TWIN & TURBINE

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

AUGUST 2018 $3.95 US

VOLUME 22 NUMBER 8

Quest Introduces Kodiak Series II

A Letter Answered

Stability, Steep Turns & Spirals

Five on the Fly: Randy Groom

Kevin Dingman: Sunday Drivers

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by **Rebecca Groom Jacobs**

Like Father, Like Daughter(s)

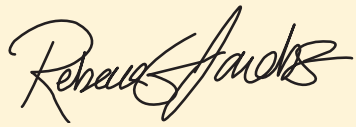
I feel it is necessary early on in this role to further introduce my father Randy Groom, who's insights and support has been invaluable to me throughout my young career. He is ultimately the reason that both my sister and I entered the general aviation industry, and someone we both continue to turn to for counsel and inspiration.

As a 35+ year veteran in the GA industry, and an 11,000+ hour owner-operator, my father has a wealth of knowledge and experience that aligns neatly with many of the topics discussed within *Twin & Turbine*. His aviation career began humbly as a CFI and charter pilot prior to three decades spent working his way up to becoming a highly-respected executive leader for both Beechcraft and Piper. In 2008, he started consulting firm Groom Aviation and has since helped dozens of well-known business and general aviation companies improve their sales, support and product line strategies.

Now, the purpose of this information is not to tout his skills or services, but to simply establish his credibility. He's not only important to me in my personal life, but also as a member of my aviation 'inner-circle.' As Editor, I consider it my job to surround myself with experienced and passionate industry veterans to ensure that I continue to provide multi-faceted and relevant aviation journalism that *Twin & Turbine* is known for.

Coincidentally, he also happens to be considered a mentor by one of *my* mentors; a name you all are very familiar with: Dianne White. So, to help introduce him and tap into some of his industry knowledge, Dianne gladly interviewed him for this month's "Five on the Fly" feature. I encourage you to take a look (page 16) as he responds to questions associated with the health, costs and new technologies in today's world of GA. And do not be surprised if you see his authorship in the future. I am biased of course, but I don't imagine I'm alone in thinking there is a lot we can learn from his experience.

My father is ultimately the reason that both my sister and I entered the general aviation industry.

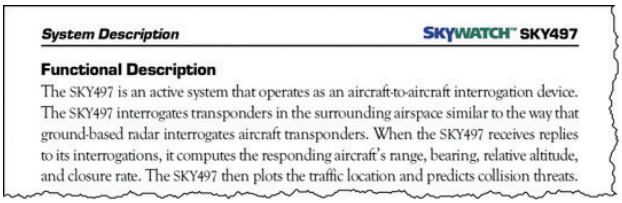


P.S. I would also like to take the time to thank everyone who participated in the Twin & Turbine readership survey. I was thrilled to see the number of responses we received. Your feedback is truly invaluable to our mission, and to the future of this magazine. Please do not hesitate to contact me with additional feedback or comments at any time.

Airmail

In Response to Thomas Turner's "On a Swivel"

In Thomas P. Turner's article in the June issue, he states that in order to be detected by TCAS or TCAD a transponder-equipped target (a Cessna 150 in his example) must be "in radar contact with ATC" and that "even if the aircraft had a transponder, the transponder would not be emitting a signal to be picked up by the Citation's TCAS." In fact, "active" TCAS and TCAD traffic systems (such as Skywatch) broadcast their own aircraft-to-aircraft interrogation signals, which all nearby transponders will reply to whether or not they are being interrogated by ATC. This is actually one of the chief advantages of an active TCAS or TCAD, in that they will detect nearby transponder-equipped traffic even if they are so low that ATC radar is not painting them. Here's an excerpt from a typical Skywatch manual proving my point:



System Description SKYWATCH™ SKY497

Functional Description

The SKY497 is an active system that operates as an aircraft-to-aircraft interrogation device. The SKY497 interrogates transponders in the surrounding airspace similar to the way that ground-based radar interrogates aircraft transponders. When the SKY497 receives replies to its interrogations, it computes the responding aircraft's range, bearing, relative altitude, and closure rate. The SKY497 then plots the traffic location and predicts collision threats.

Gordon
Santa Barabara, CA

Thomas Turner responds:

You are absolutely right that TCAD and TCAS are active systems that trigger a response from transponder-equipped airplanes which then (in most cases) will appear on the display in the airplane that sent the interrogation. That system works quite well – most of the time. The passage you cite, and item #3 that follows, explain why this probably would not have been in the case that prompted June's article.

Transponders are line-of-sight radios. The descending Citation's active traffic system signal would probably have been blocked by the Cessna 150's wings and fuselage from reaching the trainer's transponder antenna on the belly of the airplane. Any signal that might have been sent from the C150's transponder would likely have been blanked out from the Citation's position above.

I point this phenomenon out to my students in flight when the opportunity arises; airplanes approaching near head-on but slightly below our aircraft will commonly appear on the TCAD screen until they're within a mile or so, and then disappear from the scope as the target airplane's structure comes between us and its bottom-mounted transponder antenna. If I'm lucky on a training flight, I can show that the biggest threat, a nearby airplane at our altitude and turning toward us, will be indivisible on our display. I remind pilots that the way to use our cockpit traffic display is to identify airplanes as far from us as possible and then acquire them visually, so we can avoid them if they come close enough they may disappear from our scope.

Back to the article: my point in the entire discussion on traffic avoidance displays is that they are extremely helpful in visually acquiring other airplanes, but like most technology, to use it effectively we need to know its limitations as well as its strengths.

A Letter Answered

Dennis Mason with some of the brochures that the Cessna marketing department sent in response to his letters as a 10-year-old in 1963.

Earlier this spring, I got wind of a remarkable letter that Cessna had received from a recently retired employee from the company's Independence, Kansas manufacturing plant. As you may know, Cessna built the facility adjacent to the Independence Municipal Airport (KIDP) when it restarted production of its single-engine piston aircraft following the passage of the General Aviation Revitalization Act. Since then, the company has built more than 11,000 Cessna 172's, 182's and Cessna 206 aircraft, which are now in operation around the world.

The letter was written by Dennis Mason, a sheet metal assembly worker from Fredonia, Kansas, which is in the southeastern part of the state. After talking with him on the phone for nearly an hour, I knew I had to share his story.

Dennis grew up on a farm near Fredonia and at some point in his childhood, he became fascinated with airplanes. As a 10-year-old in 1963, he began writing letters to Cessna requesting any brochures or product information they could send. Within a week of sending his letters – without fail – he would receive an envelope stuffed full of brochures about all of the aircraft in the Cessna product line. Dennis said that act sparked a love for flying that would last his entire lifetime.

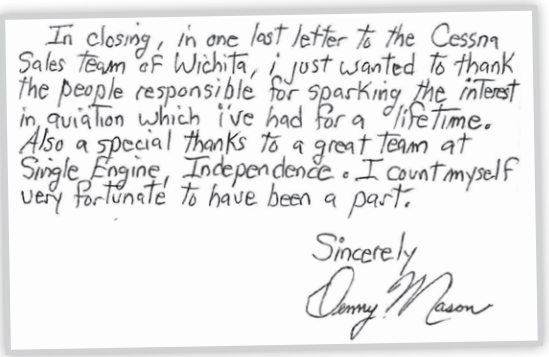
As a teenager, he joined the Fredonia chapter of the Kansas Civil Air Patrol. The chapter owned a Cessna 140 and held ground school classes every Tuesday evening. Dennis' father didn't support his interest as a close relative had been killed in a plane crash. Undeterred, Dennis walked five miles from the family farm into town so that he could attend the CAP class each week. At the conclusion, he would walk the five miles home in the dark.

After graduating from high school, Dennis became a welder but never gave up his dream of flying. He was fortunate to meet Roy Hartwig who owned an FBO and Cessna dealership in nearby Coffeyville. Roy recognized the spark in Dennis' eyes, and did everything he could to feed it. For a summer, after working all day at his welding job, Dennis washed the greasy bellies of Cessna's in exchange for an occasional ride in one of Roy's inventoried aircraft. He also began taking flying lessons, although he had little money to afford it. It wasn't until May 1980 that Dennis finally earned his private pilot's certificate. Afterward, his instructor told him he was the only student to earn his certificate 30 minutes at a time.

When Cessna began building its single-engine manufacturing plant in Independence in the mid-1990s, Dennis immediately applied for and got a job making what he called these magnificent planes. "I took a pay cut to work at Cessna, but it was what I wanted to do," he said. "Every day was a dream come true working for Cessna."

Over the course of his 20-year career, he built every wing strut for every Cessna single-engine airplane up until the day he retired on Jan. 4, 2018. He also built spares for older Cessna's. If you do the math, that's more than 22,000 wing struts. Today, as a retiree, he's still a passionate Cessnan through and through. You can hear it as he talked about his lifelong affection of the planes he lovingly built and flew through the years. If Dennis decided to give blood, I'm pretty sure he would bleed Cessna red.

Back to the letter Dennis wrote to Cessna earlier this year. This final letter to the company that took the time to respond to a 10-year-old with a yearning desire to learn about airplanes. Here's how he closed it out:


In closing, in one last letter to the Cessna Sales Team of Wichita, I just wanted to thank the people responsible for sparking the interest in aviation which I've had for a lifetime. Also a special thanks to a great team at Single Engine, Independence. I count myself very fortunate to have been a part.

Sincerely
Danny Mason

As I walked through the many miles at Oshkosh, I couldn't help but peer into the young faces of the kids trailing their parents, necks craning to the sky. Do I see the same spark that prompted Dennis to walk five miles each way to ground school? Do they find themselves dreaming in three-dimensional abandon high above the earth? Does that kind of passion for aviation still exist in teenagers today? For some, the answer is certainly yes.

But here's the key thing I took away from my conversation with Dennis: One small act of kindness – a letter answered – changed a life. And it fanned a spark that led to a successful career in aviation and the dream of becoming a pilot fulfilled.

Just one small act. It's our move. T&T

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

Quest Introduces

The latest derivative of the utility turboprop offers a sizeable list of technical improvements.

by **Joe** Casey

Throughout my career in aviation, I've been fortunate to pilot a great spectrum of aircraft, both civilian and military. But if I had a "home," in this industry, it would be in the single-engine turbine market. I'm most notably an instructor in the PA46 community, but I have flown several other single-engine turbines as well. Most recently, I had the privilege of being one of the first to fly the latest and greatest from Quest Aircraft Company: the Kodiak 100 Series II. When I was approached about a possible test flight, I jumped at the opportunity.

Kodiak Series II

PHOTO COURTESY OF CLINT GOFF

Initial Thoughts

My interest in the Kodiak stems from a longtime appreciation of missionary aviation and the pilots who commit their careers to a worthy cause. Humanitarian efforts are exactly what the Kodiak was originally designed for in the early 2000's. But, as I learned during my time with the airplane, the "decade of improvements" Quest has since made to the Kodiak renders the Kodiak Series II a totally different animal than the original. Though it is just as rugged and backwoods-savvy as its predecessor, the Series II has a laundry list of digital/technical improvements making this airplane not only safer, but just as capable of transporting people and their cargo around the concrete jungle as it is in the real jungle.

I met with Quest Chief Demonstration Pilot and Marketing Director Mark Brown when he flew N247QK into my home airport (KJSO). It was a hot afternoon, with the temperature rising over 93 degrees F. Typically, when the sun is high on a summer day in Texas, you will not find anyone standing around on an asphalt ramp. Yet when the Kodiak Series II arrived at KJSO that afternoon, people came out of the woodwork to take a look. We probably appeared similar to a herd of cows hovering under a lone oak in a sunny field – the Kodiak wing acting as our tree, providing abundant shade. It's impressive just how many people can stand completely upright under the tall wing.

One of those standing under the wing was Jimmy Stewart. No, not the actor, but an A&P mechanic and commercial pilot/instructor based at my home airport (KJSO). Jimmy aspires to one day fly missionary work and there is a high probability the Kodiak will be his future steed in a faraway country. So, he eagerly joined me to try out the Kodiak Series II.

As we all stood underneath the Kodiak, I quickly realized that it was not only one wing, but two above us. Not a cuff or a leading edge device, but quite literally two wings mated together mid-span that simply share a spar and nothing else. This unique design offers particular flight characteristics I would later experience (and appreciate) during the flight.

Quest offers three interior options: Tundra, Timberline and top-of-the-line, Summit (shown here).

Loading Up

Our plan was to fly to the Flying M Ranch in Reklaw, Texas. The Flying M is home to one of the best and largest fly-ins in the state, and we were honored that owners Dave and Marcia Mason allowed us special access. Lined with beautiful tall pine trees, the 3,500-foot grass strip at the Flying M Ranch provided a perfect backdrop for pictures, and also allowed us to explore the Kodiak in its element: an unimproved airstrip in the backcountry.

Mark offered me the left seat (for which I felt quite honored) and I climbed aboard. My next observation cannot be overstated: I am 6 feet 4 inches tall and I was comfortable. There seems to be an unwritten rule that every cockpit must be designed for pilots 5 feet 7 inches or shorter – bad news for us tall guys. But for the first time in my 30-plus year career, I actually had to move the seat forward. And I didn't have to contort my body in some odd manner upon entering the aircraft either. The pilot door swings super wide allowing for easy access as you pull yourself in using one of the many handholds. It's a bit like stepping up into a four-wheel drive truck in that you use the step, but it's easy and natural.

You will probably notice several truck metaphors throughout this review, and that's not on accident. Texans love trucks, and I could not help but note the similarities to my own truck. But this is no bare-bones, basic "ranch truck." No, the Kodiak Series II is akin to the top-of-the-line, decked out, leather, incredibly comfortable, ready-for-anything truck that the ranch owner himself would drive. Maybe the Ford King Ranch, Chevy Silverado High Country or the Dodge Laramie Longhorn of the aviation world. Quest wanted to make a statement with the Series II, and they made it loud and clear: this is one well-refined, super-safe "flying truck."

Test Flight

Once settled in the left seat, I noticed the ground clearance in the Kodiak is excellent. The pilot sits "tall," meaning that the perspective is that you are quite high off the ground. I instantly liked the feel of the airplane.

Starting the engine was intuitive as I minded the normal hot start cautions I am used to with any PT6. Soon we had the G1000 NXi up and running, and I felt right at home. When you think of a Kodiak, set aside any notions you may have that this

What's New with Series II?

The biggest changes are up front in the cockpit, but Quest also made a few luxe improvements throughout the cabin.

New standard features:

- G1000 NXi Suite
- FlightStream 510
- Safe Flight ARNIC 429 AoA Indexer
- Accessory Gear Box Chip Detector
- Two new panel gloveboxes
- Cockpit voice and data recorders
- New wing-root sealing (noise/fume reduction)
- Improved Rosen sun visors
- Improved cargo door step functionality

New optional features:

- GWX70 Weather Radar
- Single-Point Refueling (left wing root)

The Kodiak, Then and Now

The team at Quest Aircraft likes to tout that they've spent the past decade continually improving the Kodiak. Some of the major updates throughout the past ten years include:

- Increased take-off and landing weights
- Inflatable door seals added
- Nose strut and drag link refinements
- Major air condition system upgrades
- Multiple payload increases
- New cabin lighting system
- Multiple new interior options, including executive style
- Airframe Fatigue life doubled
- TKS tank made available in the cargo-pod (vs. fuselage)
- Carbon-fiber Aerocet floats certified

airplane is rustic or bare in amenities. It has all the bells and whistles found in the nicest of other single-engine turbines. The all-glass G1000 NXi panel is intuitive for anyone even remotely familiar with Garmin products. Blue button? Yes. Envelope protection? Got it. Under-speed protection? Yes, sir. Basically, the Kodiak has every safety-related feature offered by Garmin. As Brown puts it, "At Quest, safety is always standard." The company takes pride in the Kodiak being the safest airplane in its class, so all safety related equipment comes in the base model (including Synthetic Vision).

I found taxiing of the airplane to be "Cessna 172-easy" with no unusual quirks. The turning radius was so tight I could literally rotate on one main wheel. Even on the ground at idle, the dual-zone air conditioning did a remarkable job cooling the cabin despite the Texas heat.

I personally think the -34 engine (found also on many JetPROP conversions with which I am familiar) is one of the best versions of the PT6. Quest chose this version for its ability to generate power down low (the compressor is tuned for low-altitude operation) and power for its weight (it's one of the biggest of the "small-block" PT6's). When I advanced the power lever, the acceleration was brisk. We rolled a seemingly short distance before reaching rotation speed (about 60 mph) and were soon climbing at 1,300 fpm at 110 KIAS.

At that rate of climb, we had enough altitude within minutes to do some maneuvering. I first reduced the power and established slow flight just above the stall, and found the flight characteristics "gentlemanly." In other words, honest and predictable. I then attempted a stall with no flaps deployed: this is where the flight got interesting. I recovered from the first

The all-glass G1000 NXi panel is intuitive for anyone familiar with Garmin products.

stall attempt in a normal fashion with the elevator forward at the stall first sign of a stall, which was a non-event. On the second attempt, Mark recommended that I just hold the yoke all the way aft and fly it around. While I was a bit perplexed at this request (and watched for the wing dip that would signal an imminent spin), I found that the airplane was completely flyable in a full stall. With the stall horn sounding loudly, the ailerons remained completely effective as the airplane descended around 1,000 fpm.

It was unlike anything I have come across before. I think Quest is really onto something with this wing design, as the stall/spin accident scenario is unquestionably the deadliest killer in general aviation and this design represents a solution. As an instructor in the single-engine turbine community, I'm on the forefront of the battle to train and educate against the perils of the stall/spin, loss of control accident scenario. So, it is refreshing to see Quest on the leading edge (pun intended) of this battle through aerodynamic design. In other single-engine turbines, if not properly recovered, the stall/spin is often deadly

PHOTO COURTESY OF CLINT GOFF

The 3,500-foot grass strip at the Flying M Ranch allowed us to explore the Kodiak in its element: an unimproved airstrip in the backcountry. (L-R) Ashley Atkinson; Mark Brown; Jimmy Stewart; Rhett Smith; Joe Casey; Dave Mason.

as the descent rates are not survivable at ground impact. The 1,000 fpm descent rate in the Kodiak is more likely survivable, being even less than the descent rate of a Cirrus SR22 with a deployed parachute. While I'd not recommend anyone conduct this manner of flight technique, it is encouraging to see that the Quest Kodiak has such capacity.

Another cool feature is the automatic trimming of the pitch trim when flaps are deployed. In airplanes with super-effective flaps, a large amount of pitch trim is required when the flaps are extended or retracted, and the Kodiak automatically inputs the trim. Simplicity in design equates to additional safety.

Backcountry Fun

Once we wrapped up our maneuvers, we leveled off at cruise speed and pointed the nose toward Flying M Ranch. At 5,500 MSL, we were burning 330 pph and cruising at 180 KTAS. While that might not be impressive as compared to other turbine aircraft at flight levels, 180 KTAS still covers the ground quickly, and the fuel burn is commensurate with the altitude at which the Kodiak is intended to operate. This airplane is not meant to compete with singles like the Meridian or TBM for cross-country performance, but is still a very capable cross-country airplane.

While the G1000 NXi is fully IFR capable and has the ability to navigate all of the various instrument approach types, it also has "visual approaches" available in the database for many of the other public paved runways in the United States. This is especially handy when the desired airport offers no instrument approach, or if a second runway is deemed better for use, possibly better aligned with a strong wind.

In this case, the Flying M is a private turf airport and no instrument approach or visual approach is available in the G1000 NXi for its runways. However, the Kodiak still offered several tools to assist with the approach and landing. I used OBS Mode coupled with Synthetic Vision to create a nice approach course to the turf runway, along with a Flight Path Marker to create a steady approach angle to the runway. The AOA (angle of attack indicator) showed just where to pitch the nose for best performance. Although I was approaching a grass strip without an instrument approach, I still had a plethora of digital data to guide me to a safe approach and landing. And I must have shown a decent level of aptitude on this first approach

for Mark let me fly the entire approach to the ground.

Touchdown and landing was cakewalk-easy with the big tires, great visibility and reverse thrust of the PT6. I'm not sure how short exactly my landing roll ended up being, but to give an idea, I stopped mid-field on my first landing after having crossed 100-foot pine trees at the end of the runway. And that was without my really trying to "land short." Said simply, the STOL characteristics of the Kodiak are impressive.

Having too much fun, I performed approach after approach at the grass strip. I tried them all: short-field technique, with flaps, without flaps, both reverse and no reverse, etc. In every regime of flight, I found the Kodiak behaved predictably. After a while, we shut down at the Flying M to take pictures and talk with owner Dave Mason. Then it was Jimmy's turn at the helm. I somewhat begrudgingly gave up the front left seat and took a seat in the back.

Loading into the Kodiak as a back-seat passenger is a non-event. There is huge door on the left side of the fuselage, making it easy to load just about anything. For the missionary/humanitarian mission, I could see pallets, medical supplies and logistical items easily being loaded. For the outdoorsman, I could envision fitting all the necessary equipment needed for a backwoods trip. If you like to "get away," I can think of no better vehicle to get you, and just about anything you'd ever want to take, there.

Honest Machine

Although I was only looking at the back of Jimmy's head from my backseat perch, I could see him smiling widely as he took over the flight duties. I've flown with Jimmy often at JSO, and I know he's an excellent pilot. But, he's still a 500-hour aviator, and I wondered how he would handle the step up into the turbine world. Well, I soon observed Jimmy had no trouble with the transition into the Kodiak. He masterfully flew us back to JSO, handling the airplane like an experienced veteran. My point is that the Kodiak is powerful and capable, but most of all, predictable. While anyone new to the airplane is going to assuredly go through training to learn the intricacies of the machine, it is without quirks. It's an honest machine, doing exactly what you tell it to do. In all, I found it refreshingly simple.

Once Jimmy landed back at JSO, we were met by a second crowd of onlookers. We then said our goodbyes to Mark and gathered to watch the Kodiak takeoff from Runway 32. As I watched the Kodiak fade off into the distance, I sensed that this airplane is poised to be a strong contender in the market as more pilots become aware of it and its offerings. While Quest is assuredly not trying to be the next behemoth in aviation, they are absolutely carving out a solid niche in the single-engine turbine market. 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.*

PHOTO COURTESY OF PAUL BOWEN PHOTOGRPAHY

The Speed of Stupid

by **Scott Kraemer**

For every action, there is an equal and opposite reaction.

– Newton's Third Law

During my time as a professional pilot, I was amazed how frequently Newton's third law of physics was proven. And just how often Newton's "ghost" revealed itself in the aviation world. I found that the compound effect of that particular theory mixed with the element of time can either take the form of a welcomed blessing or an unwanted curse. Hence, things in motion can be subject to unexpected and devilish cause and effect. Here is a case in point.

After several years working for Beechcraft, I had elevated my status to Demonstration Captain and Regional Sales Director. In those days, I was covering five Midwest states (in which I spoke four of the five languages). It was a dynamic and incredible ride. But make no mistake, simultaneously flying and selling demands extreme professionalism as they are two very different responsibilities.

Selling required product knowledge, personality, honesty and relationship building. While performing pilot duties required training, discipline and intense check rides. But once you passed this gauntlet, the ability to perform both roles was especially useful in two cases: when single pilot operations were necessary, and when demoing an owner-operator. It also presented a great opportunity for customer bonding as long as you kept it safe and used good judgement. The following is a true "Newton ghost story" that took place many years ago when the King Air B200GT was first introduced to the market.

The mission was simple: depart Wichita (ICT) at 6:30 a.m. CST; arrive Centennial Denver (APA) 7:30 a.m. MST for an 8:30 a.m. owner-flown pilot demo. The demo would be followed by a client meeting then I would return to Wichita by early afternoon. The weather was clear and calm, however, there had been forest fires near Colorado Springs which had died down overnight.

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Rotating Side Pads
Up for storage, horizontal for use. Provides comfort and stability. Side cushions are easily replaceable.

Digital Active Noise Cancellation
Significantly reduces ambient noise, allowing users to lower radio volume and hear what they need to hear.

Tap Control for Talk-Through Communication
Double tapping either earbud optimizes that side for communication outside of the intercom without having to remove an earbud.

Active Equalization
Automatically shapes and equalizes the incoming signal for enhanced clarity and intelligibility.

Control Module
Ergonomic design, provides control of headset's primary functions. Configuration switches located inside provide additional customization settings.

Quick Release Side-Swappable Mic and Down Cable
Easily mount the boom mic and down cable on either side of the headset. No tool required.

Adjustable Boom Mic
Remains stable with head movement and through turbulence.

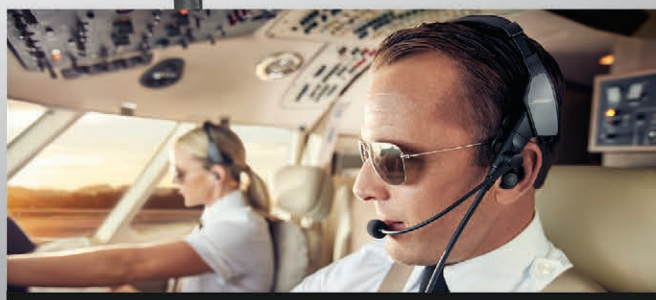
Replaceable Silicone Eartips
Silicone material provides a more comfortable fit. Three sizes included. Easily removed and replaced without tools.

Electret Noise Cancelling Mic
Increases clarity and reduces background noise when transmitting, ideal for aircraft with "hot mic" or PTT systems.

We took 30 years of Bose research and innovation, incorporated more than 30 U.S. design and utility patents, added new features ...

... and fit it all into 4.9 ounces on your head.

Designed for the professional pilot, the Bose ProFlight is the industry's smallest, quietest and most comfortable active noise cancelling communication headset, and the most advanced that Bose has ever produced, with many new features designed specifically for airline and corporate flight decks.



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A billow of smoke similar to what Kraemer experienced in flight.

I put "Mr. Customer" in the captain's chair and he did a nice job of flying, only requiring some finger pointing to switches and knobs. After departure, we climbed to FL290 on a westbound round robin IFR flight plan. Everything was SOP until our return to the airport. During our descent out of FL210, ATC changed the gate and unknowingly put us on a vector to hell. We soon saw in our path what appeared to be a developing lonely cumulus cloud but nothing showed on the radar. Cleared to FL170, we rammed the cloud at our assigned speed of 200 knots IAS. Then came the rodeo.

It was not a cloud, but the top of one of the forest fires that had re-ignited and was rapidly growing as it ravaged the forest below. The sudden turbulence made us tighten our belts and slow to maneuvering speed. This is where it gets weird. The aircraft felt as if we were balancing on the tip of a needle oscillating on the aircraft's center of gravity. Meanwhile, a heavy smell of smoke filled the cabin and we noticed that the outside air temperature (OAT) had instantaneously increased from -15 degrees Celsius to +40 degrees Celsius. We quickly made the call to ATC to request an immediate left or right vector out of the smoke cloud as well as reported the forest fire's position.

Fortunately, Denver Center handled the request expertly. The vector was granted and everyone following our path was turned as well. Less than a minute later, we were back in smooth, clear air with the only evidence of the mishap being white ash on our de-ice boots. With no apparent damage or engine disruption, we landed back at APA without incident. Once on the ground, we took a long look at the airplane and engines and still only saw white ash residue on the leading edge flight surfaces. So, once the customer and I finished our discussion, I prepared for the next leg of my day: the mission to home base.

First, I called our maintenance gurus with concern regarding the ingestion of the smoke, soot and ash in the engine. They then called Pratt & Whitney. No serious concern was expressed other than recommending an optional compressor wash to clean the aircraft when I got back to Wichita. (Note: A volcano plume would have been a whole different story due to the corrosive pumas in the ash that will certainly damage engine parts and ground the aircraft).

By this point, I was running late and stretching duty time. And heightening the urgency was the fact that the aircraft needed to return to Wichita for maintenance and then be dispatched on another mission later that day. So, I skipped lunch, quickly put on a bag of gas (i.e. jet fuel), filed and launched back to Wichita. A routine run-up, departure and climb to FL290 were executed with no issues. Once at cruise and out of DIA airspace, I engaged the autopilot on the Proline 21 avionics. Enjoying a 75-knot tailwind, I was cooking at 380 kts

groundspeed. It was less than an hour to ICT from the top of climb. Little did I know, Newton's "ghost" had other ideas.

With hunger pains panging, I quickly grabbed a pack of peanuts out of the cabinet behind the copilot seat and proceeded to choke down some nourishment. And then it happened. I was actually choking. I couldn't breathe. My windpipe was clogged.

In desperation, I doubled my fists and thrust them as hard as I could into my solar plexus to attempt a self-inflicted Heimlich Maneuver. After several punches, I exploded with a loud noise (that I'm sure ATC heard) while evacuating peanuts and spittle all over the glass cockpit screens. It was like a shotgun blast. But I was alive and breathing. Using my sunglasses' cleaning cloth and some water, I then delicately cleaned the screens in an attempt to erase the trace of the inflight debacle as I cruised on to home base without any more issues.

Here is the moral of the story. In aviation, on every flight, there are many speeds we have to deal with: V speeds, relative wind speeds, barber pole Mach barriers, electrons moving through systems at the speed of light…you get the picture. And then there is the fastest of them all – the "Speed of Stupid." Had I choked to death, single-pilot, titanic tailwind, on autopilot, no passengers, 6+ hours of gas remaining, I could have had an unconscious range of over 2,200 nm. It would have been a burial at sea. Certainly, something that would have disappointed my wife and kids and positively confused the NTSB investigation. (Unless of course, I was shot down earlier by homeland security after being branded a terrorist).

Take it from me; when flying single-pilot, eat pudding not peanuts. Newton's third law of physics can potentially ruin your life if you don't pay attention to the cause and effect of the simplest things. Even something as tiny as a peanut.

Side note: I deliberated on rather I should to tell this story to anyone until I realized just how many meals we as pilots ate en route, single pilot. So finally, at one of our annual safety stand down meetings (aka "The Day the Earth Stood Still"), I told this story to the group of 300 company pilots. Many laughed, all saw the stupidity and the maintenance guys even said "so you're the guy" as they had found some remaining peanut fodder. But later, I was awarded the never before issued, prestigious "Banana Pudding Cup Award" for my valor and ability to survive my stupidity. T&T

Scott Kraemer *is a 35+ year veteran in the business aviation industry, with 27 of those years spent in the sales and marketing department at Beechcraft Corporation. Scott holds a Commercial Pilot License and has logged over 7,000 hours in more than 50 aircraft models. Presently, Scott is an Executive Director for Holstein Aviation specializing in aircraft acquisitions, sales and consultation. You can contact Scott at* **jscottkraemer@gmail.com.**

FIVE on the FLY

by **Dianne White**

WHO:
Randy Groom
Founder and President, Groom Aviation

Former President, Beechcraft

Former Executive Vice President, Piper Aircraft

HOMEBASE:
Vero Beach, FL

RATINGS:
Commercial
Instrument
Single/Multi Land & Sea
King Air 300/350/1900 Type Rating

HOURS:
11,000 hours

1. ***Throughout your career, you've had a front-row seat to many of general aviation's dramatic changes, consolidations and significant downturns over the last three decades. What key factors need to remain constant to ensure GA will thrive into the next decade?***

   I think the most important factor for General Aviation to return to growth is to attract more young people to flying. As an industry, we need to be planting seeds with kids of all ages that potentially could inspire them to consider aviation as a career or hobby. Programs such as Young Eagles are great, but more youth outreach needs to be done. Invite kids to the airport, to FBO's, give presentations at elementary schools, high schools and universities. Our survival depends on it.

2. ***Because GA is a small industry (with a relatively small number of new aircraft units built and sold every year), the barriers to innovation and profitability can be daunting. What are some of the most promising and exciting technologies or advancements you're seeing on the horizon that have the potential to have a significant impact on aviation?***

   I have always felt that advances in powerplants are key to igniting growth in our industry. I am excited to see efforts continue to improve efficiency of turbine/turboprop engines. Diesel still holds some promise and of course the incredible focus on electric and hybrid is fascinating to watch. Also, advances in safety systems, primarily in the avionics world are moving at a breathtaking pace. I don't think we are far from seeing general aviation airplanes with an auto land capability that could eliminate issues from pilot incapacitation.

3. ***Many in this industry owe you a debt of gratitude for providing mentorship and a leg up in their careers. Who do you consider your heroes that helped you become a successful businessman and industry leader?***

   Wow, I have lots of heroes, but I would have to start with Olive Ann Beech. I never reported to her, but her presence and principles permeated the culture of Beech Aircraft. I learned that a relentless focus on quality and extraordinary customer support were critical to business success. I would also have to recognize George Rodgers, former VP of Marketing at Beech for making a conscious effort to attract young people to the company; without which I wouldn't have had my start. And Rob Wells (former Vice President of Sales at Piedmont Aviation, now CEO at Quest Aircraft) deserves a shout out for recruiting me and thinking I had what

it takes to sell airplanes. He didn't know my only sales experience was a total failure selling greeting cards as a kid.

4. ***What are your thoughts regarding the dramatic increase in costs affiliated with flight training and aircraft ownership as compared to the beginning of your career?***

   Years ago, I remember stopping in Muscle Shoals, Alabama and being horrified that their fuel price for 80 octane was 50 cents per gallon. I told my brother to never stop there because of that and he reminds me to this day to steer clear of Muscle Shoals. So certainly, fuel prices are an enormous contributor to the increase in operating costs. I think advances in powerplant technology can help us on that front. Product liability is another big one that affects everyone from the smallest aerospace suppliers up to the airframe OEM's. It would help if the insurance industry wouldn't be so quick to settle on frivolous cases as opposed to making the effort to fight them out in court.

5. ***Can you describe one of the most unusual airports you have ever landed a general aviation aircraft?***

   I would have to say the Shuttle Landing Facility (KTTS). Recently, our local aviation club was able to get special permission to land on the Space Shuttle strip. I couldn't pass up this incredible opportunity, so a few buddies and I loaded up in my A36 and made the short trip up from Vero Beach. The joke was that it was going to require great skill and heavy braking for me to safely land on the 15,000 foot runway. But we made it without a hitch, and it was such a thrill to be touching down on the same strip that welcomed home so many of our astronaut heroes. T&T

Dianne White can be contacted at editor@diannewhite.com

PHOTO COURTESY OF PAUL BOWEN PHOTOGRPAHY

Stability, Steep Turns & Spirals

by **Thomas P. Turner**

The recent, fatal crash of a vintage military trainer provides valuable lessons for pilots of twin and turbine airplanes as well. The NTSB reports:

…a North American SNJ-5 airplane impacted terrain following a loss of control during initial climb after takeoff from runway 13R at Kingsville Naval Air Station (NQI), Kingsville, Texas. The pilot and pilot rated passenger were fatally injured and the airplane was destroyed. Visual meteorological conditions prevailed. Witnesses reported that the airplane took off on runway 13R and had requested a right-hand teardrop turn for a departure toward the north. The witnesses reported seeing the airplane in a steep right bank with some reporting that the bank angle exceeded 90 degrees of bank. The airplane descended nose low and the right bank angle lessened before the airplane struck the ground.

Stalls and spins get the lion's share of coverage in instruction and in article and videos concerning Loss of Control – In-flight (LOC-I). The record shows that LOC-I events are the most common fatal accident scenario, and most LOC-I events appear to be stalls that often develop into a spin before impact.

There is another LOC-I sequence that is neither a stall nor a spin. It is a natural outcome of aircraft stability, and a characteristic of all longitudinally (pitch) stable airplanes. Yet it is not mentioned by name, trained or evaluated in Practical Tests for pilot certificates or ratings. The sequence is a *spiral dive*, and it is what witnesses of the SNJ crash seem to describe.

Here's how the FAA's *Airplane Flying Handbook* (AFH) explains a spiral, with my emphasis added in bold font:

*A spiral dive, **a nose low upset**, is **a descending turn** during which **airspeed and G-load can increase rapidly** and often results from a botched turn. In a spiral dive, the airplane is flying very tight circles, in a nearly vertical attitude and will be accelerating because it is no longer stalled. Pilots typically get into a spiral dive during an inadvertent IMC encounter, most often when the pilot relies on kinesthetic sensations rather than on the flight instruments. A pilot distracted by other sensations can easily enter a slightly nose low, wing low, descending turn and, at least initially, fail to recognize this error. Especially in IMC, it may be only the sound of increasing speed that makes the pilot aware of the rapidly developing situation. Upon recognizing the steep nose down attitude and steep bank, **the startled pilot may react by pulling back rapidly on the yoke while simultaneously rolling to wings level. This response can create aerodynamic loads capable of causing airframe structural damage and /or failure.***

The AFH recommends this spiral dive recovery technique:

1. Reduce power to idle
2. Apply forward elevator ("unload the wing," i.e., reduce the G load)
3. Roll wings level
4. Gently raise the nose to level flight
5. Increase power to climb power

This excerpt doesn't explain *why* an airplane will naturally enter a spiral or *how* such spirals develop. This lack of emphasis in training syllabi and complete absence in Practical Test evaluation means many, perhaps most pilots may be unprepared to recognize and recover from a spiral. Let's delve into why a spiral is a natural outcome of aircraft stability, how a pilot may enter a spiral (it's not just an attempted visual flight into IMC phenomenon), and why knowing about spirals is important to VFR-only and instrument pilots alike.

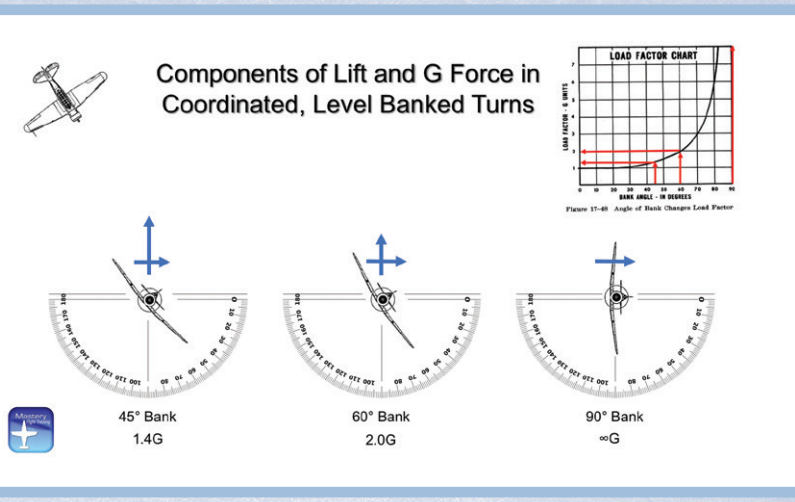
Stability

Most airplanes exhibit some level of stability in at least two of the three axes. Almost all have built-in *pitch* stability. Disturbed upward or downward in pitch and then released, the airplane's nose will oscillate up and down through two or three cycles before it returns to its original pitch attitude…not necessarily on its initial altitude, but at the same pitch attitude, angle of attack and indicated airspeed. Put another way, a pitch-stable airplane will seek the indicated airspeed (actually, angle of attack) for which it is trimmed. If it is disturbed in pitch, or if power or total drag (flap, landing gear position) changes, the airplane will pitch down or up as necessary to remain at its trimmed speed.

Most airplanes also have some level of stability in *yaw*. Kick a rudder pedal and release, or hit a wind shear that yaws the aircraft, and it will wallow back and forth a few oscillations before returning to straight-ahead flight.

Many aircraft are neutral in stability or even slightly unstable in *roll*. Enter a shallow bank and the airplane may remain banked or slowly return to approximately wings-level flight. But bank steeply enough and most aircraft will *not* level their own wings. In fact, in a steep turn most airplanes will continue to bank progressively more steeply. This is sometimes called the *overbanking tendency*, the reason it may take opposite aileron input to maintain bank once established in a steep turn.

You've probably seen diagrams that show the relationship between bank angle and stalling speed (see photo). What's not often well-explained is that this relationship is only valid in level, coordinated flight. If the pilot does not resist the airplane's tendencies and its nose drops to seek the trimmed airspeed, the G load does not increase. In fact, the load factor will increase *only* if the pilot, an autopilot, or a runaway electric trim system resists the airplane's natural tendency to change pitch if it gets off its trimmed speed. *An airplane will not stall on its own*. The pilot (or an automated pilot) has to actively pull against the airplane's stability to *make* it stall.



Steep Turns

What happens then if the airplane enters a steep turn and the pilot provides more or less resistance than is necessary to maintain level flight? We'll use the 60-degree bank example:

- If the pilot adds more than 2G of resistance, the airplane will climb. The nose will rise above the horizon and, if there is sufficient power, the airplane will enter a sustained

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TOTAL MARKET COVERAGE

Jets – 15,630

Chief Pilots & Owners

Count	Aircraft
61	AIRBUS ACJ319
27	ASTRA 1125
30	ASTRA 1125SP
53	ASTRA 1125SPX
42	BEECHJET 400
244	BEECHJET 400A
126	BOEING BBJ
373	CHALLENGER 300
53	CHALLENGER 600
41	CHALLENGER 601-1A
112	CHALLENGER 601-3A
52	CHALLENGER 601-3R
295	CHALLENGER 604
9	CHALLENGER 800
183	CITATION 500
298	CITATION 525
269	CITATION BRAVO
155	CITATION CJ1
84	CITATION CJ1+
206	CITATION CJ2
169	CITATION CJ2+
360	CITATION CJ3
63	CITATION CJ3+
222	CITATION CJ4
146	CITATION ENCORE
46	CITATION ENCORE+
299	CITATION EXCEL
19	CITATION I
249	CITATION I/SP
463	CITATION II
60	CITATION II/SP
163	CITATION III
44	CITATION LATITUDE
140	CITATION M2
377	CITATION MUSTANG
126	CITATION S/II
256	CITATION SOVEREIGN
61	CITATION SOVEREIGN+
238	CITATION ULTRA
238	CITATION V
29	CITATION VI
94	CITATION VII
254	CITATION X
24	CITATION X+
210	CITATION XLS
205	CITATION XLS+
1	DIAMOND I
46	DIAMOND IA
3	DORNIER ENVOY 3
230	ECLIPSE EA500
41	EMBRAER LEGACY 500
133	EMBRAER LEGACY 600
60	EMBRAER LEGACY 650
235	EMBRAER PHENOM 100
239	EMBRAER PHENOM 300
84	FALCON 10
22	FALCON 100
21	FALCON 200
174	FALCON 2000
21	FALCON 2000EX
68	FALCON 20C
16	FALCON 20C-5
24	FALCON 20D
2	FALCON 20D-5
30	FALCON 20E
9	FALCON 20E-5
71	FALCON 20F
68	FALCON 20F-5
206	FALCON 50
7	FALCON 50-40
92	FALCON 50EX
150	FALCON 900
23	FALCON 900C
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285	GULFSTREAM G-450
9	GULFSTREAM G-500
462	GULFSTREAM G-550
70	GULFSTREAM G-II
24	GULFSTREAM G-IIB
140	GULFSTREAM G-III
169	GULFSTREAM G-IV
282	GULFSTREAM G-IVSP
172	GULFSTREAM G-V
36	HAWKER 1000A
10	HAWKER 125-1A
5	HAWKER 125-1AS
6	HAWKER 125-3A/RA
11	HAWKER 125-400A
22	HAWKER 125-400AS
12	HAWKER 125-400B
12	HAWKER 125-600A
6	HAWKER 125-600AS
107	HAWKER 125-700A
56	HAWKER 4000
193	HAWKER 400XP
33	HAWKER 750
191	HAWKER 800A
34	HAWKER 800B
352	HAWKER 800XP
35	HAWKER 800XPI
80	HAWKER 850XP
148	HAWKER 900XP
7	JET COMMANDER 1121
4	JET COMMANDER 1121B
1	JETSTAR 6
6	JETSTAR 731
12	JETSTAR II
10	LEARJET 23
17	LEARJET 24
2	LEARJET 24A
14	LEARJET 24B
39	LEARJET 24D
10	LEARJET 24E
7	LEARJET 24F
16	LEARJET 25
39	LEARJET 25B
10	LEARJET 25C
100	LEARJET 25D
4	LEARJET 28
29	LEARJET 31
167	LEARJET 31A
33	LEARJET 35
380	LEARJET 35A
13	LEARJET 36
33	LEARJET 36A
29	LEARJET 40
194	LEARJET 45
174	LEARJET 45XR
99	LEARJET 55
4	LEARJET 55B
12	LEARJET 55C
261	LEARJET 60
478	PILATUS PC-12/45
111	PREMIER I
7	SABRELINER 40
19	SABRELINER 40A
2	SABRELINER 40EL
1	SABRELINER 40R
24	SABRELINER 60
1	SABRELINER 60AELXM
19	SABRELINER 60ELXM
3	SABRELINER 60EX
68	SABRELINER 65
15	SABRELINER 80
6	SABRELINER 80SC
75	WESTWIND 1
5	WESTWIND 1123
32	WESTWIND 1124
65	WESTWIND 2

Turboprops – 10,774

Chief Pilots & Owners

Count	Aircraft
7	ADAM A500
356	CARAVAN 208
1,202	CARAVAN 208B
2	CARAVAN II
32	CHEYENNE 400
132	CHEYENNE I
13	CHEYENNE IA
264	CHEYENNE II
58	CHEYENNE III
38	CHEYENNE IIIA
57	CHEYENNE IIXL
21	CHEYENNE IV
178	CONQUEST I

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20	KING AIR 200C
19	KING AIR 200T
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181	KING AIR 300
11	KING AIR 300LW
564	KING AIR 350
57	KING AIR 350C
286	KING AIR 350I
19	KING AIR 90
11	KING AIR A/B90
70	KING AIR A100
214	KING AIR A200
58	KING AIR A90
106	KING AIR A90-1
94	KING AIR B100
885	KING AIR B200
95	KING AIR B200C
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95	KING AIR B200GT
4	KING AIR B200SE
22	KING AIR B200T
81	KING AIR B90
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194	KING AIR C90A
358	KING AIR C90B
82	KING AIR C90GT
96	KING AIR C90GTI
125	KING AIR C90GTX
14	KING AIR C90SE
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7	MERLIN 300
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21	MERLIN III
28	MERLIN IIIA
45	MERLIN IIIB
18	MERLIN IIIC
5	MERLIN IV
9	MERLIN IV-A
9	MERLIN IV-C
66	MITSUBISHI MARQUISE
1	MITSUBISHI MU-2D
26	MITSUBISHI MU-2F
18	MITSUBISHI MU-2J
33	MITSUBISHI MU-2K
11	MITSUBISHI MU-2L
18	MITSUBISHI MU-2M
18	MITSUBISHI MU-2N
25	MITSUBISHI MU-2P
39	MITSUBISHI SOLITAIRE
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149	PILATUS PC-12/47
483	PIPER MERIDIAN
3	ROCKWELL 680T TURBO
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5	ROCKWELL 680W TURBO II
6	ROCKWELL 681 HAWK
101	SOCATA TBM-700A
70	SOCATA TBM-700B
293	SOCATA TBM-850
101	SOCATA TBM-900
5	STARSHIP 2000A
73	TURBO COMMANDER 1000
37	TURBO COMMANDER 690
141	TURBO COMMANDER 690A
144	TURBO COMMANDER 690B
83	TURBO COMMANDER 840
26	TURBO COMMANDER 900
55	TURBO COMMANDER 980

Twin Piston – 6,961

Owners

Count	Aircraft
39	BARON 56 TC
1,459	BARON 58
3	BARON 58 PA
351	BARON 58P
112	BARON 58TC
3	BARON A56TC
301	BARON G58
197	BEECH DUKE B60
176	CESSNA 340
531	CESSNA 340A
90	CESSNA 402B BUSINESS LINER
140	CESSNA 402C
29	CESSNA 404 TITAN
266	CESSNA 414
363	CESSNA 414A CHANCELLOR
49	CESSNA 421
41	CESSNA 421A
362	CESSNA 421B
610	CESSNA 421C
53	CESSNA T303
116	PIPER 601P AEROSTAR
25	PIPER 602P AEROSTAR
488	PIPER CHIEFTAIN
24	PIPER MOJAVE
835	PIPER NAVAJO
16	ROCKWELL 500 SHRIKE
27	ROCKWELL 500A SHRIKE
82	ROCKWELL 500B SHRIKE
47	ROCKWELL 500S SHRIKE
5	ROCKWELL 500U SHRIKE
16	ROCKWELL 520 COMMANDER
7	ROCKWELL 560 COMMANDER
15	ROCKWELL 560A COMMANDER
13	ROCKWELL 560E COMMANDER
8	ROCKWELL 560F COMMANDER
17	ROCKWELL 680 SUPER
7	ROCKWELL 680E
13	ROCKWELL 680F COMMANDER
17	ROCKWELL 680FL GRAND COMMANDER
8	ROCKWELL 680FLP GRAND LINER

High Performance Move-Up Singles – 5,602

Owners

Count	Aircraft
228	BEECH BONANZA
462	CESSNA 182
59	CESSNA 206
412	CESSNA P210N
21	CESSNA P210R
54	CESSNA T182
1	CESSNA T206
751	CIRRUS SR20
2,905	CIRRUS SR22
241	PIPER MALIBU
468	PIPER MIRAGE

38,967 TOTAL AIRCRAFT

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climb. With insufficient power the wing will quickly enter an accelerated stall.

- If the pilot applies exactly 2G of resistance, the airplane remains level. Airspeed will decrease from the drag of high angle of attack flight, so the pilot will have to add power to maintain airspeed. If airspeed increases, the airplane will climb or the pilot may reduce back pressure – more power means the same G load is sustained at a lower angle of attack. If airspeed decreases, the airplane will descend and its nose will drop below the horizon seeking to attain and maintain the trimmed airspeed.

- If the pilot does not apply at least 2G of resistance with elevator, power or both, the airplane will descend. Its nose will drop below the horizon, seeking to attain and maintain the trimmed airspeed.

Further complicating this situation is the overbanking tendency. Unless the pilot corrects for it, once in a steep turn, the wing will continue to bank further. This means the nose will drop even more. The airplane, now sensing more airspeed than that for which it is trimmed, will naturally pitch *upward* to return to the slower, trimmed speed. Except this pitch change is "up" relative to the airframe, not relative to the horizon. In a steep (and getting steeper) turn, this just tightens the downward spiral, increasing airspeed even more. Airspeed and vertical speed increase incredibly fast. As bank angle and speed increase, G load increases to (and eventually beyond) the airplane's structural limit.

Spirals

Put simply, a spiral is a steep turn that the pilot allows to go bad. Once in a spiral, one of five outcomes results:

1. The pilot recovers from the spiral using the recovery technique described earlier.
2. The airplane spirals rapidly into terrain.
3. The airplane is high enough at the entry into the spiral that it has time to accelerate beyond V_{NE} before it impacts terrain. Exceeding structural load limits causes the airplane to break up in flight.
4. The pilot does not recognize the spiral for what it is, or does not know the proper recovery technique, or panics. She/he pulls back on the controls, perhaps instinctively. The G load builds and overstresses the airframe; the airplane breaks up in flight.
5. The pilot attempts a recovery but does not apply *forward* control pressure to unload the wing. The airplane exceeds structural limits in the pullout and breaks up in flight.

Those sequences may sound familiar. The outcome of attempted visual flight in Instrument Meteorological Conditions ("VFR into IMC") follows one of these patterns. The same goes for a thunderstorm or other strong turbulence encounter, even for an instrument pilot. An airplane's natural spiral tendency helps explain the hazards of the visual portion of an IFR circle-to-land approach, and to landing at a "dark hole" airport at night. In both of these situations, visibility is reduced; the pilot is usually focused on the runway trying to keep it in sight and unusual visual cues tempt the pilot into flying steep banks close to the ground. Frankly, I think more airplanes impact the ground out of spirals entered from uncorrected steep banks in the traffic pattern than they do from stalls.

Training from this Trainer

Let's go back to our example. The SNJ pilot clearly intended to make a right-turning departure; he asked for permission to do so. I interpret a "right hand teardrop turn" from Runway 13 for a departure to the north to mean a tight turn to overfly the airfield, as contrasting from a more conventional left turn on course after departure. An airshow-type, Navy-historical airplane departing from an air show at a Naval Air Station in this "look at me" departure path at least *suggests* the pilot intended to make a fairly steep turn shortly after lifting off, a turn that could quickly degrade into a spiral. It's at least consistent with what I see at air shows all the time.

We don't know yet if there was an engine issue, or the pilot pulled into an accelerated stall, or if there was some sort of control issue, or whether there were medical or other issues that led to the flight path that witnesses described. But whether a spiral was a factor in the SNJ crash or not, hopefully you now know a little more about spirals and how to avoid them. T&T

Thomas P. Turner *is an ATP CFII/MEI, holds a master's Degree in Aviation Safety, and was the 2010 National FAA Safety Team Representative of the Year. Subscribe to Tom's free FLYING LESSONS Weekly e-newsletter at* **www.mastery-flight-training.com**.

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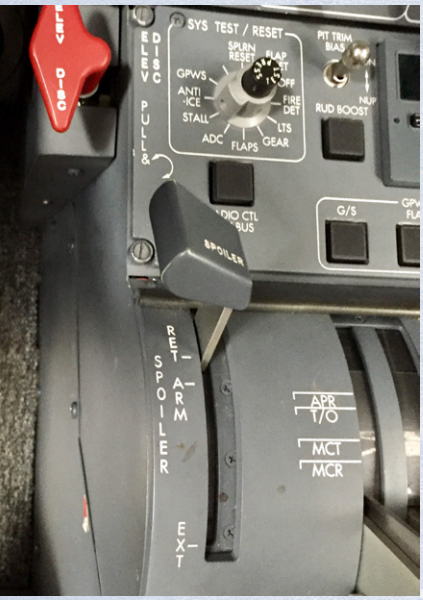
anthony@aeromania.net

The Currency Conundrum

by **Kevin Ware**

It was a hot and dry day near the banks of the Columbia River in Eastern Washington. The lawn sprinklers were creating a distracting fine mist with mini-rainbows as I made an approach to the helicopter's designated grass landing area. I had another pilot onboard and a group of field workers also watching, so I really wanted this set-down to be gradual and smooth. To my satisfaction, that was what happened. But after shutting the machine down and exiting, I was disappointed to see that the right skid was about 5 inches to the left of the yellow line of dry grass located where the helicopter's skid was parked earlier. In a helicopter, putting the skid exactly where you found it without even thinking is an indicator of real competence. And though no one else noticed this small snafu, I thought to myself, *I could be more current.*



Spoiler control on the Lear 40.

A week later, I was pre-flighting the Lear 40 and found the flaps were left down by the crew who flew the previous trip. The flaps are electrically controlled but hydraulically driven, and since pulling them up requires an engine start, I decided to leave them where they were until we were ready to go. When my fellow Lear pilot arrived, I pointed the flap position out and we briefly discussed this small oversight by the previous crew. We noted that we would be extra careful not to commit a similar sin.

So, upon returning that afternoon, we made a smooth landing then proceeded to diligently work our way through every item on the after landing checklist, ensuring we pulled the flaps up. Thinking everything was perfect, we then taxied up to our home FBO smiling smugly. But the smile soon turned to a blush of embarrassment when I opened the door and with a slight grin the line guy said, "Spoilers are out." I looked and sure enough, they were. Now, how the heck did that happen? Simple. The spoiler lever moves by an indent, but only a half-inch exists between armed (ARM) and retracted (RET). When we reached that checklist item, I apparently did not push it quite hard or far enough to do the job. Though no harm was done, I again thought to myself, *I have not flown this airplane for a while. I could be more current.*

A month or so went by, and I was making an ILS approach in a round-dialed Cessna 340 outfitted with Garmin avionics and an older Bendix King autopilot. This combination usually works well, but there are a few steps you have to remember or things can go awry. One step is switching the navigation source on the Garmin control head from GPS to ILS – which I successfully caught. The second step is switching the King autopilot control head from NAV to APCH. About the time that task was due, the controller gave me a clearance and while reading it back, I was a little late in pushing the APCH button. This caused the yellow glide slope needles on the airplane's old round dials to show the airplane was slightly above the glide slope. I caught this gauge indication and (based upon recent flights in turbines with good FMS systems) thought, *the autopilot will probably fix it.*

But as the airplane continued to remain above the glide slope, I remembered in that particular airplane, with that particular avionics and autopilot, it would only capture the glide slope from below, not above.

To fix this, I disconnected the autopilot and manually flew the airplane until the ILS needles were all centered then re-activated the autopilot. Again, no one noticed my snafu, but I certainly did. *I could be more current.*

It Was Not Always This Way

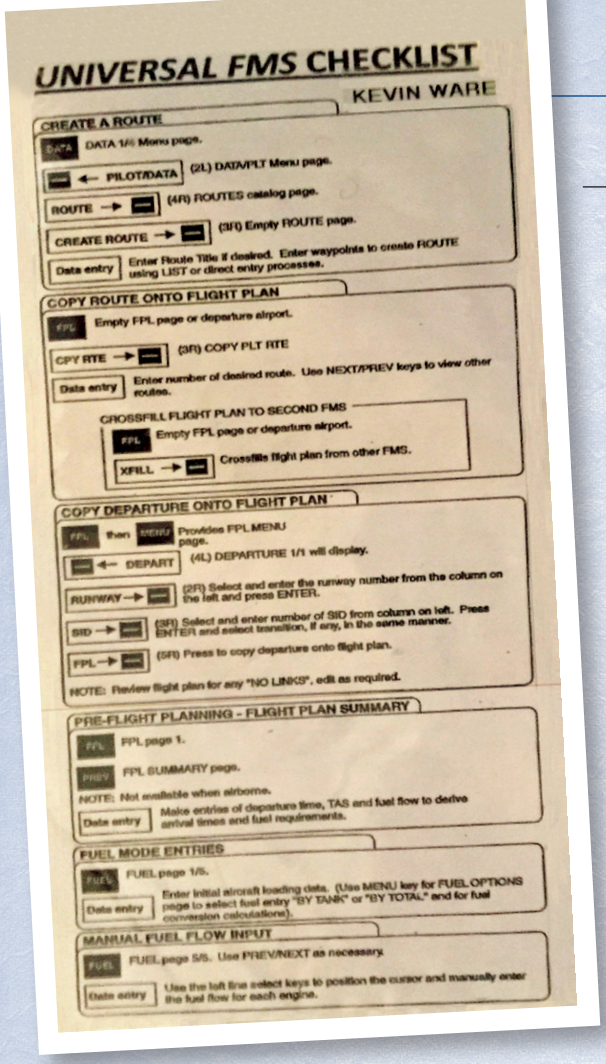
At one point in my professional pilot life, I was flying 80 hours per month and usually in the same aircraft type. After doing that for a couple of years, you realize there is a huge difference in "currency" when comparing that amount of flight time in the same airplane to say 200-300 hours per year in a variety of aircraft… which is what I do now. In the first scenario, you know the airplane, its numbers and any quirks just cold. Plus the button pushing details required to operate the airplane (under almost any condition) also seem to slow down; so much so, that you can get bored waiting for the appropriate time. And even though you still use them, the very long and complicated checklists wind up being completely memorized from the constant repetition.

Understanding the difference between being "current" and "legally current" just makes the issue much more obvious and irritating to pilots who have the "80 hours per month in the same airplane" background; they know what they are missing. And so, I have spent some time thinking about how to alleviate this currency conundrum.

In discussing this issue with other pilots, recurrent training at places such as FlightSafety or SIMCOM almost always comes up. And without a doubt, that kind of training is very helpful particularly for certain types of operation. But I personally have found simulators do not line up exactly with the airplanes I am flying. Plus, regularly taking those training courses in everything from single- and multi-engine piston twins to business jets and helicopters is almost impossible (yet alone prohibitively expensive). I often leave those courses well-versed in the airplane's systems and numbers, but feel far from what I know to be "80 hours per month" current.

One of the things a lack in true currency brings out in me is plain forgetfulness. Jumping in and out of different airplanes all the time, I find it hard to remember certain key numbers such as gear extension speed, maximum operating weight, total fuel capability and average fuel burns. And in what order certain things are to be completed. Of course, in each airplane there is a POH or its equivalent, but those often seem to be awkwardly written and make quick comprehension difficult. To combat this issue, I have found it very helpful to write my own personal checklists for every airplane I fly. I make sure to include the important numbers I have trouble remembering so I can readily refer to them. I also highlight any specific items I overlooked on previous flights. For example, my Lear checklist now has yellow highlighting over the "spoilers" line on the after landing checklist.

I probably have two dozen of these checklists by now, all well-worn. The pilots I regularly fly with even give me a knowing nod when I haul them out. In the case I am flying with another pilot, I will also usually announce (when true) that I have not flown the airplane for some time, and tell him or her to "watch out" for me. Although this almost always results in a slight laugh and response to the effect of, "Yeah sure, you'll be just fine," it still sets a certain tone for our subsequent interaction. I definitely believe it contributes to the safety of the flight.



It can be helpful to create personal checklists for varying aircraft types and avionics systems.

But if flying an airplane that does not require another pilot, I pay particular attention to briefing myself. I'll typically read through both sides of the checklist a couple of times before even starting the airplane. If my checklist shows any yellow highlighting, rest assured I look extra carefully at those items. When solo, I also limit the type of weather and airport I am willing to operate in if I do not feel truly "current" in that particular airplane. For example, my own Cessna 340 has RAM VII engines, a Robertson STOL kit and VGs. When light, it thinks it can climb trees. But if I have not flown it in say 20 or 30 hours in the previous month, regardless of what the airplane thinks it can do, "tree climbing" is out of the question.

In terms of basic aircraft control, I find the effort required to become "80 hours per month" current varies with the amount of time I have already accumulated in that airplane. For example, in an airplane that I have 2,000 hours in, everything comes back pretty quickly. Whereas, in airplane I have 200 hours in, it is going to require a lot more time. I say this with exception of certain basics of piloting such as judging the angular distance from the ground required to make a safe landing. Typically, landings are one of the currency issues I least worry about. Sort of like the proverbial "like riding a bike" analogy.

Today, another factor making currency more difficult is the plethora of different and vastly more capable avionics and FMS systems. Three decades ago, in the era of VORs, vacuum pumps and round dials, everything was pretty straightforward and simple to stay on top of. Now, there are usually four or five computer screens, each powered by separate electrical systems and each receiving information from different input sources. Not to mention, they require an often-confusing array of key strokes to operate properly. Staying on top of how all of the different equipment works (especially when flying a variety of aircraft) is a major problem for anyone.

For example, there are considerable differences in how to operate the Universal FMS found in a newer Lear, as opposed to a Rockwell Collins Proline unit found in a CJ or newer King Air. The Collins unit requires typing commands into what is called the "scratch pad" (abbreviated SCP), then moving it to the appropriate function line. Whereas, the Universal set-up does not make use of a so-called scratch pad at all. Pilots just enter the information directly into the appropriate function line. This is an issue even with the older Garmin units in smaller aircraft. The Garmin GNS 430 and 530 models operate completely different than a 480 (which actually has a functional logic more akin to an FMS in a larger airplane). There are of course manuals for all of this equipment, but they are usually bound in a 2-inch thick book. Though greatly informative, they're absolutely useless if wanting to find directions on how to do something quickly. To deal with this particular problem, I made myself one-page instruction sheets for the most common operations for each of the avionics or FMS systems I am likely to encounter. Those sheets have proved to be a big help.

They say you only miss the things you know about. Well, I definitely miss the type of comfortable currency that comes naturally when flying 80 hours per month in the same aircraft. But on the other hand, I do not miss being away two weeks every month, and the sense of boredom that can occur when constantly flying the same airplane along the same routes. If you are careful with your limitations, use personal checklists and instruction sheets to compensate for your foibles, you can still be a very competent and safe pilot – even when flying just 200 hours per year. There are solutions to the "currency conundrum." 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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by **Kevin R. Dingman**

Sunday Drivers

When others won't play by our rules: radio, runway and ramp rage.

*[**Sunday Driver** – one who drives slowly, infrequently and in an inexperienced or unskillful way – like one who is out for a leisurely Sunday drive.]*

After qualifying for a concealed pistol license (CPL), I purchased a legal plan and liability policy designed for civilians. If there's an incident, I'm to first dial 9-1-1 to summon medical help (for the fool that attacked me) and law enforcement (to gather evidence to keep me out of jail). This is followed by a call to the legal plan team. A local participating attorney will then swiftly be dispatched to advise and assist with the "keep me out of jail" part.

Clients of legal plans like mine also receive e-mails about nationwide concealed weapon laws and the avoidance or application of deadly force. Recently, a mailer was sent to me describing ways to avoid road rage and methods to deescalate the situation before it reaches critical mass. How they knew that I've become a crotchety driver is a privacy conundrum. I suspect the monitoring and reporting system in the Jeep sent them a video of my latest Dennis Miller inspired road-rant.

At times, we've all felt our patience decline and bad manners swell while driving – and not just on Sundays. While disappointing, we should not be surprised the behavioral norms of today's drivers cascades into our utopian world of airplanes in the form of radio, runway and ramp rage.

Coefficient of Cantankerousness

In the days of King Arthur and Merlin, the solution to anger and frustration was simple: challenge the offending moron to a sword duel. The one left standing got the other's horse, house, wife, dog, cat and cow. In the late 18th century, pistols became the weapon of choice. Though not as expeditious or final, in today's civilized era we use less psychotic methods to deal with anger and resolve conflicts: hand gestures, shopping carts and automobiles. Road rage can include rude gestures, verbal insults or aggressive driving styles. It is engaged in order to release said anger and frustration. However, when pilots feel frustration regarding interactions with support personnel, radio transmissions (or lack thereof) or piloting styles, we do not have the luxury of an attorney or duel to calm the reactionary, gamma ray-infused Dr. David Banner inside of us. Nor may we pull into a Barnes & Noble, Starbucks or yoga studio to regain our pilot-y calm. We must get over it by lowering our coefficient of cantankerousness and move on quickly so as to remain focused on more critical decisions and actions.

In the Part 121 world, it's easy to get wound up. Not only due to weather, fuel, schedule, maintenance and safety concerns, but also rude passengers, stressed gate agents, tired baggage handlers and cranky flight attendants. The same applies for those folks dealing with all of the above plus an ornery captain. But especially frustrating can be the period of time from airport arrival to our taxi from the gate or FBO. That is when we deal with non-pilots unfamiliar with our bazillion acronyms, pilotisms and operational concerns. And you know how volatile a mix that can be if we are trying to beat the weather and/or get back home. But challenging the desk clerk or line boy with a glove across the face will not provide a satisfying duel or quicker movement down the runway (probably slower in fact). Once we begin the "before starting engines" checklist, compartmentalization must take over and any unresolved frustrations put into a box to be dealt with later, if at all. Because after the engines are running, the next challenge begins as we throw our call sign into the "ready to taxi" bullring – ole'!

Cool Your Jets

It grinds me when I call ground: "so and so ground, this is so and so, taxi from Signature with information Delta." "Roger, so and so. Taxi to Runway 35 intersection Romeo two, via Bravo, Foxtrot and Golf. Cleared to cross 22 on Bravo – information Delta is current, advise when you have Delta." Major Tom to ground control, didn't I just tell you that I have Delta!

And it's getting more and more common to hear a controller admonish a pilot or crew by saying, "Alright guys, you need to listen up. This is the third call and I'm busy here." But when ATC fails to respond to us: "I have multiple frequencies here" or "Sorry, I was on the land line" or "Sorry, I was offline." Pilots missing one or two calls directed at their call sign is a daily occurrence and having been one of the non-responsive pilots myself, I know that the reasons for missing a call are numerous and not necessarily nefarious. They can include: distractions from passengers or cabin crew, avionics volumes, radio selection, oxygen mask mismanagement, frequency errors or momentarily forgetting your call sign – just to name a few. But how about this for a punch in the gut. Having heard a similar call sign and thinking that perhaps they had missed a call, a pilot asked ATC if they had tried to call them. From the pilot: "Center, did you call 1324 Foxtrot?" ATC's response: "Negative. We'll use your call sign if we're trying to call you, two four Foxtrot." Ouch.

Perhaps the bottom line is this: controllers have a busy job just like us and we are mostly unaware of the moment-to-moment distractions, phone calls, handoffs, weather advisories and decision-making that they endure. Both sides of the radio conversation need to pay close attention, put away the red bullfighting capes and cool their jets.

Lead, Follow or Get Out of the Way

Once we fumble and fight our way off the ramp and out to the runway, it seems that the grocery store checkout line, fast food line, oil change line or bank drive through line "bad choice" axiom has followed us to the airport. No matter the line we are in, there always seems to be an idiot or two (or three or four or five) in front of us. The line for takeoff moves just fine until we are number two and then the number one plane is suddenly not answering the radio. There is no way to get around them to another taxiway or runway intersection. *Come on man, this is costing me $10/minute just sitting here waiting. I'm going to miss "Last Man Standing" if we don't get a move on.*

Sometimes a pilot will discover an aircraft systems issue and need to hop out of line and go back to the gate or FBO; that is expected. But forgetting (or one of the other many reasons we miss a radio call) to switch to tower and then still not recognizing it when the folks in front of you are taking off without a clearance (because you are not on tower frequency to hear the clearance) is a rookie faux pas. Fortunately, tower has seen this happen a million times so they will dispatch a truffle hog to root through all the frequencies until the missing plane is sniffed out and directed to tower frequency. "Tower, we're up your frequency now. Did we miss anything?" *Of course you did – where's my sword.*

And here's one from our side of the radio-rage coin. It was oh-dark-thirty in Denver and we were the only airplane on any frequency. Approaching the hold short line, we switched to tower and checked in ready for takeoff. Tower said, "Ground wants to talk to you." We switched back to ground only to have him tell us that he hadn't sent us to tower yet. Next he said, "Okay. Now you can go to tower." Really?

Maintain an Even Strain

> *Courtesy is as much a mark of a gentleman as courage.*
>
> – Theodore Roosevelt

Having survived a number of abnormal inflight situations, most of us realize that another one is likely within the next 50 or 60 logbook pages. The severity of an issue can range from a blown fuse to a blown motor, but it's a statistical eventuality in all flavors of aircraft and experience levels that stuff happens. Most of the time we are able to dodge or deal with obstacles like a slalom skier as we manage aviation and life frustrations. But daily interactions with bad drivers, millennial store clerks and robo-help lines can sometimes screw us into the ceiling and that's not a good mental state for aviating. Thomas Jefferson said, "Whenever you do a thing, act as if all the world were watching."

It is easy to say or do something you'll regret later. Instead take a breather, identify possible solutions and use humor to release tension. Most of all, be courteous. We certainly don't want the monitoring magic in our airplane to witness a rant and post it to the world. And unless you really need another horse, house, spouse, dog, cat or cow, don't allow the face-slap with a glove thing to cascade into our utopian world of airplanes. T&T

Kevin Dingman *can be reached at* **dinger10d@gmail.com**.

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To Stop or Not To Stop

The following recent, fairly long trip in the Mustang nicely illustrates just how many different factors come into play when flight planning.

A group of Citation owners including myself were invited to the Steven F. Udvar-Hazy Center at Dulles (KIAD) for tours and meetings. To top it off, we would walk alongside the space shuttle Discovery with former astronaut Charlie Precourt as he conducted a preflight inspection of the vehicle on prominent display at the museum. (The same preflight he gave the vehicle when he commanded it on missions to the International Space Station!)

My flight to Dulles would be pretty close to the Mustang's published range. As planned, 1,022 nm. Forecast winds were a 44-knot push and temperatures at FL410 all ISA minus. Both important numbers for a max range trip. We would arrive after 3+04 with almost 1,000 pounds in reserve. The Mustang could do the trip if the weather was decent and if we did not descend too early on the arrival. But what if D.C. shut down for some unusual event?

I began to plan a midpoint stop in Nashville.

The night before departure, a low-pressure system parked itself right over our route with low ceilings and rain covering much of our path in and out of Tennessee. The weather at Dulles? Clear and perfect. It made more sense to try the non-stop and land short of the destination if necessary. So, I had the fine folks at Addison Million Air fill the tanks to the very top, giving me 2,700 pounds instead of the normal 2,580.

Once airborne, however, the winds were not living up to forecast. Instead of an initial 35-knot push, I had 10. But the great Garmin G1000 weather depiction page showed increasing tail winds east of Nashville.

We pressed on.

Temperatures aloft went from ISA-2 to ISA+5 as we topped the low-pressure center. Slowly, tailwinds began to increase. Dulles weather stayed clear. The predicted fuel on arrival numbers indicated 850 pounds. If I didn't get vectored too far off the arrival, all would be fine.

"November Four One Six Delta Mike, I have an amendment to your routing," came the call from Indy Center. "You are now cleared direct Hotel Victor Quebec (HVQ) and the Gibbs two arrival into Dulles." That reduced the landing fuel another 50 pounds. Everything was still okay. "Center, be advised that Six Delta Mike will be unable to reach the 280 knot speeds on the arrival. We are limited to 250 knots," I replied.

About five minutes later, "Six Delta Mike, I have an amendment to your routing. You are now cleared direct to DOCCS intersection and the DOCCS 2 arrival." More button pushing. Predicted fuel reserves were still good.

The ATIS was calling for a landing to the north and with Dulles' three runways, it was unlikely that I would be unable to land. Tailwinds increased to 60 knots and Indy Center was accommodating on the descent as well. After 3+18 (due to the re-route), we exited Runway 1R with 900 pounds remaining.

As it was, we were the last airplane to arrive at the gathering. But on this day, the little Mustang was all I needed.

Fly safe. T&T

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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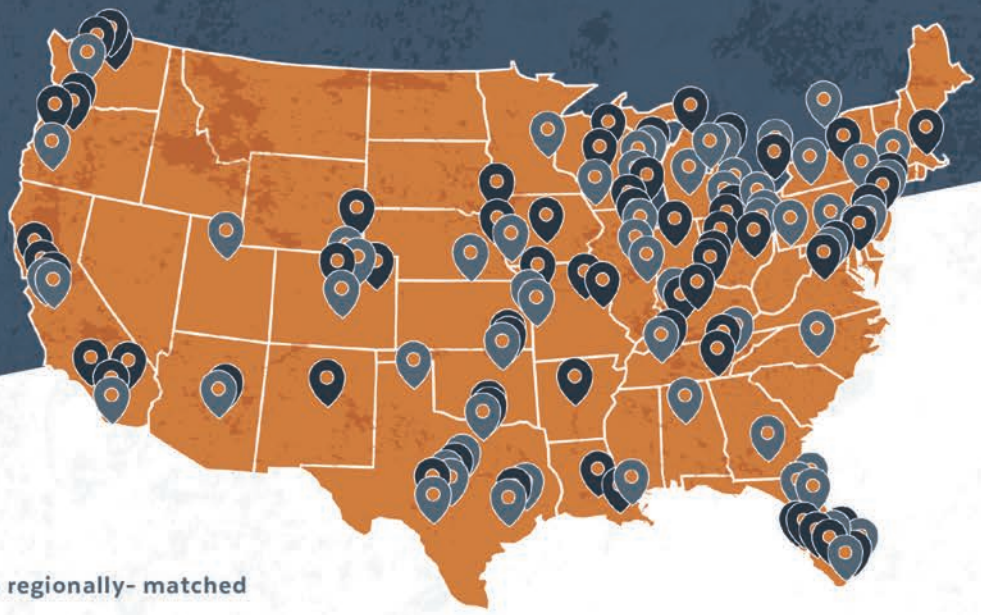

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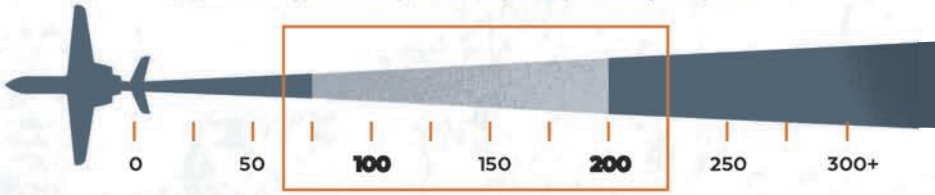

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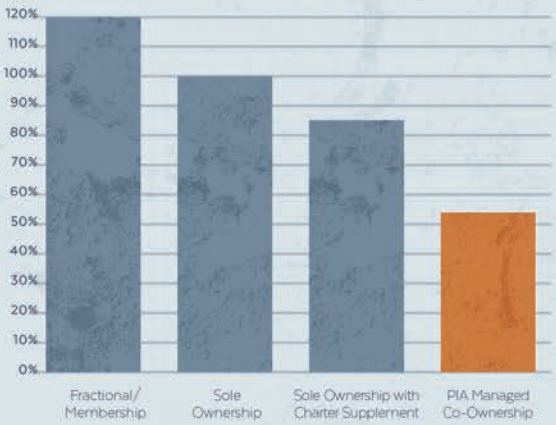

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