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## Upset Training

Patty Wagstaff: From  
Skeptic to Convert

Shifting Focus on  
Upset Prevention

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Flight: Blackhawk  
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*Twin & Turbine* (ISSN 1945-6514), USPS 24432 is published monthly by Village Press, Inc. with advertising offices located at 2779 Aero Park Drive, Traverse City, Michigan 49686. Telephone (231) 946-3712. Printed in the United States of America. All rights reserved. Copyright 2016, Village Press, Inc. Periodical Postage Paid at Traverse City, MI.

**SUBSCRIPTIONS:** *Twin & Turbine* is distributed at no charge to all registered owners of cabin-class aircraft. The mailing list is updated monthly. All others may subscribe by writing to: *Twin & Turbine*, P.O. Box 968, Traverse City, MI 49685, or by calling 1-800-447-7367. Rates for the United States and its possessions follow: one year \$29.95; two years \$52.50. Canadian subscriptions are \$15 per year additional, including GST tax. Overseas subscriptions are \$30 per year additional, U.S. funds. Single copies \$3.95.

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**POSTMASTER:** Send address changes and inquiries to *Twin & Turbine*, Village Press, Inc., P.O. Box 968, Traverse City, MI 49685.

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Aerobatic Champion Patty Wagstaff  
Photo Courtesy of Mike Shore

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# Editor's Briefing

by Rebecca Groom Jacobs



## Why an Extra?

**W**ell, I broke the rules. I did not feature a twin or turbine on the cover...but it got your attention, right? That was my goal, as this issue focuses on an important topic: upset recovery training.

Upset training has popped up with increasing regularity over the last few years as the FAA, owner-pilot groups and general aviation (GA) organizations have turned a collective focus toward minimizing incidents related to loss of control inflight (LOC-I). Loss of control can occur when an aircraft enters a configuration outside its normal flight envelope, which can quickly develop into a stall or spin. It is the leading cause of GA accidents.

To help shed light on the matter, we reached out to renowned aerobatic pilot Patty Wagstaff. Since 2013, Patty has been an active instructor at her flight school Patty Wagstaff Aerobatic School in St. Augustine, Florida, which offers both aerobatic courses and upset prevention and recovery training (UPRT). In addition to stall training, UPRT is a training element aimed at reducing loss of control events, but ultimately preparing pilots for a successful recovery if they do occur. The FAA labels an effective UPRT course as the following:

*An effective UPRT curriculum provides pilots with the knowledge and skills to prevent an upset, or if not prevented, to recover from an upset. Training should focus on preventing upsets rather than waiting to recover from one. The focus on prevention is a significant shift from previous upset or unusual attitude training, which primarily focused on recovering from a fully developed upset. Prevention training prepares pilots to avoid incidents, while recovery training intends to avoid an accident if an upset occurs.*

Initially a skeptic, Patty shares in her article how her personal view of upset training, and the industry's attention on the matter, has evolved in recent years. She and fellow UPRT instructor and retired fighter pilot Jeff Rochelle offer valuable insights and advice from their years of experience instructing in the GA community. (Also keeping with the upset recovery theme this issue is Dianne's "Position Report" as well as "Fly It Like a Fighter").

Several owner-pilot associations have developed safety programs that encourage participation in UPRT courses. The Malibu/M-Class Owner Pilots Association (MMOPA), led by our own Dianne White, has rolled out the Master Aviator

program that focuses on the three key areas that lead to accidents in the PA46 community: loss of control, skill deficits in directional control and lack of proficiency due to infrequent or irregular flying schedules.

"We created a program that asks our members to train intentionally to address those areas while adding a spirit of competition. If they meet all the requirements, which includes 100 hours of flying per year and upset training, they will be awarded the MMOPA Master Aviator wings," said White. "Member participation has been fantastic, and the hope is that our members will be safer and better prepared pilots."

Another type-specific group, the Citation Jet Pilots Association (CJP), has developed the Gold Standard Safety Award program, which recognizes Citation pilots who go above and beyond minimum Citation currency requirements such as completing a second 61.58 check at a Part 142 simulator training provider, adding a rating or undergoing upset recovery training. Charlie Precourt, former NASA astronaut

and chairman of the CJP Safety Committee, believes UPRT should be mandatory for all pilots early in their pilot training.

"The ability to recognize an upset scenario and respond with the correct recovery is crucial. I've seen some students in this training complete 'split S' high speed dives trying to recover from inverted attitudes when a simple roll to upright was all that was required," said Precourt. "Once this learning is gained, the confidence it gives to handle virtually any upset is a huge plus to safety. The 'how' is exposure to the range of upset scenarios, such as nose high, nose low, high speed and low speed - with an easily learned set of responses. The 'why' is no other method can teach the proper reflexes and 'first move' to make in an upset situation."

While the efforts of these organizations and others are nothing short of encouraging, it is ultimately up to you, the pilot, to maintain and improve the necessary skills for safe flying. I hope the information you read in this issue of Twin & Turbine either reaffirms your current efforts, or inspires you to take your training to the next level. After all, practice makes perfect. And if we're going to seek perfection, let it be when it matters most. 

**The focus on prevention is a significant shift from previous upset or unusual attitude training, which primarily focused on recovering from a fully developed upset.**

A handwritten signature in black ink that reads "Rebecca Groom Jacobs".

# Airmail

## In Response to David Miller's "My Father's Son" (April)

I trust this message finds you and Patty well. I just read the above captioned article. Thank you. I mentioned to you once how strikingly similar some aspects of our aviation careers have been. I realized this morning there's another similarity.

I have attached for you a picture of my dad ("Captain Nick" as the grandkids call him) in the early 1950s. When asked one day what size shorts he wore, he replied that he wore a 34, but a 36 felt so good he just went ahead and bought a 38. I could go on. Aivey and I send our best.

David A. Street

I am a lifelong private pilot still flying a JetProp at 77 and someone who loves good humor. So, I write to confirm to you that as someone who always is tempted to read your T&T column first, I thank you for your latest story. You should know that the cliché "LOL" rang true as I read your touching and very funny story about your father. I only wish I could have known him. A great story and a wonderful legacy. Thank you for sharing!

Bud Risser

## In Response to Kevin Ware's "Small Mistakes" (April)

Your and David Miller's columns are the main reasons I enjoy my monthly issue of Twin & Turbine. I especially enjoyed yours this month as I frequently find myself doing much of the same analysis after a flight.

Since you appear interested in experiencing and writing about many areas of aviation, I would like to invite you to join us for the Veterans Flight 2019 Pensacola Beach Air Show. We're rapidly running out of World War II veterans, so we're making a major effort this year to locate and reach out to veterans who live outside our local area and any help you could give us will be greatly appreciated. There are some great stories about veterans who have flown with us, and there will be more on our website in the near future - [veteransflight.org](http://veteransflight.org).

Roy Kinsey Jr.

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# Position Report

by Dianne White



## Normalizing Upset Recovery Training



Not that many years ago, most general aviation pilots were taught to fly using tailwheel airplanes before tricycle-gear aircraft, with their inherently more stable characteristics. My mother learned to fly nearly 60 years ago in an Aeronca Champ with no electrical system, something that was very common at airfields across the country. Flying that little bird, she learned proper rudder use, good crosswind technique and appropriate energy management. She also learned to precisely enter and exit spins and could slip the Champ (which had no flaps) to lose altitude, control speed and put the plane on the numbers. Coordinated flight was second-nature, unless you put uncoordinated flight to intentional use.

“You had to pay a little more attention to detail,” she told me recently when asked to compare flying tailwheel and tri-gear planes. “It makes you sharper on takeoffs and landings, and I believe those skills led to a better understanding of the skid or slip and how to avoid a stall-spin scenario.”

In the generations after, most of the rest of us learned to fly in the ubiquitous Cessna 150/172 or trainers produced by Piper or Beechcraft. While the same skills were taught to us, the skill transfer wasn't quite the same. The loss of control accident is still a major cause of GA fatal accidents and ground incidents (overruns, runway excursions, gear collapses, etc.) still plague

us. We have amazing technology in the cockpit, autopilots that offer envelope protection and a “blue button,” and an array of situational awareness and weather tools at our fingertips. Many instructors lament that today's pilots, especially those who quickly progress to heavier, faster, more capable business aircraft, could benefit from learning or re-learning some of the basic, core skills that can help keep the shiny side up.

Last year, the Malibu M-Class Owners & Pilots Association (MMOPA), the organization I represent as the executive director, resolved to do something about it. The MMOPA safety committee, consisting of some of the top instructors and thought-leaders in the PA46 community, decided to make a positive difference with the creation of a whole new safety program to address the issues that directly contribute to accidents in PA46s, although these issues are shared by most twin and turbine aircraft. The committee's analysis of accidents concluded they fall in two broad categories: 1) stall/spin accident, which is almost always fatal; and 2) ground accident, which is rarely fatal but always costly.

The instructors on the committee concluded that pilots generally have poor footwork on takeoff and landing, don't really understand the stall/spin accident and don't receive consistently good training. They concluded it's time to fix this with a safety initiative that became the Master Aviator Program, which was introduced to the membership at the MMOPA Convention last fall. The program combines a series of advancements in proficiency, skill and training with the spirit of competition within the community.

There are three levels that members must progress through: Aviator, Senior Aviator and Master Aviator. The requirements of the highest level, the Master Aviator are:

- Log at least 300 hours in type;
- Fly a minimum of 100 hours a year;
- Do a supplemental mid-year training event in addition to their annual recurrent;
- Complete upset training and/or spin awareness course;
- Attain a tailwheel endorsement;
- Be accident-free for the three previous years;
- Commit to attending the MMOPA Convention, which is heavy on safety content.

At the MMOPA Convention held last month, the MMOPA's safety committee recognized the first class of Master Aviators, who received a custom-designed “wings” pin that they can

proudly wear on their lapel. MMOPA believes that the accident record of those wearing the Master Aviator wings will be far better than those that don't. Is that a bold statement considering the program is in its early stages? Probably, but we are already seeing a renewed commitment to safety, training and proficiency among our members.

Further emphasizing the importance of spin awareness, upset training and stick-and-rudder skills, at the convention MMOPA offered one-hour introductory upset training sessions with Patty Wagstaff Aviation Safety. The training slots, which were offered over the course of four days, quickly filled up many weeks in advance of the convention.

MMOPA certainly isn't the only owner-pilots association to place attention on the value of upset training and spin awareness. However, it is focused efforts like this that pair tangible goals with a unique reward system that may motivate more pilots to strive to improve their skills in this area.

And just perhaps this type of training will grow to be considered as mainstream and essential as tailwheel training was nearly a half-century ago. **T&T**

**Dianne White** is the executive director of MMOPA and editor of MMOPA Magazine. For a total of 14 years, she was editor of *Twin & Turbine* and has worked in the business aviation industry for nearly 30 years. She also serves on the board of directors for Angel Flight Central. An active multi-engine, instrument-rated pilot, Dianne lives in the Kansas City area and can be reached at [editor@diannewhite.com](mailto:editor@diannewhite.com).

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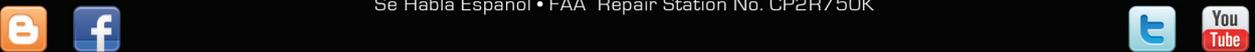
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# Great Getaways: Beaufort, North Carolina

by Grant Boyd



PHOTOS COURTESY OF RICHARD SHAPIRO & ROBERT COLES



Located in the southern Outer Banks region of North Carolina, Beaufort is a quaint coastal town with around 4,000 residents and storied 310-year history. Originally called “Fishtown,” the town is the third oldest in the state, established in 1709 and incorporated in 1723.

Today, visitors enjoy historical sites, fishing and quiet beaches. Southern Living recently named Beaufort the 2019 “South’s Best Small Town” and Travel + Leisure called it “America’s Favorite Town” in 2017.

## Activities and Amenities

An integral aspect of Beaufort is its history. During its first settlement in the 1600s, the town’s visitors built a variety of Bahamian and West-Indian styled homes and buildings, many of which still stand today. The local Beaufort Historic Site exists to teach visitors and residents alike about the town’s rich history and offers several tours.

One of which is the “Historic Buildings” tour, which encompasses a variety of building styles from a circa 1778 cottage to a mid-1800s doctor’s office, to a mansion built in 1825. The Historic Site also offers a tour from atop a double-decker bus, one that “tells tales of Beaufort’s rich past of pirates, star-crossed lovers and Confederate spies.”

With its prime location on the Atlantic Ocean, the town is an important port that played an integral role during many of America’s conflicts including the Revolutionary War, the War of 1812, the Civil War and even World War II. The waters near Beaufort house one of the few German U-Boats sunk in the American Theater of the Second World War. The Nazi submarine’s identifier, *U-352*, was sunk in 1942 by the United States Coast Guard’s cutter, *Icarus*, and was ultimately discovered by a scuba diver in 1975.

This shipwreck, along with several others (including one of legendary pirate Blackbeard’s), can be found off the coast and make the waters an extremely popular destination for scuba divers. The various dive centers in and around Beaufort take advantage of these aground naval supplements in addition to the already-appealing dive conditions.

As during its origins, Beaufort’s fishing industry remains an important component of its local economy, with excellent inshore and offshore angling opportunities. Offshore fishing is especially popular, with many charter operations based along the town’s boardwalk. These companies offer trips that take anglers miles from shore where they have the highest likelihood of catching some of the trophy fish such as

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blue marlins or albacore. The waters are so attractive for these billfish that the Big Rock Blue Marlin Tournament has been hosted in the area for more than 60 years. The popular tournament, with a prize purse of more than \$1 million, has been quoted by some as the “Super Bowl of Fishing.”

For those more apt to stay on land, the town boasts several acclaimed restaurants, several of which overlook the ocean. The eateries, ranging in price and formality, offer an array of “water to table” bites, with dishes including seafood often caught in the water just feet from the restaurant.

Also along the sea, the area’s sandy beaches are pristine and quiet, representative of the small town itself. One example of a picture-perfect, undeveloped beach is that which surrounds the Cape Lookout Lighthouse – reached by a short ferry ride from the mainland. The 163-foot lighthouse is open to climbers from mid-May to mid-September and boasts amazing views of the open ocean and the South Core Banks (island it sits upon).

Back on the mainland, there are numerous lodging options from Airbnb bungalows, to vacation home rentals, to standard hotel rooms. Aside from all the above activities, downtown Beaufort houses several shops, galleries, museums and eateries. Dr. Robert Coles, a local who flies an MU-2, says that the town is a “great destination for the weekend, a week, or even longer.”

### Flying into Beaufort

For pilots considering a visit to this great getaway, Michael J. Smith Field Airport (MRH) is located just one mile north of the town.



“MRH is an uncontrolled field that is easy to fly in and out of,” said Coles. “A big plus is it never has much of a crosswind due to its three runways.”

Each runway is at least 4,000 feet and offers an RNAV (GPS) approach, enabling just about any twin or turbine owner to make the field their landing spot of choice.

The field has one FBO, Crystal Coast Aviation, which has 100LL, Jet-A, tie-downs, rental cars and hangars. Additionally, the FBO offers scenic flight tour packages for those who want to better experience the area’s beauty from the air in a lower and slower fashion than their aircraft may allow. However you decide to spend your time in Beaufort, it will be a trip to remember. **T&T**

**Grant Boyd** is a recent MBA graduate of Wichita State University. A private pilot, Boyd is currently working toward his instrument rating, with the ultimate goal of combining his love of business and aviation with a career at a general aviation manufacturer. You can contact Grant at [grantboyd2015@gmail.com](mailto:grantboyd2015@gmail.com).

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# Flying Blackhawk's XP67A Engine Upgrade

by Joe Casey



PHOTO COURTESY OF BLACKHAWK

I consider myself a lucky pilot in that I get to fly just about every King Air type. I currently have a B100 and 300 under management and fly both more than 100 hours per year. I also regularly fly the King Air 90, 200 and 300/350 series either in training or ferry flights. Often, I am asked, "Which King Air is your favorite?" And every time, there is no doubt in my mind as to the answer – the King Air 300/350.

It's powerful, hauls an impressive load, is a proven design, offers a high cabin max differential and boasts tremendous dispatch reliability. The 300/350 is the pinnacle of the King Air lineup and it's hard to fathom anything improving upon the current design. But earlier this year, I received the nod to put Blackhawk's latest XP67A engine upgrade to a flight test and I jumped at the opportunity.

## Trip to Waco

The timing for this Blackhawk visit was perfect for many reasons, but the biggest one was that the owner of the King Air 300 that I manage is considering an upgrade to either a "stock" 350 or a 350 with the Blackhawk conversion. So, the King Air 300 owner (Ron), myself and two local pilots (Ben and Deanna) loaded up in Ron's 300 at my home air-

port (KJSO) and flew the relatively short 100 nm flight to Waco Regional Airport (KACT). Waco Regional is an active airport with a good mix of airline and general aviation traffic and is the home to Blackhawk Aerospace (previously Blackhawk Modifications) – a recognized producer of performance improvements for turboprop aircraft.

Let me preface this by saying that the King Air 300 we fly is no slouch when it comes to performance. On this cloudy, nearly-ISA (but rainy) day, our King Air 300, powered by the PT6-60A engines, climbed out at 2,400 fpm up to our cruise altitude of 12,000 MSL. While that climb rate is impressive, I would later see an even better one.

The clouds did not break the entire way to Waco, and we needed the ILS approach to RWY 19 to get in. Upon arrival, we met Chris Dunkin, chief pilot for Blackhawk Aerospace, and soon saw our test airplane for the day – N188RU. The airplane is a gorgeous 2014 King Air 350 that was recently upgraded with Blackhawk's XP67A (Pratt & Whitney Canada PT6A-67A) engines. Chris gave us a brief "differences" discussion and walk-around/preflight. Soon, I was stepping through the impressive interior to the cockpit.

## Upgraded 350

Very little is different in the cockpit with the XP67A conversion, so I felt right at home in short order. The main dissimilarity was the time required to start the big engines. The Ng spools up slower and the ITT rises at a more leisurely fashion in the XP67A compared to a "stock 300/350," therefore the start time takes a bit longer.

As we taxied out to the runway, we obtained an IFR clearance since the weather remained solid IFR. Not only did ATC give us the clearance, but they also gave us an unobstructed climb to FL330. They knew we were flying a "capabilities demonstration flight" and Chris was able to negotiate the nearly unheard of climb clearance all the way up to the flight levels. It was exactly what I wanted to give the XP67A upgrade a thorough checkout.

The takeoff roll and initial climb rate were similar to the stock King Air 300, but soon the power of the XP67A began to show itself. We climbed at 160 KIAS, with the climb rate soon increasing to 3,100 fpm passing through 10,000 ft MSL. The mighty Blackhawk 350 was then able to hold a 2,700 fpm climb rate through FL180, followed by 2,400 fpm through FL250, then slowly decreased

to 1,400 fpm as we leveled off at FL330. For contrast, I regularly see 2,400 fpm at the lower single-digit altitudes in a stock 300, but it would normally climb at only 1,000 fpm just before level-off at FL280. The XP67A produces more power at a higher altitude than a stock King Air 300/350.



Blackhawk Chief Pilot Chris Dunkin (left) briefs Joe Casey prior to the XP67A test flight.

To contrast the performance more closely, the XP67A breathes better than the PT6-60A. The 60A “temped out” (became temperature limited) at 16,000 MSL on the flight home this day, while the XP67A “temped out” at FL240. This is the core reason the -67A achieves better performance; it simply breathes better at high altitude. At lower altitudes, the Blackhawk 350 out climbed the stock 300 by only 500-600 fpm, but once in the “20s,” the Blackhawk 350 out climbed the stock 300 by nearly 1,000 fpm. And at FL280, the Blackhawk 350 was climbing strong while the stock 300 was losing its “umpf” quickly. Down low, the Blackhawk conversion offers somewhat better performance, but up high, it’s a significant improvement.

At level-off, that incredible climb rate was converted to forward airspeed. We saw 328 KTAS at FL330, which is best described as “jet-like.” There were five of us onboard, so there was plenty of room for everyone in the back of the King Air,

and they were able to hold headset-free conversations in the super quiet cabin, courtesy of the five-blade props.

The descent back to Waco Regional was typical of any King Air, meaning we were able to pull back the power and descend rapidly. Easily holding 4,000 fpm for much of the descent, we were soon vectored for the ILS to RWY 19. Landing the XP67A-powered 350 was routine, and soon I was pulling back up to the hangar at Blackhawk Aerospace.

### Upgraded 300

Just when I thought the fun was over, Chris notified me that there was another flight potential; Blackhawk also had an early model King Air 300 with the XP67A conversion. I was eager to see how much the XP67A would enhance the performance of the 300. This particular airplane was still being used for testing and was super light. All of the interior amenities (including the seats) were removed and specialized equipment was added for monitoring performance. So, with only two people onboard, a greatly reduced empty weight, and the biggest engines ever mounted on a King Air, we were going to fly a true rocket ship.

Following a similar template of our first flight, we received another unobstructed climb to FL330. I rotated off the runway, pitched up to 20 degrees nose-high and let the horses run. It took us a grand total of 15 minutes to reach FL330 in the Blackhawk 300. That’s an incredible rate of climb. And for all of the naysayers, I get it – performance like this cannot be expected on a King Air that is properly appointed with an executive interior, full fuel and full seats. But, it does show what a true hotrod the King Air is if operated lightly. Of course, all of the excess rate of climb is turned directly into true airspeed once the level-off occurs, and we saw 338 KTAS as our top speed this day. Again, we descended quickly and soon I flew the ILS 19 again. The total trip up to cruising flight at FL330 and back was a mere 35 minutes.

### Weighing the Options

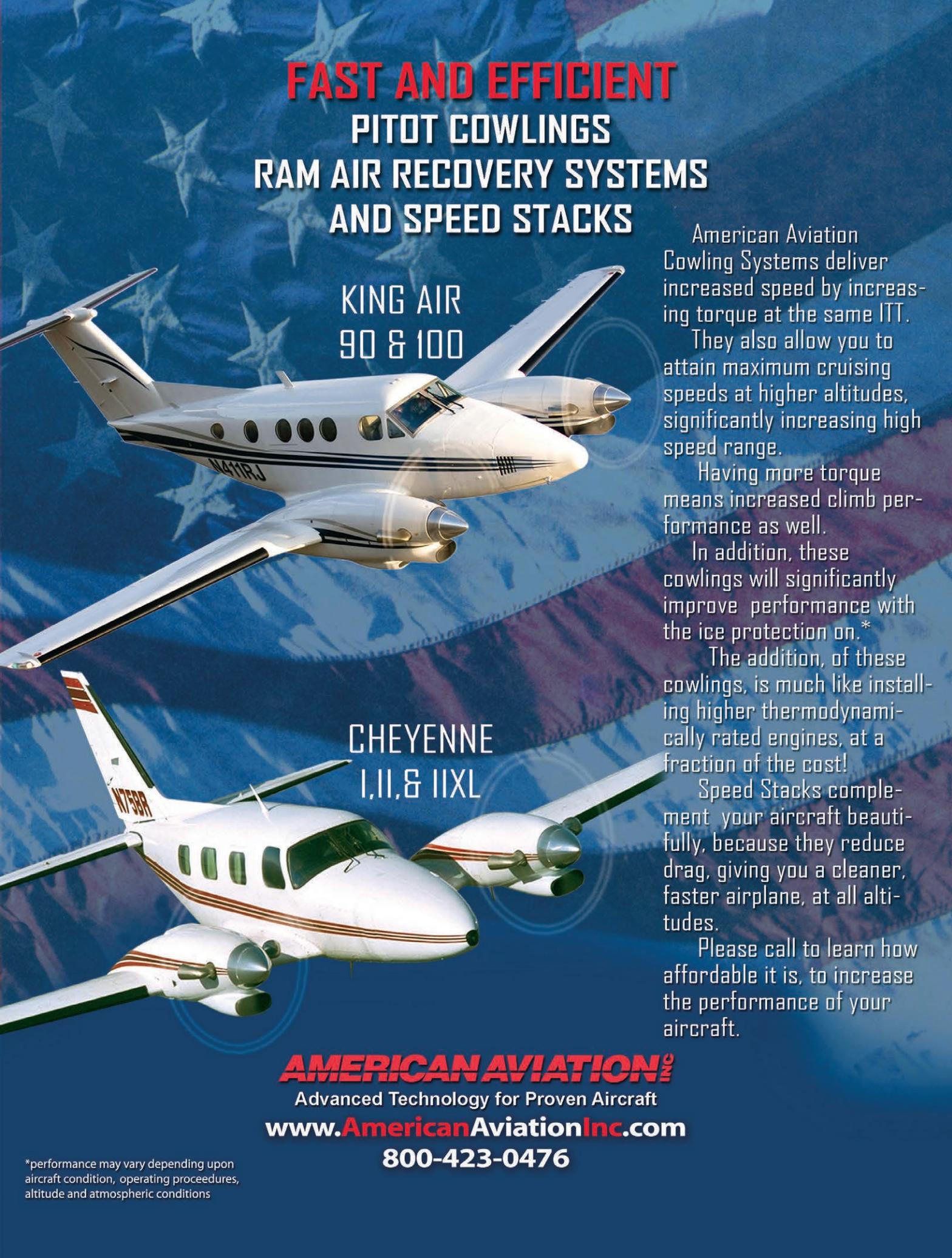
So, is a Blackhawk conversion right for you? Simply put, if you want the best climb and fastest speed, you will want the Blackhawk XP67A. Or if you want to fly in the RVSM altitudes in your King Air 300/350, you’ll also want the Blackhawk upgrade. At \$1.7+ million, the conversion

is not cheap. But, speed is never cheap. From a pilot’s perspective, there is not a better performing King Air to fly than a Blackhawk 350. From a passenger’s perspective, the converted 350 is quieter and faster. Block-to-block speeds are certainly quicker, not only due to the higher cruise speeds but also because the airplane climbs to faster cruise speeds.

A note for those interested in flying in RVSM airspace: The rules recently changed in January, 2019 which make ownership of a properly equipped ADS-B RVSM airplane easier and cheaper. The Blackhawk XP67A is ideal for use at RVSM airspace, making the King Air 350 even more attractive for the buyer who has a long way to go and wants the lowest fuel burn. The choice between a Blackhawk 350 or a comparable jet might seem difficult at first, but I think it’s an easy one once the glamor of a jet is removed from consideration. In most cases, the King Air will show up a few minutes later than a similarly equipped jet, but the King Air has bigger cabin, carries more, lands on shorter fields, requires only one pilot and costs a lot less to operate. Add in the Blackhawk XP67A upgrade, and the King Air 350 is comparative to just about any jet and not only a stock 350.

My suspicion, based on our flights and visit with Blackhawk, is that many King Air 300 and 350 owners will opt for the XP67A upgrade. In the world of aviation, power and speed are seductive. And Ron, the King Air 300 owner who accompanied me to Waco, is now weighing his options and considering upgrading the King Air 300 he presently owns. As the pilot, I hope he does. A King Air 300 with the Blackhawk XP67A engine upgrade would be a perfect addition to the hangar. **T&T**

**Joe Casey** is an FAA-DPE and an ATP, CFI, CFII (A/H), MEI, CFG, CFII, 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](http://www.flycasey.com), by email at [joe@flycasey.com](mailto:joe@flycasey.com), or by phone at 903.721.9549.



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# Upset Prevention and Recovery Training: From Skeptic to Convert

by **Patty Wagstaff**

I used to scoff at the idea that upset training was different than aerobatic training. I thought, what was the point? Why bother with something like “upset training” when you can just learn aerobatics? I discussed this stance with friends who teach Upset Prevention and Recovery Training (UPRT), and while they explained the differences, I was still somewhat skeptical. Teach them a loop I’d say, and they will learn all there is to know about energy management, linear control feel and recovery from a botched maneuver.

Let me explain. I’m a bit old school when it comes to aviation. I grew up primarily with pilots who were products of the WWII training environment. These men (I didn’t know any WASPs – the women who flew in WWII – at the time) were taught basic aerobatics as part of their primary training. As a kid when I asked my dad what it was like to do a loop, he’d say, “Oh, it’s no big deal. Fun stuff.” He and fellow pilots might not have continued to do aerobatics in their day-to-day flying, but they considered it a normal and expected part of learning to fly. Undoubtedly, they would have laughed at the concept of an “unusual attitude” or “upset.”

Fast forward a few years, and manufacturers were attempting to sell aviation to the public as a new, safe and reliable way to travel – advertising their airplanes as “easy,” “fast,” “drives like a car!” One 1956 Cessna 172 ad said, “You must “drive” this airplane to appreciate it!” Suddenly, the term “aerobatics” seemed a little crazy or dangerous, causing people to leave that to the stunt pilots and barnstormers. Besides, who would want to fly a perfectly good airplane upside down?

So, it's no surprise when most of us learned to fly, including me in the early 1980s, aerobatics was not a part of our private or commercial pilot curriculum. It's only a recent development that Certified Flight Instructors (CFI's) are required to have a modicum of spin training. I'm sure I wasn't unusual that in the back of my mind I wondered, "What if?" What if I get into a spin? What if I encounter wake turbulence? Will I know what to do?



There are unintended consequences in everything we do. Flying was meant to be safer with spin resistant airplanes, autopilots, thorough instrument training, and later, glass cockpits. But alas, pilots are still getting into trouble and Loss of Control In-Flight (LOC-I) is the number one cause of fatalities in aviation today.

Here are some sad and disturbing statistics:

- Loss of control – mainly preceded by stalls – accounts for the largest number of fatal accidents across the board in all facets of aviation;
- In the last 10 years, LOC-I has accounted for almost half of all fatalities in commercial aviation and general aviation (GA) worldwide;
- Between 2008 and 2016, there were about 1,000 fatal LOC-I accidents in GA;
- In 2017, there were 86 general aviation LOC-I accidents with 146 fatalities;
- 40 percent of corporate and business flying accidents over the last decade were due to LOC-I;
- Most LOC-I accidents are fatal.

Loss of control is usually preceded by an "upset." If an upset isn't counteracted with proper control inputs, the airplane is likely to stall and can lead to LOC-I. The FAA defines an "airplane upset" as an airplane in-flight unintentionally exceeding the parameters normally experienced in line operations or training:

- Pitch attitude greater than 25 degrees nose up;
- Pitch attitude greater than 10 degrees nose down;
- Bank angle greater than 45 degrees;
- Within the above parameters, but flying at airspeeds inappropriate for the conditions.

The leading causes of airplane "upsets" are environmental (e.g., weather related, turbulence), pilot induced (e.g., distraction) and system anomalies (e.g., instrument failure).

Can we blame the pilots of two of the truly tragic (and ultimately unnecessary) LOC-I accidents over the past few years – the high-profile Air France 447 and the Colgan Air crashes? I don't believe so. How can you blame pilots who haven't received enough training in the basics of Angle of Attack (AOA), deep stalls and the concept of unloading a wing to recover from a stall? After all, they flew with government-issued pilot certificates.

So, what is happening? Are airplanes just falling out of the sky? In my mind, loss of control conjures a pilot in a perfectly good airplane flying along and all of a sudden the airplane tumbles out

of control – which I would add, a certified airplane cannot do. Under FAA Airplane Certifications FAR's 23 and FAR 25, misbehaved airplanes are prohibited. Airplanes must have a "downward pitching motion when stalled."

A stall – what is it? Why does an airplane crash when it's subjected to this mysterious "force?" A: It is simply a loss of lift when the wing exceeds its critical angle of attack. A: Pilots have been doing it since the Wright Brothers. A: In a certified airplane, the stalled wing and its effects have been explored quite thoroughly. A: The recovery for a stalled wing is reduce the angle of attack and the wing will fly again. We do this by placing the elevator to the neutral or forward position. In other words, "Stop pulling back on the yoke."

To the inexperienced pilot, the nose dropping in a stall – subjecting the pilot to half-G or even 0 G – causes a "startle" response, which is to pull back on the yoke to get the nose back up. Because this is often followed by a large aileron input to counter any roll, the airplane transitions from an "upset" to a "stall-spin-crash-burn."

Let's talk about the startle factor; it's a universal human response. We have been walking around the planet earth a long time at 1 G. To a human, any sensation that is less than 1G equals falling. We don't like to fall. This response is so ingrained in humans that infants just moments old startle when subjected to less than 1 G. If the baby is held in the palm of the hand and gently dropped down, it will startle. It has a medical name – the Moro reflex. This is something a pilot must experience and be sensitized to while training in the cockpit. It cannot be experienced in a simulator.

What is the difference between Upset Prevention and Recovery Training (UPRT) and Aerobatic Training? While both types of training will train a pilot to recover from unexpected situations, the differences are in the focus, efficiency and length of training. Aerobatic training focuses on completing aerobatic maneuvers with precision and putting maneuvers together into a sequence utilizing energy management. Aerobatic training can last a lifetime. You can learn a lot in five or 10 hours, but trust me,

after 30-plus years of aerobatics, I'm still learning (and that's what I like about it). On the other end, UPRT focuses on awareness, avoidance and maintaining aircraft control by identifying a problem and then correcting it with proven recovery techniques. UPRT courses usually take between one and three days, and whether taught in a basic trainer like a Super Decathlon or a higher performance Extra, are transferable to any airplane you fly – assuming it has wings!

People often ask if UPRT taught in simulators is effective. While it certainly can't hurt, if simulators had properly prepared pilots for loss of control situations, then why are accidents still occurring? UPRT training, to be most effective, must be in-cockpit. Positive, negative and lateral G's and startle factor are near impossible to replicate in a simulator. Psychological effects (sweaty palms and fear) in the airplane can be significantly different than in a simulator. Simulator limitations mean upset recovery is not the same as in an airplane, and can result in a negative transfer of learning.

Sometimes to move forward, you have to go back to the basics. If you feel you are lacking in a skill that you didn't receive when getting your ratings, then it might be time for you to look for additional training. It is up to us, as pilots, to seek out additional and potentially lifesaving "upset" or aerobatic training. Doing the right thing isn't always required, like brushing your teeth, but you know it's the right thing to do. Wolfgang Langeweishe wrote the following in his classic book, "Stick and Rudder" in 1944:

*"...there is much of animal training in our flight training methods...for you simply cannot go against your common sense, against your most powerful instincts, except by drill, and more hard drill..."*

And nothing has changed since. 

**Patty Wagstaff** is a three-time U.S. National Aerobatic Champion, founder of Patty Wagstaff Aviation Safety, LLC and an international airshow pilot. Inductee of the National Aviation Hall of Fame, Patty enjoys teaching pilots how to be more skilled, confident and safe, and to ultimately get more enjoyment out of their flying. Learn more at [www.pattywagstaff.com](http://www.pattywagstaff.com).

## Confessions of a UPRT Instructor

by Jeff Rochelle, USAF Ret.



As a former fighter pilot, airshow pilot, helicopter pilot and biz jet pilot with a little time flying in the bush, I can honestly say my most rewarding experience in aviation is training corporate and GA pilots the finer points of Upset Prevention and Recovery (UPRT). Not only is this training valuable to the recipient, it is personally gratifying to have the opportunity to give back to the aviation community.

A life in aviation is one of continual education and improvement. We never stop learning and should always maintain or improve our skills. If we are true to ourselves, there is so much to experience and know in aviation in all its forms. To think one has it all figured out is, with a doubt, the riskiest mindset to have. Piloting skills depend on our best mental and physical abilities at all times. We owe it to ourselves and our loved ones to always do the right thing; that is, to maintain and improve those skills.

That is exactly what the pilots who come to fly at Patty Wagstaff Aviation Safety, LLC (PWAS) aim to do. Most attend because they recognize the reality of encountering an upset situation. Others realize the onset of "skill decay" after years of flying on autopilot. Each accepts the need to get back to being an aviator and not just a "flight systems manager." Some take the training because their chief pilot requires it – others because the aircraft manufacturer requires it. Some are excited and thrilled while others are filled with trepidation and anxiety. Regardless, every pilot completes the course at his or her own pace. They leave feeling confident and more capable than ever to fly safely and handle any unforeseen situation with the skills taught at PWAS.

The testimonials by our students and the known "saves" we are aware of speak for themselves. I encourage pilots at all levels to step up and "Do the Right Thing." Get some UPRT and be the most confident and capable pilot you can be.

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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
166	CITATION 500
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
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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
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3	HAWKER 125-600AS
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4	JET COMMANDER 1121B
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12	JETSTAR II
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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
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166	LEARJET 45XR
100	LEARJET 55
4	LEARJET 55B
12	LEARJET 55C
256	LEARJET 60
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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
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24	PIPER 602P AEROSTAR
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314	PIPER MERIDIAN
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315	PIPER NAVAJO
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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  
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# Five on the Fly

by Rebecca Groom Jacobs



## WHO:

**Patty Wagstaff**

## POSITION:

President, Patty Wagstaff  
Airshows Inc.  
Manager, Patty Wagstaff  
Aviation Safety, LLC

## HOME BASE:

St. Augustine, Florida

## RATINGS:

ASEL, ASES, AMEL,  
Commercial/Instrument,  
CFII, Commercial Rotorcraft;  
Type Ratings in G-TBM, L-39,  
T-28 and Tucano

## HOURS:

11,500

### 1. Can you walk us through a typical week in the life of Patty Wagstaff?

My primary job is operating an aerobatic school and upset training program from our headquarters in St. Augustine, Florida. I usually wake up around 7 a.m., take care of my bird and dog, then head to my office at the St. Augustine Airport. I like to get emails and paperwork done early so that I'm free to meet and fly with our students. We train people to become more skilled and confident pilots and ultimately enjoy flying more.

I also fly around 12 airshows per year, which keeps me very busy. I have to stay in good shape and keep my G tolerance up, and that takes a lot of practice in the airplane. Luckily, we have an aerobatic box (waivered airspace where we can fly at airshow levels) here at the St. Augustine Airport, and there are several boxes nearby where I can practice. Most of my airshows are in the United States, but I occasionally fly international shows including one last fall in the Gobi Desert in western China.

### 2. Of all of your endeavors, what gives you the most personal satisfaction?

I would have to say that flight training – whether aerobatic, upset, recurrent or even speaking about it – has been very satisfying. I have really enjoyed the flight school more than I thought I would.

I feel we are doing a good service for people in making them more skilled and confident in their abilities. It's a good feeling to get feedback from a student saying what we taught them helped them in some way.

### 3. How much time do you devote to practicing your routine prior to an airshow? What are your goals with each performance?

I am flying around 10 to 12 airshows per year. And it doesn't matter how many airshows I fly, I still have to stay in the same shape and keep the same G tolerance because you can't afford to get out of shape at any time during the airshow season.

To develop G tolerance and the fine-tuning to fly a low-level airshow, you have to be in the cockpit and practice. I stay current, and then leading up to an airshow I will start flying every day the week prior.

### 4. How has the aerobatics sector and airshow environment evolved since you first entered the segment?

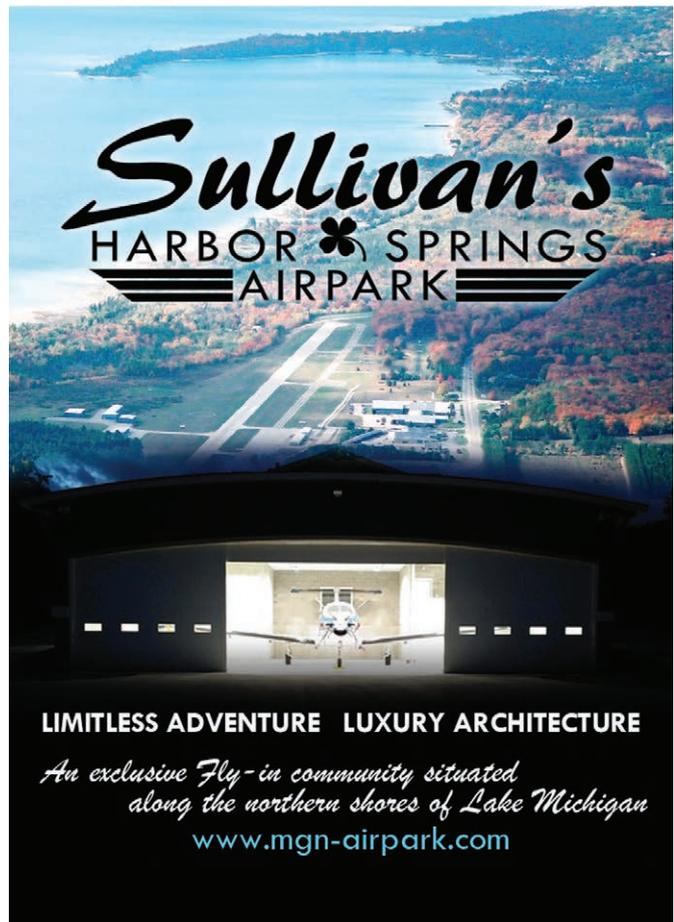
The airshow environment has not changed significantly since the 1930s. In a way, airshow pilots are still barnstormers trying to please the crowd. Sponsorships have always been a part of airshows (think Roscoe Turner, Al Williams), so having a sponsor's names on your wing is not a new thing.

The biggest change I've seen is the development of airplane technology and composite construction. When I started in the mid-1980s, we flew airplanes with wood wings and metal props which were fine but not strong enough to withstand the style of flying you see today. The development of carbon fiber and composite construction of airplanes and propellers has made a huge difference and changed the style of aerobatics.

5. *When conducting upset training with clients, what is the most common "ah-ha!" moment?*

I think when we discuss the "clutch reflex" and our tendency toward the instinctive response to pull the yoke back during an unexpected occurrence in an airplane, e.g., an "upset." Pilots don't really understand it until they experience a real in-cockpit (vs. simulator) upset for the first time. Even the most experienced pilots, when encountering an in-cockpit upset want to pull back on the yoke instead of relaxing and "unloading" the wing to let it fly.

It always surprises them that their reaction went against what they have read and heard and even been trained for in a simulator. This is one of the main reasons why it's so important to get pilots in the cockpit for real-world training – and how we have to train to overcome our human instincts. 



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## Fly It Like a Fighter A firsthand glimpse at jet upset recovery training.

by Jared T. Jacobs



Following weeks of anticipation and excitement, the time has come for my upset recovery training. I arrive at a hangar on the east side of Tampa's Peter O. Knight Airport (KTPF) belonging to Dr. Daniel Greenwald – long-time flight instructor and founder of the Angle of Attack Experience. We are not here to fly, but to prep for our next day of flights in Dan's two personal aircraft, an L-39 Albatros and an Extra 330LT. Seeing as this would be my first exposure to upset recovery/aerobatic training, there is much to discuss.

As Dan begins an abbreviated ground training session, I quickly conclude that when it comes to aerobatic flying, I do not know what I do not know. Thankfully, this is not Dan's first time around the patch, and he recognizes where my knowledge of "normal" aerodynamics ends and uses that in conversation to build a bridge to "abnormal" and aerobatic aerodynamics. For instance, one concept new to me is disconnecting the flight controls from their typical roles. In "normal" attitude flight, when on the front side of the power curve, we are all

well aware that pitch is controlled by the elevator. However, if you are in 90-degree knife edge flight, the pitch will now be controlled by the rudder, and thus I learn a new term: "top rudder."

As our conversation wraps up, Dan produces a couple of books for some nightly reading – "Fly for Fun" by Bill Thomas and "Better Aerobatics" by Alan Cassidy. I later sit in my hotel room reading and chair flying the assigned maneuvers (aileron roll, slow roll, loop, barrel roll), and my excitement begins to morph toward nervousness. Though I hold multiple type ratings and fly aircraft all over the world, it has been a long time since I have found myself out of my element. But here I am working very hard to grasp the most basic building blocks of aerobatics. I take a big bite of humble pie, do my best to channel my inner student pilot and keep my nose buried in the books. But in the back of my mind, I can't help but wonder if maybe I bit off more than I can chew?

### Pre-Flight

The next morning, Dan and I arrive to the My Jet Manager hangar located at the Lakeland Linder International Airport

(KLAL). I soon get my first glance at Dan's meticulously maintained Aero Vodochody L-39 Albatros. The red, white and blue paint scheme quickly draws my eye. Even as it sits in the hangar, the L-39 looks fast with its long, sleek fuselage framed by dual engine inlets.

A man on a mission, Dan dives right into the pre-flight inspection which begins at the Sapphire auxiliary power unit with a check of the unit's oil level. As we are adding oil to the small jet engine, Dan explains that much like in large business jets, the starting of the main jet engine is accomplished by using battery power to start the small power unit, which then can be used to power the start of the much larger main aircraft engine.

A certified A&P, Dan continues the pre-flight in a thorough and methodical manner, explaining the different systems as he goes – hydraulic (normal and emergency), pneumatic, fire suppression, ejection seats, etc. He is also careful to point out any aftermarket modifications that may have been made that alter the aircraft from its original version. Combining this in-person tutorial with

the information I read in Dan's recent Twin & Turbine article ("L-39 Albatros: Own and Fly a Fighter Jet," Feb. 2019), I feel that I have a decent working knowledge of the airplane.

Dan offers to let me fly from the front seat of the aircraft and I excitedly accept. He then spends a few minutes discussing the location and use of the different systems that I will be required to operate, specifically the ones he will not have access to in the back seat (Sapphire and engine start controls, flaps, gear, GPS navigation). Following the cockpit tour, Dan dives into the ejection seat training – a briefing utterly unique to me.

are no toe brakes. Instead, there is a brake handle (think bicycle) mounted vertically on the control stick that can be squeezed to apply brakes evenly to both main wheels, or alternatively full rudder pedal deflection in either direction will apply differential braking. Slowly, I lurch the jet left then right and we make our way toward Runway 23.

"Keep in mind that the brakes are \$35,000," Dan says as I once again bring the aircraft to an abrupt and inadvertent stop while trying to make a left-hand turn. I laugh nervously and try again to taxi to the hold short line without any more trouble.

## If you haven't really seen it or felt it, will you be able to follow the crucial procedures when you unexpectedly find yourself in an upset situation with seconds to react?

Maybe it's the thought of strapping myself to a rocket capable of launching me from the aircraft with a force of 16 G's or just the possibility that it could be required, brings me a level of anxiety. Things are getting real.

My harness is strapped and cinched, a helmet is put on my head, the canopy is lowered and I latch it closed. "Go ahead and turn on all of the red switches on the front of the lower right-hand panel," I hear Dan yell forward to me.

"Battery – On, Engine Bus – On, Radio Master – On," I yell back. With the last switch, I hear the intercom crackle to life.

"OK, com check one," I hear clearly through my headset. Now working like a seasoned crew, Dan walks me through the before engine start and starting engine checklist with a very natural call and response method. We monitor the engine start indications then quickly complete the remaining switch flips and before taxi checks. I finally look out of the cockpit and am struck by the incredible visibility from the wide-open canopy.

Dan continues to coach as I start to taxi to the runway, which I discover is no small feat considering that the nosewheel is free-castering and there

### Flight

With the engine run-up complete and takeoff clearance obtained, I clumsily bring us into position on Runway 23 and push the power lever all the way up. With 3,800 pounds of thrust coming out the tailpipe of the AI-25TL engine, I release the brakes and my back is pushed into the ejection seat as we quickly accelerate down the runway. We rapidly reach 100 knots and Dan instructs me to raise the nose 5 degrees. We set our initial climb attitude, retract the gear and bring up the flaps. Anyone familiar with flying CJ's or



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other light jets will be familiar with the performance of the L-39. With a climb speed of around 220 kts and a climb rate from 2,500-4000 fpm, it is nearly identical to that of most light business jets.

We point the nose south and scout for a large enough hole in the scattered layer of clouds. Dan spots one that he likes and tells me to climb through it. But clearly not satisfied with my "corporate pilot" climb technique, he takes the flight controls and shows me how to do it fighter pilot-style. We rocket above the cloud layer and the controls are transferred back to me.

"Alright, starting on a south heading, level at 11,500, let's do steep turns left and right," says Dan.

I roll in left aileron and start what I would consider to be a standard 50-degree banked steep turn. Dan, sensing something still hasn't clicked in my brain, shouts, "It's a fighter jet, dude! Bank it and pull!"

That is all of the motivation I need. I push the stick hard to the left and pull it towards my belly. I quickly feel the



Jared Jacobs (left) with instructor Dan Greenwald.

higher G loading set in as the G meter on the Garmin rolls through +2.0 G's. Channeling my inner Maverick, I lead the roll out and swing the stick hard right. The jet happily rolls through wings level and into a nearly 80-degree bank back to the right.

Once we level out back to our south heading, Dan asks me to close the throttle

and pitch the nose up 20 degrees for a clean stall. I comply and hold the nose up until I feel the onset of a noticeable, but not overly violent buffet. Instinctively, I drop the nose and cram the power in.

As I wait the 8 seconds required for the engine to spool up from idle to full power, I hear "Woah there, cowboy. It looks like you got the memo to reduce

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your AOA!" The L-39 is apparently very sensitive to pitch and I have effortlessly brought the nose down 20 degrees below the horizon. Though a little excessive, I think I have done my training proud.

Now fully recovered from our stall I am asked, "How's your barrel roll?"

I laugh and opt to let the master show me the ropes first. Dan takes the controls and we pitch 20 degrees nose up and then comes a hard bank right and the world below fills the canopy. I do my best to track Dan's control inputs as the aircraft continues to roll before bringing us back to straight and level flight.

"Beautiful," is all I can summon. Now it's my turn. I pitch up just as Dan did and begin my roll to the left. We are up and over the top quickly but my roll rate isn't keeping up with the pitch as it should.

"Roll," I hear through the headset. "Roll, roll, roll."

With Dan's help, I get the roll caught back up just in time to bring the nose up to the horizon. I complete the maneuver in what I would characterize as a valiant first effort. With precious jet fuel burning, we quickly move on to the aileron roll.

"Pitch up 10 degrees, neutralize the elevator and then just roll it as hard as you can," Dan instructs.

Refusing to be accused of not flying the aircraft like a fighter jet a third time, I commit to the maneuver. I push the stick as hard as I can to the left and feel it hit the stop and I hold it there. The airplane rolls rapidly around its longitudinal axis, and I find that my eyes have a hard time keeping track of the roll rate. But I am able to catch the roll just in time to level the wings as we approach 0 degrees of roll.

"Nice, try it to the right now," Dan says. He doesn't have to tell me twice.

Next, Dan takes the airplane and completes his version of a course reversal which involves a 90-degree bank and a 3 G pull. With the sudden onset of G's, I feel my head start to drop and I immediately begin pressure breathing to try to keep the blood in my head from being pulled to my feet. We roll out on a north heading and Dan begins briefing me for the unusual attitude portion of the flight.

"You have two conditions: high energy and low energy. If you are high energy, the appropriate response is to roll wings

level and then bring the nose up to the horizon and pull power if you have to for airspeed. Low energy, you want to simultaneously add full power, roll into a knife edge and let the nose fall to the horizon."

This is all information that as a flight instructor and a professional pilot I have heard and said countless times. But as Dan starts putting me through the wringer of rolls and G's, most of my logical thinking is pushed aside as I try to keep from blacking out. Just when I think I can take no more and I am

utterly disoriented, Dan gives me back the flight controls. I open my eyes and all I see is blue sky. Instincts take over and I roll the airplane into a knife edge and let the nose drop down to the horizon where I level it out and return to straight and level flight.

"What happened to your power?" Dan asks.

I realize that in the heat of the moment, in a maneuver I have performed hundreds of times in aircraft and simulators, I forgot one of the crucial steps of

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the upset recovery procedure. It is at this point that I am struck with the reality of the situation and why upset recovery training is so crucial. When given the controls of a jet that is pitched up 70 degrees and in a 40-degree bank; when you can hear the air noise dropping off as the airspeed decays and the G forces drop from +3 to less than 1 – and you have never actually been in this situation before – items can be missed.

Suddenly, I am far removed from the fun of barrel rolls and am reminded what this training is really about. Yes, a basic understanding of aerobatic flying is beneficial for upset recoveries, but the reason behind those maneuvers is this: If you haven't really seen it or felt it, will you be able to follow the crucial procedures when you unexpectedly find yourself in an upset situation with seconds to react?

I enter the next upset scenario with a greater appreciation and resolve to execute the maneuver correctly. This time, when given the controls, I see a canopy full of ground and I immediately

start verbally talking myself through the procedure etched in my brain: "Nose is low; power to idle; wings level; slow pull up."

Even as I say the words "slow pull up," I feel the G's start to come on in a way that a simulator simply cannot recreate. My eyes find the G meter again and I notice that it is creeping towards the +3.6 G limit of the CJ4 that I regularly fly. Yet another notable lesson: Even with a conscious effort to not overload the airplane, it can easily happen when adrenaline is coursing through you after being faced with a view of the ground and an airspeed climbing through 300 knots.

### Landing

We make our way back to the Lakeland airport and Dan demonstrates the landing profile to me in the form of a low pass. As the jet spools up, the flaps and gear are retracted, and we pull up into a steep climb, Dan then hands the controls back to me so I can take a shot at an actual landing. As he instructs me through the pattern, I again see nearly

identical speeds and pattern spacing to those I would fly in the CJ. With this assurance, I configure the airplane, make the turn to final and at about 100 knots over the fence, commit to the landing by finally pulling the power to idle (power is kept above 80% N2 until there is no possibility of a go-around due to the engine spool up time).

With a slight nose-up flare, the trailing link gear contacts the runway, helping me look like a seasoned professional. Speed brakes are deployed and I am able to use the hand brake to slow the aircraft down and exit the runway.

One flight down. Many lessons learned. One flight to go. **T&T**

*Stay tuned for "Part 2" – Jared's flight in the Extra 330LT – in an upcoming issue.*

**Jared T. Jacobs** is an ATP-rated turbine pilot, instructor and mentor. He currently flies corporate aircraft both single-pilot and as crew for a Fortune 500 company.



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## Check Ride

by Kevin Ware

We are in a Lear 45 at 15,000 feet over the far northwestern corner of the continental United States, just on the edge of the Olympic mountain range near a VOR called Tatoosh (TOU). The weather is crummy, with cloud layers every 200 feet or so, making visual flight between them almost impossible. The purpose of this flight on this grey and rainy day is to complete a check ride and I am the victim sitting in the left seat. Rob, a very personable FAA Designated Pilot Examiner (DPE) from out of town, is carefully watching my every move from the seat behind the cockpit and to my right.

The DPE is in the back as it is customary in aircraft requiring a crew of two to have a pilot already typed, current and insured in the airplane (in this case, fellow Lear pilot Tim) flying as co-pilot. It is about two o'clock in the afternoon, and we have been at this since nine in the morning. The first hour was spent getting the FAA's cumbersome computer inputs completed, followed by a two-hour oral exam on every aspect of the airplane. At noon, we took a lunch break at the local airport café. We then returned to do a pre-flight and brief on all of the airborne maneuvers expected by the FAA.

Now, we are working our way through those requirements in a block of airspace we arranged for with Seattle Center (with the controller being quite mindful that we stay within our assigned area). I have the autopilot on with the heading and altitude hold selected, and the power back while I wait for the little jet to slow down and stall. The airplane is slicker than a greased arrow and is decelerating way too slowly for the controller who is

concerned we will fly out of his airspace while in the middle of our maneuvering. Although it is not part of the pre-arranged check ride procedure, I deploy the spoilers to help slow us down, then stow them as we pass through 140 knots. We have just entered another cloud layer when all of a sudden everything breaks loose, with the stall warner announcing "stall, stall, stall," and the stick shaker going off with a noisy vibration which to me, always sounds like an angry rattlesnake. At this point (surprise, surprise) the autopilot clicks itself, and the left wing drops slightly while the vertical speed picks up a lot in the downward direction.



The trick is for me to recover as soon as possible while losing a minimum amount of altitude. So I pitch down the flight director bars to the horizon and push up power on both engines until the annunciator says "takeoff" (T/O), roll the wings level and watch as the Honeywell TFE731 engines kick in with every bit of their 7,000 pounds of thrust and accelerate us quickly through 180 knots. Now my job is to rapidly get back to the original altitude and heading, all the while being careful not to let the airplane go too much faster. The nose comes back slightly above the horizon bars, and the power is back to about 65 percent as I re-trim the airplane and get ready for the next maneuver. I

look back at the DPE to see if that was satisfactory, but the expression on his face is difficult to read.

Tim sitting to my right, however, says "good recovery" and that we need to do another one, this time in approach configuration. So, I slow the airplane down, call for flaps 20 at 200 knots, then full flaps and "aux 'hyd' gear down" at 150 knots and repeat what I just did. By this point, we have been in the air for about 45 minutes but are less than halfway through the check ride. Though I might look calm and collected on the outside, I can feel that the T-shirt under my dress shirt is already soaked with sweat. It's a

reminder that I really don't like check rides despite having taken dozens of them and not failing a single one. But, like an opera, you never know the outcome until it's over.

Wet T-shirt notwithstanding, we then do steep turns which in spite of some turbulence and intermittent visual conditions, I manage to complete within the prescribed limits. When these are

completed, we are supposed to make an autopilot coupled approach followed by a single-engine go-around. But when activating the autopilot button, the thing refuses to engage. Now, check ride or not, Tim and I have a real airplane problem.

I ask him to pull out the POH (pilots operating handbook) and look up the checklist for autopilot failure. He quickly finds the correct page and says we need to find a particular circuit breaker on the pilot side of the cockpit. I tell him, "You have the airplane; I will look for it." There are, of course, dozens of circuit breakers on my left, all set up in some logical fashion – at least in the eyes of an engineer, but not at all to a pilot in the

middle of a check ride. I grope around for a bit and cannot find one labeled as described by Tim, so he says, "Here, let me look for it."

I switch back to "pilot flying," while he reaches awkwardly across my lap to find the errant breaker. As it turns out, it is labeled differently than the checklist describes, but he eventually finds it and we complete the items required to re-boot the autopilot.

Obviously, this part of the flight was not on the prescribed set of check ride maneuvers, so I glance back into the cabin where our DPE is sitting, and to my alarm, see his expression appears less than pleased. In fact, he is a bit pale and looks unhappy. I can't decide if he dislikes my flying or is ticked off that we departed from the briefed check ride maneuvers – or does that slight pallor suggest he is sick? I give him a thumbs up and a questioning look, and he just swallows hard and grimaces. Whatever the problem is, it does not look good for my check ride.

Our next maneuver requires setting up for a holding pattern at Port Angeles (KCLM) to be followed by an engine failure, an ILS and a missed approach at which time one of the engines is supposed to fail at the worst possible time – when you advance power close to the ground on the go-around. What you have to really watch for is heading and pitch control because as the "good" engine comes up to full power, it tends to change the airplane's heading rather quickly unless you are right on it with opposite rudder and a slight bank into the good engine. Of course, you also have to be calling "missed approach," hitting the "go-around" button on the throttle, pitching up to get a positive rate of climb and then instructing the co-pilot to pull up the gear and most of the flaps and start the missed approach checklist. It feels like way too many things to do at once, but like the proverbial duck who is calmly swimming across the lake with its hidden webbed feet moving like crazy, I seem to get the items done in correct sequence and within limits. Leveling out at the correct missed approach altitude and turning the autopilot back on, I look back for approval from our DPE, only to see him frowning. Again, I think, "Uh oh, this is not going well at all."

We circle back around, complete a holding pattern on one engine, then another approach with the autopilot off, which seems to work out (at least to Tim and myself). We then head back to KBVS, our home airport, for the last approach; this one being what used to be called a "non-precision" approach as opposed to an ILS. The weather at KBVS is down to 400 and 1, and we break out at minimums, at which time the I click the autopilot off, and say, "Runway in sight, landing." Tim replies, "Checklist complete, gear down, runway clear" in proper CRM fashion. I have the airspeed almost nailed at  $V_{ref}$ , and as luck would have it, proceed to make a "greaser" of a landing on the wet pavement. When clear of the runway, we finish the after landing checklist and I again glance back at the DPE, looking for what I hope is an encouraging nod after my great landing, but he appears even more unhappy.

I pull the Lear up to our line gal Gwyn, and stop the airplane so gradually you cannot tell when movement ceased, then shut the engines down. As we are finishing the checklist, the DPE opens the door and heads into the FBO without saying a word. When they do that, it just has to be "pink slip" time, and I start to wonder just how and where we screwed up.

But, on entering the FBO myself 10 minutes later, our DPE is not sitting at a desk writing on pink paper, but rather is nowhere to be seen. So, I ask Lori the receptionist where he went, and she just nods toward the bathroom door. After another 10 minutes or so Rob, exits the bathroom looking pale and shaken, and says "good check ride," then promptly makes a 180 back to the bathroom. A little while later, he emerges to say the

club sandwich he had at lunch did not go down well, and he feels too sick to complete the following check ride with one of our other pilots. I ask, "You sure it was not my flying that made you airsick?" He musters as much humor as he can and replies no, it was definitely the club sandwich. He says he would like to go back to the hotel and will finish the paperwork tomorrow when he feels better. We arrange for a ride to take him there, and that evening I call his room to make sure he is doing okay. He appreciates my concern and says he should be just fine by the morning.

The next day, I show up at the airport and see Rob still looking a little under the weather but working away on his laptop in order to get my new temporary license printed out. After a few minutes, he hands me two copies of my new license (just in case one gets stolen), and says, "Nice check ride. You guys are a bunch of real professionals."

As I get ready to leave, we shake hands, and he says though he is feeling well enough to finish the remaining two check rides, he will never again eat a club sandwich at our airport café. **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](mailto:kevin.ware2@aol.com).

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# From the Flight Deck

by Kevin R. Dingman



## Come Help Me Mayday, Mayday, Mayday Why the alliteration?

### 6-1-1. Pilot Responsibility and Authority

*In an emergency requiring immediate action, the pilot-in-command may deviate from any rule in 14 CFR Part 91, Subpart A, General, and Subpart B, Flight Rules, to the extent required to meet that emergency.*

The plan of this pontificating, but penitent, professional pilot was to pen this “mayday” story for the May issue of T&T rather than June. It certainly would have better aligned with the Spring holiday and said author’s sometimes playful panache. But due to requests from billions and billions (thus spoke Carl Sagan (and Zarathustra – Nietzsche)) of enquiring minds, last month’s article, “Max Mania” about the B-737 MCAS, prompted traffic priority at the publisher and is the reason for this month-mixing-mayhem.

And now, like the 737 Max, misbehaving AOA sensors have invaded GA and precipitated the grounding of yet another entire fleet: The Cirrus Vision Jet. May’s MCAS article and the priority it was given at the press seems to have prophetically provided a plausible prologue for a story about requesting traffic priority if our own plane presents us with a pickle of a problem. “Mayday, mayday, mayday” is itself an alliteration-like three-peat (the reason for which will follow), and thus perfectly personifies this Nietzsche referencing, alliteration polluted, preparatory paragraph.

### ICAO’s Warm Beer

The mayday procedural word was originated in 1923 by a senior radio officer in London. He proposed the expression “mayday” from the French “m’aider” (help me). It’s now used to signal an emergency by aviators, mariners and in some countries firefighters, police and

transportation companies. The call is given three times in a row to prevent it from being mistaken for similar-sounding phrases and to distinguish an actual mayday call from a message about a mayday call – and thus the alliteration three-peat. In 1927, mayday replaced SOS as the standard distress call. Commonly used worldwide for years, it’s only now beginning in the U.S. to replace our traditional aviation-radio transmission of “we are declaring an emergency.”

Was the delay because of our well-known, pilot-cowboy mentality of bucking all things involuntarily imposed or foreign: the metric system, warm beer, driving on the wrong side of the road and unshaven armpits? Or perhaps because most inflight emergencies that prompt our distress are not normally the stereotypical Hollywood type, “Cap’n it’s the dilithium crystals’ – we’re goin’ down!” type of an emergency. Our situation may only require expedited traffic priority or special services after landing such as ARFF, an ambulance or cold beer and a pink plastic razor. Our consternation over ICAO (International Civil Aviation Organization) terminology – line up and wait vs. position and hold, millibars vs. inches of mercury and mayday instead of emergency, for example, will likely be a battle against our rebellious nature and the movie stereotype mayday call to which we’ve all grown accustomed.



### It Sounds Dire

As you know, the dial-a-disaster chamber never operates in day VMC, with both engines producing thrust and all flight controls operating normally. Each takeoff, approach and landing will include all the standard weather phenomenon and system emergencies plus runaway trim, full stalls and even cold crew meals – have you ever seen such cruelty? (Blazing Saddles).

During the most recent cycle of simulator training at my carrier, we transitioned to using mayday instead of declaring an emergency. And when we used mayday in the sim for each and every one of the above situations, it did indeed make them sound direr than “simply” declaring an emergency. After transmitting “mayday, mayday, mayday,” it’s difficult to keep our Hollywood trained mind from hearing screaming passengers and the hero yelling, “We’re goin’ down!” But picture if you will (in my Rod Serling voice), a routine inflight medical emergency with the need for traffic priority, a diversion and ARFF after landing. I’ve had about a half-dozen of these in real life, in both Part 121 and 91, and a few more in the dark and scary sim. In each of them, I declared an emergency, and in each, the person in need of medical attention survived – except the ones in the sim – no one gets out of there unscathed. After transmitting mayday, mayday, mayday so many times, it became more comfortable, but we found that adding the “E” word along with mayday made it feel less catastrophic.

### An Example Mayday/ Emergency Call

Make the initial call on the frequency in use, but if not possible, squawk 7700

and call on 121.5. The call should contain the name of the station addressed, your call-sign, the nature of the emergency, fuel (in minutes), the number of SOB's (souls on board), your intentions and your request. Since the radio call is supposed to begin with "mayday, mayday, mayday," in order to combat our difficulty in the transition to using mayday instead of emergency, perhaps we could squeeze in the word "emergency," and transmit something like this: "Mayday, mayday, mayday. Albuquerque Center, Cirrus 117 Charlie Romeo; we have a medical emergency. One hundred sixty minutes of fuel on board and four SOB's. We need to land immediately at Taos. Request radar vectors for the RNAV 13 and ARFF after landing."

By using the attention-getting and traffic-stopping word "mayday" like the ICAO folks want, but then adding our Yankee emergency declaration, perhaps we can quiet the Hollywood, no-warm-beer-cowboy within us and still receive the priority and assistance we need. But don't mention the beer or pink razor thing - I was only kidding and the

controller may not have my sense of humor. In any case, this phraseology has evolved over time to provide clarity and brevity in communications and to ensure that phrases are unambiguous. Don't freeze up over the verbiage though, use plain language and any format that you want if necessary - remember the exceptions and authority granted over the piece's parts and subparts of the FAR's in an emergency.

### Wings Fall Off

One of my favorite Far Side cartoons by Gary Larson goes something like this: The picture shows a doofus-like guy sitting in a passenger seat on an airliner with multiple controls on the armrest. One control is a two-position switch labeled "Wings stay on" and "Wings fall off." The caption reads: "Fumbling for his recline button, Ted unwittingly instigates a disaster." The humorous inference, of course, is that Ted jettisoned the wings. An engine fire or failure, in the weather or at night, has historically been the direst of inflight emergencies that we face. But engine failures, while rare, that are handled with a nominal amount of training



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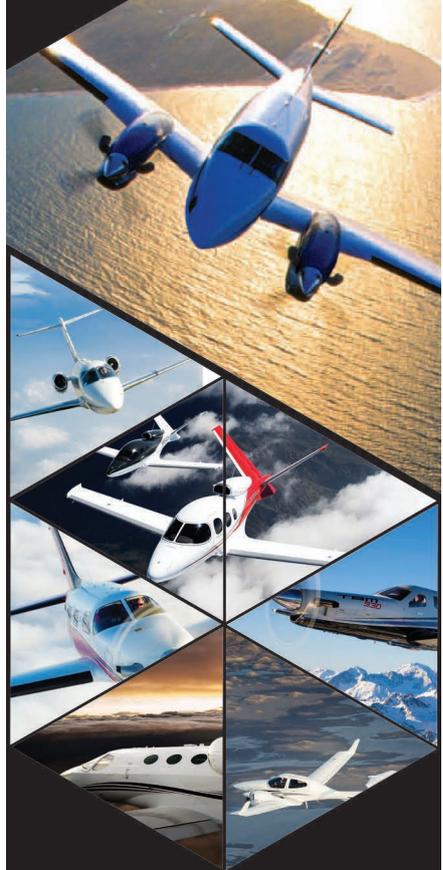
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and skill are a recoverable event. As our character Ted discovered, a catastrophic airframe, flight control (or stabilizer trim, i.e. Alaska 261, Lion Air 610, Ethiopian 302) failure can be an unrecoverable situation that no amount of training or luck can remedy, doofus involvement or not. And that's no laughing matter.

So, why use humor to discuss in-flight emergencies and the use of mayday? Because if you fly long enough, most of us will eventually experience a life-threatening (yours or one of your passengers') in-flight situation. And if it's your first time you will likely experience a shock factor, a moment (or three) of disbelief, some confusion and then time compression (you may even temporarily freeze up). The event will in no way be funny at the time but learning about the psychological effects during a stressful situation by using this type of humorous format may help you to remember and then to recognize them. Humor will also lower the mayday Hollywood-hurdle when the door to this dangerous dimension swings open.

**You're travelling through another dimension, a dimension not only of sight and sound but of mind; a journey into a wondrous land whose boundaries are that of imagination. That's the signpost up ahead – your next stop, the Twilight Zone.**

**– Rod Serling**

Inflight problems can sometimes feel surreal. But let's not allow the use of mayday to compound or elevate our anxiety to another dimension of reality. Our bodies react to such critical events through the amygdala and the adrenal gland – and there's little we can do to prevent it, but we can resist. We practice hair-raising scenarios in the simulator not only to rehearse the procedures but to help override our human nature to be afraid, to fight or flee and also to negate the perception of time compression. Hopefully, this humorous approach, and the opening paragraph's alliteration-saturated use of the letter "P," desensitized you to the use of the repetitive mayday,

mayday, mayday radio call; which in itself can add adrenaline and make it seem as though we are overreacting and overstating the seriousness of our problem.

Another upside to starting your call with mayday, however, is that you almost certainly won't hear someone advising or admonishing you with, "You're transmitting on guard – check your frequency." Just remember, unless you have Ted riding in the back or some other button pushing doofus, your cool, calm demonstration of some of that pilot stuff and using the mayday, mayday, mayday call will certainly carry, carry, carry – the, the – day, day, day. Is there an echo in here? **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 organization Wings of Mercy, is employed by a major airline, and owns and operates a Beechcraft Duke. Contact Kevin at [ding10d@gmail.com](mailto:ding10d@gmail.com).*

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# On Final

by David Miller



## Springtime Storms

On April 14, I found myself in Clearwater, Florida planning a return to Dallas with Citation M2 owner Larry King and our wives.

Springtime weather in the Southeast can be challenging as you can see from the lightning strikes along a massive cold front that morning. Indeed, the storms that we needed to cross had just ravaged Texas, Louisiana, Mississippi, Alabama and Georgia, spawning 24 tornadoes, killing nine and injuring more than 30.

The type of airplane you fly plays a big part in how you tackle the go/no go challenge. If you have the performance to get on top, it is often possible to make the trip safely. On this day, tops were above FL450, while the M2 tops out at FL410. Tornado watches and warnings were numerous. But there was a 50-mile hole between cells in the Florida panhandle.

So, from our hotel room, I started my research project to decide if we were going to stay another day in sunny Florida.

My first stab was to look at the FlightAware tracks of actual flights through the weather. A few airliners were getting through a gap at FL380 to FL400. Only one or two corporate jets were

even attempting to penetrate the area and those were at FL430 and above.

What were the airlines doing? I clicked on departures from Tampa to Dallas and quickly saw that almost all of them were planning a huge deviation north, almost to Kentucky then west to Dallas.

The live broadcast of tornado damage on The Weather Channel was making Patty anxious. I texted Larry, "We may need to punt today," I said.

I then listened to the ATC Live feed from Jacksonville Center on my iPhone app. The north deviation was working. If we departed and flew 300 miles north, we could turn west and have enough fuel to stop at Little Rock before flying on to Dallas.

It might just work.

We headed for the airport while Larry used ForeFlight to file a new flight plan to PETON intersection. On departure, JAX Center did a wonderful job assisting everyone on a very busy frequency.

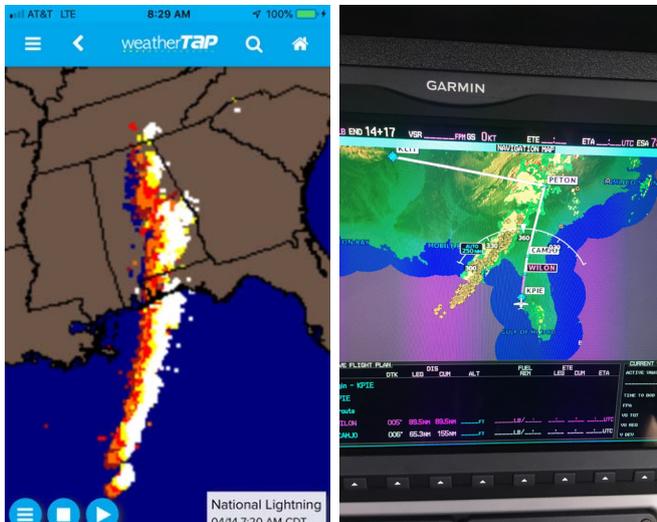
"November niner two one X-ray Tango requesting "wrong way" flight level four-one-zero for weather," I said. Almost immediately it was approved, and then a suggestion that we could turn left when able and direct to Little Rock.

After some quick calculations revealed that we could make Dallas with 700 pounds of reserve in clear weather, we made it back nonstop.

All in all, a great day of flying.

Fly safe.

*David Miller has owned and flown a variety of aircraft types, from turboprops to midsize jets, for more than 40 years. With 5,000-plus hours in his logbook, David is also Chairman Emeritus of the Citation Jet Pilots Safety & Education Foundation. You can contact David at [davidmiller1@sbcglobal.net](mailto:davidmiller1@sbcglobal.net)*



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