 19 | KING AIR 90 |
| 11 | KING AIR A/B90 |
| 58 | KING AIR A100 |
| 210 | KING AIR A200 |
| 54 | KING AIR A90 |
| 106 | KING AIR A90-1 |
| 93 | KING AIR B100 |
| 886 | KING AIR B200 |
| 100 | KING AIR B200C |
| 8 | KING AIR B200CT |
| 95 | KING AIR B200GT |
| 4 | KING AIR B200SE |
| 21 | KING AIR B200T |
| 79 | KING AIR B90 |
| 332 | KING AIR C90 |
| 34 | KING AIR C90-1 |
| 188 | KING AIR C90A |
| 369 | KING AIR C90B |
| 78 | KING AIR C90GT |
| 93 | KING AIR C90GTI |
| 119 | KING AIR C90GTX |
| 13 | KING AIR C90SE |
| 242 | KING AIR E90 |
| 155 | KING AIR F90 |
| 25 | KING AIR F90-1 |
| 8 | MERLIN 300 |
| 25 | MERLIN IIB |
| 19 | MERLIN III |
| 26 | MERLIN IIIA |
| 47 | MERLIN IIIB |
| 19 | MERLIN IIIC |
| 4 | MERLIN IV |
| 9 | MERLIN IV-A |
| 8 | MERLIN IV-C |
| 63 | MITSUBISHI MARQUISE |
| 1 | MITSUBISHI MU-2D |
| 23 | MITSUBISHI MU-2F |
| 18 | MITSUBISHI MU-2J |
| 33 | MITSUBISHI MU-2K |
| 11 | MITSUBISHI MU-2L |
| 18 | MITSUBISHI MU-2M |
| 17 | MITSUBISHI MU-2N |
| 24 | MITSUBISHI MU-2P |
| 36 | MITSUBISHI SOLITAIRE |
| 567 | PILATUS PC-12 NG |
| 149 | PILATUS PC-12/47 |
| 228 | PIPER JETPROP |
| 46 | PIPER M500 |
| 59 | PIPER M600 |
| 481 | PIPER MERIDIAN |
| 3 | ROCKWELL 680T TURBO |
| 5 | ROCKWELL 680V TURBO II |
| 5 | ROCKWELL 680W TURBO II |
| 4 | ROCKWELL 681 HAWK |
| 98 | SOCATA TBM-700A |
| 68 | SOCATA TBM-700B |
| 292 | SOCATA TBM-850 |
| 102 | SOCATA TBM-900 |
| 5 | STARSHIP 2000A |
| 70 | TURBO COMMANDER 1000 |
| 38 | TURBO COMMANDER 690 |
| 140 | TURBO COMMANDER 690A |
| 139 | TURBO COMMANDER 690B |
| 79 | TURBO COMMANDER 840 |
| 24 | TURBO COMMANDER 900 |
| 56 | TURBO COMMANDER 980 |

### Twin Piston – 6,507

**Owners**

| Count | Aircraft |
|---|---|
| 37 | BARON 56 TC |
| 1433 | BARON 58 |
| 2 | BARON 58 PA |
| 345 | BARON 58P |
| 108 | BARON 58TC |
| 3 | BARON A56TC |
| 321 | BARON G58 |
| 188 | BEECH DUKE B60 |
| 162 | CESSNA 340 |
| 520 | CESSNA 340A |
| 70 | CESSNA 402B BUSINESS LINER |
| 133 | CESSNA 402C |
| 24 | CESSNA 404 TITAN |
| 247 | CESSNA 414 |
| 357 | CESSNA 414A CHANCELLOR |
| 43 | CESSNA 421 |
| 38 | CESSNA 421A |
| 335 | CESSNA 421B |
| 607 | CESSNA 421C |
| 53 | CESSNA T303 |
| 106 | PIPER 601P AEROSTAR |
| 24 | PIPER 602P AEROSTAR |
| 442 | PIPER CHIEFTAIN |
| 314 | PIPER MERIDIAN |
| 25 | PIPER MOJAVE |
| 315 | PIPER NAVAJO |
| 13 | ROCKWELL 500 SHRIKE |
| 24 | ROCKWELL 500A SHRIKE |
| 77 | ROCKWELL 500B SHRIKE |
| 44 | ROCKWELL 500S SHRIKE |
| 5 | ROCKWELL 500U SHRIKE |
| 12 | ROCKWELL 520 COMMANDER |
| 5 | ROCKWELL 560 COMMANDER |
| 11 | ROCKWELL 560A COMMANDER |
| 7 | ROCKWELL 560E COMMANDER |
| 7 | ROCKWELL 560F COMMANDER |
| 13 | ROCKWELL 680 SUPER |
| 3 | ROCKWELL 680E |
| 14 | ROCKWELL 680F COMMANDER |
| 14 | ROCKWELL 680FL GRAND COMMANDER |
| 6 | ROCKWELL 680FLP GRAND LINER |

### High Performance Move-Up Singles – 5,668

**Owners**

| Count | Aircraft |
|---|---|
| 225 | BEECH BONANZA |
| 429 | CESSNA 182 |
| 54 | CESSNA 206 |
| 393 | CESSNA P210N |
| 21 | CESSNA P210R |
| 52 | CESSNA T182 |
| 1 | CESSNA T206 |
| 782 | CIRRUS SR20 |
| 2920 | CIRRUS SR22 |
| 238 | PIPER MALIBU |
| 104 | PIPER MATRIX |
| 449 | PIPER MIRAGE |

### 38,755 TOTAL AIRCRAFT

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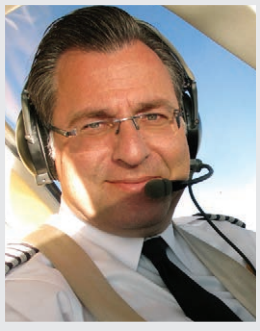
PHOTOS COURTESY OF GUIDO WARNECKE

# FIVE on the FLY

by **Rebecca Groom Jacobs**



**WHO:**
## Guido Warnecke

**POSITION:**
**Worldwide Ferry Pilot, Owner of GW Aerologistics LLC**

**HOME BASE:**
**Danbury, CT (KDXR)**

**RATINGS:**
**ATPL (SACAA and FAA) with types in BE30, CE-525, CE-500, G159, GLF2**

**FLIGHT HOURS:**
**10,000+**

### *1. Can you describe your introduction to general aviation?*

I was born and raised in Germany and was always fascinated by flying, mainly because my father was a passionate private pilot. However, back in the 1980s, it was not possible for me to pursue a professional pilot career in Germany, so I got a master's degree in mining engineering and started working in a totally different field. I finally got my private pilot license in Canada in the 1990s, and while working as an engineer in South Africa, I had the opportunity to fly to remote mining operations in a Cessna 210. After more than 1,500 hours flown as a private pilot, I was finally determined to turn my passion into my new career!

Once I passed my ATPL, I quit my engineering job and founded my own aircraft operations business in South Africa. I flew mainly for the mining industry in smaller aircraft like Beechcraft Baron, C421 and King Air 90. Later, I added type ratings for the Gulfstream G-159 and the Gulfstream II. In 2008, I moved with my wife to the United States. I started to work as a Part 135 Charter Pilot in the Northeast and added the FAA ATPL and some type ratings to my licenses. After a few years, I was given a great opportunity to take an assignment in the Middle East, flying a private VVIP jet owner and his family across the globe. All these global flying experiences built the foundation for becoming a ferry pilot. By now, I have completed more than 100 ferry flights across the globe.

### *2. What is your role today? Typical mission?*

In addition to working as a worldwide ferry pilot for turbine and light jet aircraft, I provide contract pilot services for U.S. aircraft owners on King Airs and C525 series jets. I offer insurance approved mentoring and training programs for King Air owners, especially the Garrett engine-equipped B100. Training on new avionics systems, e.g. ProLine Fusion and Garmin G3000 is available. Furthermore, I provide aviation consulting services to support aircraft sales projects and am a passionate aircraft photographer. (You can check out my photo section on Flightaware.com for more than 35,000 aircraft pictures).

### *3. Can you discuss some of the challenges of ferrying aircraft all over the world?*

Every ferry flight is its own project! There is never a routine as each flight has to be planned and prepared in great detail. And still, even with the best planning, there

will be unexpected events such as weather, technical issues, logistical aspects, etc. Keep in mind that larger aircraft cannot be packed in a container, so ferry flying is the only way of transportation between seller and buyer. For both parties, this is a very sensitive part of the deal, and the ferry pilot carries the full responsibility for the multi-million-dollar asset.

Not to mention, the aircraft I ferry are not designed to cross the globe. To share some flavor of the challenges, imagine flying a Cessna Caravan single pilot 14 hours nonstop from California to Hawaii (taking off with FAA-approved 30 percent over gross weight), crossing the North Atlantic during winter in a King Air, or landing a Citation Jet at a Russian peninsula at minus 40 degrees in a snowstorm with limited visibility.

### 4. *What trends do you see occurring in worldwide aircraft sales?*

On top of being strong in the domestic market, U.S. general aviation aircraft are of high demand in the global market. I am mainly involved in the delivery of Textron Aviation products like the King Airs, Caravan and Citations. High sales numbers are being seen in Asia along with the expansion of the Chinese market. Other growing markets include tourist sections (like resorts in Africa), utility aircraft for remote areas, or modified aircraft for research organizations.

### 5. *Can you describe one of your most memorable trips/deliveries?*

There are many remarkable moments as each trip is unique. The first ferry flight in a light aircraft remains a very special one for me – a North Atlantic crossing in a Mooney. Ferry flights to South Africa are also special for me as I can leverage my local knowledge and network. And of course, coming back stateside and being greeted by the New York ATC controllers is always a highlight. I experience each delivery as something very special. It is highly awarding to see how happy the new owners are in taking over their aircraft. On some of the ferry flights, I accompany local crews on the way to their new destinations and have made friends with pilots from Japan, South Korea, China and Australia. T&T

PHOTO COURTESY OF BEST TUGS

# Best Tugs: Advanced Towing

by **Rich Pickett**

We are fortunate in aviation to have a number of innovative companies to support our industry. One company in particular caught my eye a couple of years ago as I searched for a replacement tug for my aircraft. I scoured numerous options but upon approaching Best Tugs at EAA AirVenture in 2017, I selected their electric Best Tugs Bravo 5. After seeing the whole product line, I felt they broke the mold on a product we owner-pilots all utilize.

Best Tugs, based in Spanish Forks, Utah, was launched in 2015 by brothers Mark and Mike Petey, both engineers. The pair had recently sold their electric hybrid transportation design and manufacturing business, Prodigy Engineering – a company known for high quality, and very unique, electric vehicle propulsion systems. Mark and Mike have always had a passion for aviation, having built 13 airplanes as well as owned and piloted a variety of aircraft including light jets and helicopters.

The brothers became interested in building tugs when they realized they were moving high-value aircraft with relatively basic equipment. Mark's wife Suzy, also a pilot, found it a hassle to move her SR22 using a basic tug into a tight hangar. Being pragmatic, Mark knew there had to be a way to develop a more advanced tug.

They built their first version, the B5 which is capable of towing 5,600 pounds, in a shop by their house. The official launch of their tug was in April 2016 at Sun 'n Fun in Lakeland, Florida. Mike and Mark originally estimated they would build and sell 3 to 5 per month. Today however, they produce 3 to 5 per *day*, and have expanded to their third manufacturing facility within two years.

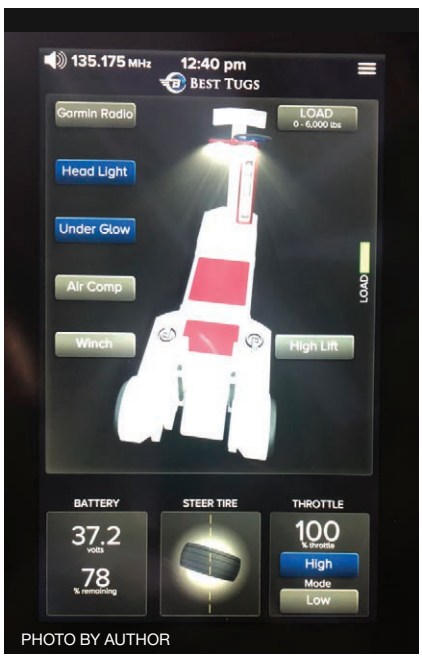



PHOTO BY AUTHOR

The Echo series sports an all-weather touch panel to control the tug's numerous features.

## A Tug for Almost Any Aircraft

Best Tugs now offers five major product lines: Alpha, Bravo, Echo, Romeo, and the latest, Sierra which is under development. Within each product line, there are models with varying load capacities and capabilities, along with a variety of options including cup holders, helicopter lifts, air compressors and even fire extinguishers.

The Alpha A2 and A3, starting at $2,995, are dragger style tugs, useful to move lighter aircraft with a maximum weight of 3,600 pounds, with options for tailwheel airplanes. I selected one of these for a friend's Husky which has worked well. I also considered this option for my Cirrus SR22, however I needed flexibility to move a variety of aircraft (and possibly a helicopter in the future), so the Bravo B5 offered more flexibility to fit my needs.

The Bravo series, starting at $5,800, consists of larger, walk-behind tugs that can move larger piston and turboprop singles as well as twins and jets up to 18,000 pounds. Using a combination of loading straps, ramps and a "Quick Lock" fork for planes with fairings such as the SR22, the Bravo B5 is extremely easy to use with very smooth throttle response. With the two-speed throttle, I use the low speed for fine movement into my hangar and the higher speed when I need to move it farther distances. You can easily switch between the fork and strap depending upon the aircraft you need to move.

PHOTO COURTESY OF BEST TUGS

To counter potential prop damage, Best Tugs has patented their Prop-Safe Technology.

I've even used the cup holder and USB charging ports on the handle. I also purchased the onboard air compressor option which makes it easy to position the tires and then inflate them. If you need to travel over raised metal tracks at your hangar, I recommend the optional shock absorber on the steering tire which makes it smoother when moving over those rails.

For those owners with helicopters, Best Tugs has two options: a helicopter lift attachment that will work on a Bravo B5, or a Bravo-derived helicopter product line named the Heli. Currently, their helicopter lift is designed for a Robinson, which makes sense because they also fly one themselves. It locks onto the helicopter and has a remote lift to raise the nose enough to roll the aircraft on its rear wheels or a dolly. They offer two versions of their Heli line – H5 and H9, which reflects the weight capabilities. If you want to move helicopters that utilize a platform, they also offer a towing adapter for the Bravo, and other lines, that allows you to tow the landing pad.

The Romeo, which also starts at $5,800, is their low-profile remote-control line, complete with remote

operation of the loading platform. For those owners who need a "Lazy Susan" ramp for either limited nose gear turning limits, or narrow hangar approaches, you can order that option with the Romeo. I've used their remote control and it is very intuitive with advanced features not available on other remote tugs.

Recently, Best Tugs released their new ride-on line of tugs, the Echo, starting with the E12, E15, E18, E21 and E24 which I evaluated at NBAA in October. The Echo is the most advanced ride-on tug I've ever seen. Designed primarily for FBOs (or owners that simply want to have the latest technology), the Echo series sports a touch panel to control the features of the tug. Using the all-weather touch panel, operators can select power based upon what weight they will be moving, operate the optional winch or lift, even tune the included 10 watt Garmin communications radio to call base or the airport Ground Control.

The power adjustment for various aircraft helps reduce any potential damage, especially to lighter aircraft and can even sense if the pilot has left the brakes on. They even included a visual monitor for the steerable wheel position which should prevent many tug incidents. As we know, software requires updates and you can download the latest software with the included adaptor from your smartphone to update your Echo to the latest release. Another example of the user-focused design of their tugs.

Best Tug products also offer unique features such an auto-throttle, braking and even optional regenerative braking on some models. The auto-throttle will actually sense if an airplane being moving is on a slope and will prevent runaway movement – while at the same time braking to charge the batteries. Their system monitors sensors 100 times per second, and can make adjustments at the rate of 30 per second.

A common damage to planes during towing occurs when the prop hits the tug and is bent. As more aircraft have four and five bladed propellers,

moving them with tugs can be a challenge. To counter this potential issue, Best Tugs has patented their Prop-Safe Technology which is incorporated in their tugs as a low-profile platform that allows operators to safely move even 5-bladed aircraft.

Who is to say what the Petey brothers and the rest of their capable team will develop next. But, based upon their current products and expertise, I can assume it will be something useful for the aviation community. T&T

*After 11,000 hours of piloting over 90 aircraft models,* **Rich Pickett** *still has a passion for flying. Rich holds an ATP, CFII SME, SES, glider licenses, and type ratings in the L29, L39, Citation 500/510s/525s, Eclipse 500S and DA10. His company, Personal Wings, provides training, mentoring and aircraft services. You can contact Rich at* **rich@personalwings.com**.

by **Kevin R. Dingman**

# Gettin' Hitched

## *Saying 'I Do' to DIY aircraft towing.*

**Left Brain = logic, language, math. Right Brain = art, music, intuition, love. How to engage both when towing an airplane.**

What makes an airplane fly? Airspeed and money, right? Regulations, physicals, training, financing, maintenance, insurance, fuel, cleaning and towing can merely be a means to our end – that of achieving flight. But the airspeed and money cliché along with our clinical persona may deprive us of something more. What if we allow the right side of our brain to have a seat in the towing vehicle before we slide into the left seat of the airplane? For those that fall into the "someone else does that for me" category, consider this my Valentine proposal to say 'I do' to do-it-yourself towing.

### How Do I Tow Thee

*How do I tow thee, let me count the ways:*

*I tow thee to the depth and breadth my tug may reach,*
*after halting for the night; at the end of soaring,*
*after an inspiring flight.*

*I tow thee with smoothness, and with gentle might;*
*by sun or moonlight. Towing thee with care,*
*yon painted lines show me where.*

*I tow thee fearful of hangar rash; which I must not commit.*
*Yet I tow thee merrily; with grand smiles and grins –*
*to which I admit.*
*I tow thee with the breath and tears of all my life.*

*And, if God does so allow to wit: promise to tow thee lovingly*
*I do, with each towing experience, I humbly accrue.*

*I tow thee tenderly, with childhood dreams that I keep, gliding*
*smoothly on the ramp, with admiration, love and a Jeep.*

### An Elevated Fraternity

Readers have called this column "quirky and eccentric yet insightfully eclectic." Those are atypically esoteric words to come from left-brain aviators. But *T &T* readers rise from a philosophically elevated fraternity of owner-operators. We can problem solve and make decisions as we operate an airplane, practice, firm or corporation with the left side of our brain, and then side-step to the parallel, right side with equal intensity as we embrace the sensory-symphonies of love, life, our livelihood and flying. When writing for such a fraternity, especially about a topic as potentially utilitarian and boring as towing an airplane, you'd best do it in a unique, perhaps quirky fashion; something to engage both sides of the brain. Well, a story about aircraft towing that begins with an emotionally laden anthropomorphic sonnet? That's a quirky, eccentric and insightfully eclectic approach to towing – and certainly unique. After all, we're only moving an airplane from place to place. How difficult can it be and what else is there to know? What else indeed grasshopper. There are challenges and threats that our left brain must negotiate if we are to indulge our right brain's passionate perspective on the potentially problematic procedure.

### Neither Snow nor Rain

The Duke is the first aircraft I've owned that could not be moved in and out of a hangar manually by one person. Initially, I had an FBO accomplish the towing. After moving from Arizona to Michigan, I needed a way to tow the Duke by myself in an environment where tow-it-yourself inhibitors are plentiful. But neither snow nor rain nor heat nor gloom of night nor upslope into the hangar should stop me from the swift completion of the appointed tow. Scott Johnson is a local pilot in our Winter Wonderland of slipperiness and owns both an award-winning C-180 and a welding shop. And after 20-plus years, he has plenty of experience with creative metalworking. Scott manufactured an extra-long tow bar (so that I could see the towing limits on the nose strut—more on this in a bit) to use with a trailer hitch that was welded to the front frame of my 4WD Ford Explorer. When I recently replaced the Ford with a Jeep, its bumper, grill and the shielded, rock-crawling underside didn't facilitate the same type of trailer hitch adaptation. There are, however, two red towing hooks that presented an opportunity for Scott's creativity. This time he manufactured an adapter to fit over the Jeep's hooks that included a trailer hitch ball. Your own towing setup may necessitate similar creativity, but whatever method you devise, the mechanical and procedural considerations for safe DIY towing will be similar.

Due to the threat of hangar rash, liability and (lack of) driver ability, most shared, FBO and community hangars require that only those trained in the nuances of towing conduct the maneuver. Moving the plane ourselves is therefore predicated on us having our own hangar, a means of towing and possessing trailering skills. In addition to having the skill to tow both forward and backward, our tow-vehicle must have the power, torque, traction and tow bar attachments to manage the task. Pilots tow their aircraft using a wide variety of machinery including tugs large and small, electric and gas; they use cars, trucks, farm tractors, four-wheelers and riding lawn mowers. Initially, I tried several types of walk-along towing machines and a riding mower, but traction was inadequate for the snowy incline into the hangar. I settled on the Explorer and now a Jeep. Towing a single, a cabin-class twin, Citation, GV and a 787 all require a different tug, attachments and a different skill set. The larger our aerospace vehicle, the more difficult these personal and equipment parameters are to achieve.

## A Man's Got to Know His Limitations

*– Harry Callahan (Clint Eastwood), 1973*

While not as perilous as tugging (pun intended) on Superman's cape or challenging Dirty Harry, towing can be a hazardous operation, causing damage to the aircraft and injury to personnel. Once at my carrier, and unbeknownst to the Captain and crew, the NLG spray shield was damaged during push-back from the gate. This resulted in the nose gear failing to extend on landing. Other common towing errors include attempting to move the aircraft with its brakes set or chocks installed, pushing or pulling the aircraft into another object or damage due to aggressive maneuvering or exceeding angular towing limits. Personal injuries can occur when attaching and detaching towing equipment and to others when they intrude between the tow vehicle and the airplane. We may also cause damage or injuries if the tow bar becomes disconnected during movement. Here is a left-brain checklist in order to help us avoid some costly mistakes:

- Aircraft equipped with a tricycle landing gear are generally towed by attaching a model-specific tow bar to the axle of the nose wheel, to designated tow pins, or by lifting the entire nose wheel assembly. Most tow pins are designed to "shear" before other, more critical, aircraft components – this means the pins are fragile by design.
- Internal or external flight control locks should be used while the aircraft is parked – but use caution when towing. Some control locks for the rudder system will inhibit towing and cause damage to aircraft springs, cables or linkages if not removed prior to towing.
- Before towing, confirm the aircraft parking brake is released, chocks and tie-downs are removed and the area is clear of obstacles – including the hangar door. To verify the parking brake is off, I push on a wingtip and verify that a MLG tire rotates a smidgeon. Common obstacles include trash cans, torpedo heaters, step-stools, luggage and luggage carts.
- Chocks should be available in case the tug and aircraft become separated from each other. I've had three of these free-wheeling events at the airline but none in GA.
- Contact ground or advise other aircraft on the CTAF if entering movement areas and tow along painted taxi lines when able.
- Most GA aircraft do not have a full swivel mode on the NLG locking scissors. Instead, we have markings to designate maximum towing angles (typically marked in red on the nose strut). It is critical to remain within these limits. If you reach the left or right limit, you should stop, disconnect the towing vehicle and maneuver the tow bar and vehicle to remain within limits, then reattach the tow bar and resume the tow.
- No one should be permitted to walk or ride between the nose wheel of an aircraft and the towing vehicle, nor ride on the outside of the airplane or the towing vehicle.

I've been towing GA airplanes and Air Force fighters for 45 years, and I can usually push the Duke to within my self-imposed ¾-inch parking spot tolerance in the hangar – albeit not always on the first attempt. While acknowledging the challenges of towing, or reading poetry about towing, I advocate self-towing for the same reason I have suggested that we all get more hands-on with aircraft maintenance (see "Zen and Aircraft Maintenance," T&T July 2015). Because becoming more touchy-feely with our maintenance and towing can provide knowledge, which leads to understanding, skill, appreciation and gratitude.

## Accept the Challenge

The functional elegance of towing is often lost on us pilots, overshadowed by the left-brain efficiency, ease and convenience of a professionally prepositioned aircraft. While towing your own airplane will take some skill, there's no need to snatch a pebble from your sensei's hand – just get some dual with your own tug, tow bar and airplane before you go solo. And if you will accept the challenge of towing, I will abandon the challenge of poetry. T&T

**Kevin Dingman** *has been flying for more than 40 years. He's an ATP typed in the B737 and DC9 with 23,000 hours in his logbook. A retired Air Force major, he flew the F-16 and later performed as an USAF Civil Air Patrol Liaison Officer. He flies volunteer missions for the Christian organiz tion Wings of Mercy, is employed by a major airline, and owns and operates a Beechcraft Duke.Contact Kevin at* **dinger10d@gmail.com**.

# En Route

## Ice Shield Introduces New Wing Boot Application

Ice Shield De-Icing Systems recently announced the launch of Ice Shield PSA, a Pressure Sensitive Adhesive (PSA) installation application that will reduce installation labor and allow minimal aircraft downtime when replacing wing de-ice boots.

Ice Shield's PSA product line is said to provide a faster, neater and easier installation compared to the traditional contact cement installation. Ice Shield PSA boots can be inflated just two hours following installation. PSA parts are offered for most of the company's catalog of certified Ice Shield wing boots, allowing customers to have a choice of either the PSA application or traditional contact adhesive application.

"We are thrilled to announce the new Ice Shield PSA product line and showcase the quality and reliability of our new parts," said Peter Murdza, director of sales and marketing at Ice Shield. "All Ice Shield PSA parts are guaranteed to be delivered within 72-hours or less."

To learn more, visit *www.iceshield.com/PSA*. T&T

## AeroSearcher: A New Way to Search for Aviation Products

Startup company AeroSearcher recently announced the launch of its aviation-specific search engine which enables an internet search of three primary types: aircraft for sale, aviation jobs and aviation parts and products. The company expects this tool to be useful among aviation enthusiasts and professionals alike.

"Prior to the launch of AeroSearcher, individuals looking for a plane, an aviation job or a particular product needed to visit five, six, maybe even ten different websites to view the majority of available options," said Todd Hogan, one of the co-founders of AeroSearcher. "Now, the aviation searcher can find what they're looking for in seconds."

AeroSearcher explained that they do not store listings on their actual site, but by the use of filters and keywords, direct users to various aviation websites and listings. The search engine indexes more than 20,000 aircraft, 30,000 aviation jobs, and 50,000 aviation parts and products. To give it a try, visit *www.aerosearcher.com*. T&T

## Ad Index

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# How to Train an Astronaut

"Hey Dave, I'm getting my Mustang type rating next month at FlightSafety. Would you ride right seat in the simulator and mentor me for the class?"

While I have heard this request before, it has never come from an astronaut – and an impressive one to boot. Charlie Precourt, a veteran of four shuttle missions, a former chief astronaut for NASA, a guy who has flown over 100 airplane models with over 10,000 hours in his logbook, wanted me to teach him something!

"Well sure," I said a little intimidated. I forgot to mention that Charlie is also the chairman of the Citation Jet Pilots Safety Committee and flies his own CJ1+.

I had a little prior experience with Charlie, however. A year ago, I invited him to fly right seat in my Mustang on a leg from Houston to Dallas. On that trip, he hand-flew the entire time. "Dave, did you notice that your airplane is slightly out of trim?" "Well no," I replied. "I've been flying this thing for 18 months and haven't felt it."

Charlie touched the aileron trim button for a fraction of a second. "Now it's perfect," he proudly pontificated. I proceeded to mutter something under my breath.

Charlie's landing, his first in a Mustang, was of course flawless. You know, the kind where you don't ever feel the touchdown. As we taxied off the active, I put my hand on his shoulder and said, "It's okay Charlie, just keep working on it and your landings will get a little better each time."

Charlie was not doing much for my ego.

But now I found myself at FlightSafety in Wichita with this model of aviation perfection. By the third sim session, Charlie was way better than me, even after my 10 years of biannual recurrents.

Then it dawned on me: Charlie's brain is much larger than mine. This is clearly visible from the displayed photo. He was simply born with an unfair advantage. That night at dinner, Charlie went on and on about phi-to-beta ratio, Q alpha feedback and something called Delta P. I nodded as if I understood. During dessert, my phone rang. It was my wife, Patty. "Are you still the best Mustang pilot in the world?" she asked.

"Absolutely, positively," I shot back. "I have told you that for years. Nothing's changed. But Charlie is getting dangerously close. And I think he is mad at Delta airlines."

For several days, I simply watched and learned from the guy I was supposed to be coaching. But I used every opportunity to impress him with my non-aviation acumen – like the closest fast food locations to the training facility.

"You've never been to Chick-fil-A?" I asked. "Never," he said.

I breezed in and instructed him on how to order. He seemed confused. "Do we take a number or do they bring it to us?" "Just watch me," I said.

Now I had a purpose – a mission. Not in space. But in chicken.

Fly safe.

*With 6,000-plus hours in his logbook, David Miller has been flying for business and pleasure for more than 40 years. Having owned and flown a variety of aircraft types, from turboprops to midsize jets, Patty and David currently own and fly a Citation Mustang. You can contact David at* **davidmiller1@sbcglobal.net**.

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