First Minutes of Flight / Owner's Corner: Pilatus PC-12 / Memory Proficiency

TWIN & TURBINE

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

JULY 2022 $3.95 US
VOLUME 26 NUMBER 7

RESPECTING THE PREFLIGHT

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New vs. Old Technology

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TWIN & TURBINE

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Photo Courtesy of Clint Goff

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OSH Homecoming

After a three-year hiatus, I am excited to finally return to one of my favorite places this month – EAA AirVenture. This year will mark my tenth "Oshkosh," and I feel ready to make it one of the best ones yet. It simply is hard to beat living among countless airplanes and great friends for a solid, fun-filled week.

As usual, an extensive list of valuable workshops and forums will be rolling throughout the event (with the full schedule available at eaa.org). Several sessions pop out at me regarding new products and safety, including presentations by Garmin, Avidyne, Foreflight, AOPA, EAA and NATCA (National Air Traffic Controllers Association). For those of you flying in, also helpful on the website is an entire page dedicated to "Tips for Flying into AirVenture," such as reading the notice, watching the videos, signing up for arrival texts, practicing hitting the dot, checking on parking, and bringing a friend. Lastly, to the right are some of the themes and celebrations unique to this year as highlighted by EAA.

But as the late Paul Poberezny, EAA's founder, is often quoted as saying of the fly-in: "You come for the airplanes and you come back for the people." AAfter missing last year's reunion (and the canceled previous show), those words especially ring true!

2019 AirVenture: Dianne White, Joe Casey, Rebecca Groom, Thomas Turner, Kevin Dingman.

Air Force 75th Anniversary

The U.S. Air Force was created on September 18, 1947, as part of the National Security Act, which established a separate military air branch and put all military branches under a new Department of Defense. Today, the Air Force has more than 325,000 personnel and more than 5,000 aircraft. The event will be commemorated with fly-bys, static displays, and presentations throughout AirVenture week, including evening programs at EAA's Theater in the Woods.

EAA's New Pilot Proficiency Center

The EAA Pilot Proficiency Center (PPC) is a skill-building and gathering area for those who desire to increase their knowledge, hone their abilities and network with other passionate pilots. The PPC promotes the use of training, tools and activities to help pilots maintain year-round proficiency beyond the week at Oshkosh. There will be FREE half-day clinics (pre-registration required) with keynote presentations, interactive breakout sessions, skills enhancement and scenario-based training exercises in one of EAA's Redbird Advanced Aviation Training Devices.

This year's expanded schedule gives participants the opportunity for three breakout sessions in numerous categories during the half-day clinics. Those categories include Killer Procedures, Learn-to-Turn, Backcountry Awareness, The Art of IFR, CFI-to-CFI, Stick & Rudder Redux, and The Amateur-Built Flight Test Experience.

Young Eagles 30th Anniversary

This celebration will include a number of special AirVenture activities, including a day dedicated to the program – Thursday, July 28, will be Young Eagles Day. As part of the event, thirty Young Eagles will take flight in a variety of airplanes, helicopters and powered parachutes. There will also be a Young Eagles mass photo on Boeing Plaza (all Young Eagles pilots, chapter coordinators, ground volunteers, and former Young Eagles are invited), a ceremonial Young Eagles flight to kick off the 30th anniversary of the program, a volunteer root beer float social, plus a panel and presentation at Theater in the Woods.

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Samaritan Aviation

Float planes deliver hope and support

by **Grant Boyd**

PHOTOS COURTESY OF SAMARITAN AVIATION

"The need is great, and the need is everywhere," noted Mark Palm, co-founder and CEO of Samaritan Aviation. He was referring to the humanitarian work that the 12-year-old non-profit Christian aviation organization conducts in the East Sepik Province of Papua New Guinea, along with the need for these types of aerially supported operations worldwide.

Helping others is something Palm has been doing most of his life after becoming increasingly interested in humanitarian service (and flying) growing up. As a teenager, he learned what it takes to be a force of good while working with his parents as they ran a homeless mission in Santa Cruz, California.

In his pursuit to positively impact others, Palm traveled the world and came to learn about a country where this selfless type of service had become increasingly popular: Papua New Guinea – the world's second-largest island. Palm became acquainted with the country's residents and ascertained that ministry in Papua New Guinea would be best supported using aircraft.

While there are several aviation humanitarian organizations with a presence in the country, Samaritan Aviation is the only one that operates float planes. Samaritan Aviation pilots, volunteers and those they serve rely upon a fleet of two amphibious Cessna 206's that each fly around 250 hours per year. Throughout the organization's history, they have flown more than 2,400 missions, all completed at no cost to the people in the remote communities.

In 2010, when the organization was founded, Palm shipped their first aircraft in a container from California across thousands of miles. Upon entry, it was the first float plane that had been in the country for nearly five decades. With Samaritan Aviation focusing its efforts upon

a population that lives alongside an 800-mile stretch of the Sepik River, the access to floatplanes has allowed them to support the country in a way it has never been before.

"There are only about three runways you can land a plane on along the river. But with our planes, we can land anywhere on the water. We can turn a one to three-day trip by canoe into a 45-minute to an hour flight and fly seven days a week."

The river's everchanging conditions is only one of the challenging factors the half a dozen volunteer pilots must contend with while transporting critical and non-critical medical supplies, mission workers or healthcare workers.

"The river changes every time we fly. It rises and falls pretty dramatically throughout its length. At times, it almost becomes a lake as it overflows the banks. One week you can land and pull the plane up to the clinic a hundred feet away, and the next week there is a thousand-foot sandbar there."

"Also, there are often fishing nets in the water you have to dodge or crocodiles poking their heads up, people in canoes, and other factors. The river's color is a light chocolate, so you can only see an inch below the surface. Consequently, pilots have to make a lot of critical decisions from the air."

The ability to make flexible and concise decisions is key and continually exercised competency of Samaritan Aviation pilots.

"You quickly learn how to make critical decisions and love people – that's why we are there. Overall, it is a rapidly changing environment. We had our first live birth a few weeks ago in the plane, although we have had a lot of close calls over the years. When we do medical transports, patients' heads are only a few feet away from the pilot, so it takes a certain mentality to fly in this capacity. A big part of flying is decision-making for our pilots and how they do under extremely stressful situations like someone dying in-flight, bad weather, aircraft running rough, etc."

Palm also provided a general overview of the organization's pilot qualifications and the financial contributions they bring with them. "Our pilots are required to be licensed A&P mechanics, commercially and instrument-rated, and have the heart to serve people. All our staff families raise their own salaries from their friends and church."

In addition to this dedicated pilot training program, Samaritan Aviation has a strong operational focus on its other most important asset – the airplanes. In December of this year, Samaritan Aviation is expecting its third amphibious 206 to come online in Papua New Guinea. "This new aircraft will allow us to expand across the mountains to the south side of the island, where we will begin serving another 200,000 people in the remote water communities of the Western Province."

And of course, continued maintenance of the company's existing aircraft is of the utmost importance to the organization and its served population. "Maintenance is always a challenge. But we have been blessed in July of 2021 to have added our first full-time maintenance director. Additionally, all of our pilots are A&P's. We are establishing a good system of what will need maintenance and when, but sometimes you are still down for a week waiting on a part."

Corrosion especially poses a challenge for the Samaritan Aviation team. "Where we operate is a very corrosive environment. Our hangar is literally a thousand feet from the ocean, so corrosion is one of the biggest things we fight with our planes. We keep a close eye on those things."

Samaritan Aviation currently relies upon amphibious Cessna 206's that each fly around 250 hours per year and have completed over 2,400 missions.

After operating in Papua New Guinea's conditions for more than a decade and developing a good relationship and strong buy-in from the national government, Palm anticipates Samaritan Aviation will continue to grow in upcoming years. The organization has identified another portion of the country where its amphibious expertise would provide unrivaled value. Palm believes adding a new class of aircraft to the fleet would magnify their impact upon those they serve.

"We are looking at the Caravan and Kodiak as we expand into the island's south side. It is a much bigger area to cover compared to where we are currently operating. We would start with a 206, but I have a feeling we will be in the turbines really quick once we get down there. But so much of it comes down to money."

And like other successful 501c3 organizations, much of Samaritan Aviation's operations are funded by passionate volunteers, contributions from strategic partners, and some foundations.

"Western Skyways does all of our engines at the cost of parts. They have done four engines for us now and have been a huge help and tremendous partner. We have also partnered with Aerocet Floats for parts and expertise."

These contributions from various parties, whether time or monetary-based, are each integral in Samaritan Aviation being able to meet its lifesaving mission.

Learn more at samaritanaviation.com. T&T

Grant Boyd *is a private pilot and general aviation professional. He has written more than 170 articles for aviation magazines and enjoys learning about unique aircraft missions. Grant was selected as an NBAA "Top 40 Under 40" recipient in 2020 and holds an MBA from Wichita State University. He can be reached at* **grantboyd2015@gmail.com.**

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RESPECTING THE PREFLIGHT

HOW PILOTS CAN IMPROVE AIRCRAFT PREFLIGHT INSPECTIONS

by **Brian Sagi**

Earlier this year, I met with a student for an early morning training flight. As always, I conducted my own walk around the aircraft even though the student had already preflighted prior to my arrival. While inspecting the elevator for "free and correct," I noticed a distinct "clunk" with an accompanying restriction in movement. Control surface binding is one of the most serious in-flight emergencies and can obviously be fatal.

Sensing a teachable moment, I said nothing and asked my student to show me how he checked the elevator. Observing him, I saw that he did not exercise the elevator throughout its full range of motion, instead checking the freedom of movement in a small range. When I showed him the issue I discovered, he was shocked. He told me that none of his prior instructors ever showed him how to properly inspect control surfaces for freedom of operation.

I have observed similar astonishment from pilots who, when ready to launch after conducting their own preflight, were pointed out major airworthiness items such as broken propeller spinner back plates, flat landing gear struts and landing gear pins that were left in place.

Mechanical failure is the second leading cause of aircraft incidents and accidents (human error is the top). The FAA, after analyzing over 20 years of Part 91 and Part 135 operations, found that 26 percent of all incidents and accidents involved a mechanical malfunction of an aircraft system. Granted, mechanical failures in aircraft are rare. However, nearly invariably, the aircraft presents signs that things are not normal well before a catastrophic failure takes place. Being attuned to those signs, especially when flying the same airplane regularly, can help uncover problems well before they develop into a catastrophic failures.

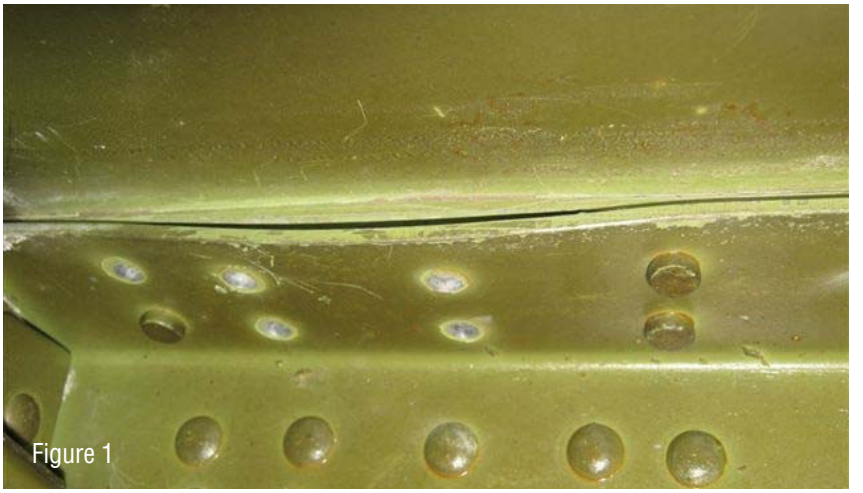


Figure 1


Figure 2


Figure 3

Preflight Deserves More Respect

So why do pilots routinely miss signs of impending mechanical failure? I find three core reasons:

First, many of us were never taught how to conduct a thorough aircraft preflight. While we all learned how to check fuel and oil levels and how to sump the fuel and check for contamination, most of us never learned what to look for in other areas of the aircraft. For example, how do we identify and spot areas subject to overstress, misassembled hardware or corrosion? What are general trouble areas for the specific aircraft model we are flying? The manufacturers' preflight checklists use generic terms such as "CHECK" and generally do not help with the detailed nuances of a proper visual inspection.

Second, expectation bias presents a major challenge to conducting a thorough aircraft preflight inspection. Admittedly, most of the time the plane is in an airworthy state. As a result, we expect the aircraft would be airworthy for today's flight as well. Flying the same aircraft consistently exacerbates this bias, especially if we own the airplane. It can lead us to skip areas or glance over areas during preflight and miss critical items.

Third, many flight instructors are somewhat derelict in teaching the importance of preflight. The "standard practice" is for the instructor to demonstrate a preflight inspection and maybe observe the student conduct one. From that point on, the instructor will generally say something like, "Go ahead and preflight the airplane on your own." The instructor arrives after the preflight is complete and off they go flying. In a way, the instructor is sending the message "Flying is important, so I will observe you when we fly together, but preflight is easy and simple, so I don't need to observe you doing that."

Fundamentals of a Thorough Preflight

While there is no need for pilots to have the same level of knowledge as an aviation inspector or an A&P IA, having some mechanical knowledge is very beneficial. It does not take a lot of effort to learn how to identify defects and abnormalities in a preflight. Investing time in acquiring this knowledge and then unfailingly putting that knowledge to use before every flight contributes immensely to flight

Figure 4

safety. Here are some suggestions you can utilize as you follow the manufacturer's recommended checklists for aircraft preflight.

A good preflight starts as you approach the aircraft. Looking at the "big picture," take note of any abnormalities. Is the airplane sitting evenly on the ramp? Is there any obvious damage, e.g., from a ground vehicle that may have contacted the airplane? Are there leaks or puddles of fluid under the aircraft? A flat tire?

When inspecting aero structures, a basic understanding of how loads are carried through the airframe is helpful. Attach points for vertical and horizontal stabilizers, spar lines and landing gear attach points are some of the areas of the airframe that experience the highest stress. Most metal aircraft employ a monocoque construction. In this type of construction, the skin is an integral component to the strength of the structure (just as an egg derives strength from its shell). Any sign of deformation in the skin or of popped or loose rivets in a metal aircraft structure is cause to suspect an overstressed member and to conduct a deep investigation. For example, look at **Figure 1**. Would you want to fly an aircraft missing rivets on its wing spar line? While in this case the rivets are completely sheared, observing cracked paint around a rivet or black oxide lines emanating from a rivet may indicate that the rivet is loose and strength is compromised.

Composite structures present a visual inspection challenge because they may be compromised without showing any external signs of damage. The only sign something is amiss in the empennage is a slight wrinkly in the paint in **Figure 2.** A "coin tap" test can indicate the health of a composite structure. By tapping the surface with a coin and listening for the resulting sound we can detect damage to the underlying composite structure. A localized change in stiffness, for example, due to delamination, will be indicated by a flattening tone from the coin tap.

Areas that carry high load should also be carefully inspected for cracks. Cracks usually emanate away from a stress point. They may initially present as small hairline blemishes and propagate and enlarge over time. The Pilatus PC-12 flap drive arm picture in **Figure 3** caused the flaps to fail as the pilot deployed them on approach to landing.

Likewise, having a basic understanding of aircraft hardware – nuts, bolts, rod ends, etc. – is helpful. Generally speaking, aircraft employ hardware that utilizes some safety retention mechanism such as lock washers, lock nuts, cotter pins and safety wire. Sometimes, mechanics will use torque seal paint to mark the alignment of the nut with respect to the bolt after proper torquing. This makes it easier to detect any loosening of the hardware over time. Inspect safety wire for tension and proper installation. The safety wire should be installed in a direction that prevents the nut from loosening and is sometimes installed incorrectly. Never underestimate the importance of fasteners and treat even one missing fastener as requiring attention prior to flight. Just three missing cowl screws caused the engine cowl on a Citation to depart the aircraft in flight (**Figure 4**).


Figure 5

Corrosion, which is the oxidation of metal, may lead to significant loss of structural strength. Water from precipitation or from washing the aircraft, exposure to moisture in the atmosphere and exposure to deicing fluid can inflict insidious damage on the airframe. There are many kinds of corrosion, such as surface corrosion (observable as pitting of the surface), filiform corrosion (which appears as "worms" under paint), pitting corrosion (which shows as white or gray powder deposit), and others. Corrosion will normally manifest as visible imperfections on the surface. **Figure 5** shows a trim tab rod end on a Hawker. A trace of red rust

led the pilot to further investigate, preventing a possible control surface jam in flight. Pay specific attention to areas prone to corrosion: external skin areas, wheel wells, landing gear, wing flaps, spoiler recesses, battery compartments, and areas near lavatories and galleys. Related to corrosion is atmospheric degradation of polymers, such as those used in aircraft hoses and seals. Those will be evident by stiffness and cracking of the rubber and, left unchecked, as leaks.

Chafing is another cause of failure that, in many cases, can be detected early. Last year, an aircraft at my home field had to land on its nose due to a nose gear malfunction. A prop strike ensued. The culprit was an improperly long screw installed on a gear door, which jammed a component of the nose wheel. Long scratches on that component indicated that the interference existed over several flights. Chafing will show as scratches or wear on moving components such as landing gear and flaps. Chafing may also be a result of components that contact each other due to aircraft vibrations. **Figure 6** shows a broken aspirator high-pressure tube that a pilot found while inspecting the environmental control system in his Citation. Flying with the line broken would have resulted in pressurization issues.

If the engine cowl or inspection covers to the APU, ECS, etc., can be opened easily, it is a good idea to open those as part of a thorough preflight inspection. Look for leaks and loose components. In a turbine engine, inspect the bleed lines for looseness and cracks. In a reciprocating engine, pay particular attention to the exhaust system and the turbochargers (if equipped), as those are subject to high temperature and stress. Exhaust leaks will show as white streaks near joints or cracks in the system.

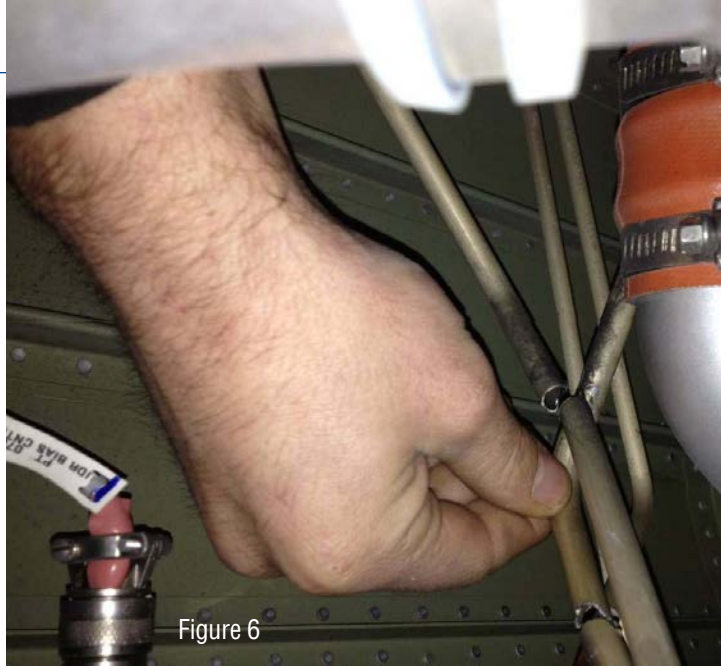


Figure 6

Preflight an Aircraft Post-Maintenance

The other week I was at the shop and observed a customer arriving to pick up their high-performance turbine aircraft after an annual maintenance event. The pilot loaded up

his wife and dog into the aircraft, climbed aboard, and off they went. After all, the repair station mechanics already checked the aircraft when they released it back to the line, didn't they?

The recent fatal crash of a 2012 Piper Meridian on a post-maintenance flight in Olathe, Kansas, reminds us that post-maintenance flights are a serious matter. A thorough preflight inspection is in order anytime the aircraft has been out of your care, especially after any maintenance event. While the scope of such an inspection will be covered in another article, at the minimum, it should include the following:

- A review of the work performed, including a review of airworthiness paperwork. Going on a test flight in an aircraft lacking completed airworthiness paperwork may lack valid insurance coverage.
- Your visual inspection of the areas worked, preferably before the shop closes those areas. Look for rags and tools that may have been left behind. Examine fastener and components for security, to uncover cases where a mechanic hand tightened a component and forgot to torque it to spec.
- Conducting a thorough preflight inspection, with an emphasis on security of access panels and anything that may have been left behind, and on critical components such as control surfaces and powerplant.
- Conducting a ground run.
- Conducting a test flight. Naturally, the test flight should be performed in good VFR weather. In many aircraft, the maintenance manual will call for a post-maintenance test protocol.

Closing Words

A good way to become more familiar with what to look for during a visual inspection is to spend some time with the inspector or IA at your repair station as they inspect your aircraft during a maintenance event. In most cases, they will be happy to share their knowledge.

Conduct a thorough preflight every time. Expect to find something wrong! By approaching our aircraft with open eyes and a extreme vigilance prior to every flight, we can further reduce the risk of a mechanical failure that may lead to an incident or accident. T&T

Brian Sagi *is an airline transport pilot and CFI. He teaches advanced flight and transition training at Enhanced Flight Instruction in San Diego (eflightinstruction.com). An experienced engineer, Brian also holds an A&P certificate with an Inspection Authorization. Contact Brian at* **brian@eflightinstruction.com**

The First Few Minutes

by **Thomas P. Turner**

You don't know for certain how well you or the airplane will perform until you've already committed yourself to flight. You have to bring your A game to even the first few minutes.

From an NTSB final report:

The pilot and two passengers departed in the multi-engine airplane from a controlled airport under night, marginal visual flight rules conditions. Radar showed the airplane climb to about 2,200 feet mean sea level (MSL). When the airplane was about three nautical miles (nm) from the airport, it began a descending left turn, followed by a right turn, losing about 700 feet of altitude during this time.

The airplane then began a climbing left turn. The left turn continued while its radius decreased until the end of the recorded data. During the final left turn, the airplane initially climbed about 400 feet, descended about 400 feet, and then climbed again about 1,300 feet before reaching its peak altitude of 2,800 feet MSL. The final recorded radar point was 0.1 nm from the accident site, and the calculated descent rate between the final two radar points was more than 5,000 feet per minute.

Postaccident examinations of the airframe, engines, and propellers revealed no evidence of mechanical malfunctions or failures that would have precluded normal operation. The airplane's avionics and instruments could not be functionally tested due to the extent of the impact damage.

The recorded weather conditions at the destination airport, located about six miles from the accident site, at the time of the accident included a broken ceiling at 1,000 feet above ground level (AGL), an overcast ceiling at 1,700 ft AGL, and visibility of six miles with mist. The radar data indicated that the airplane penetrated the cloud layers during the accident flight. The pilot held the appropriate certificates and ratings for operation of the multiengine airplane in instrument conditions but no clearance had been issued. The weather and light conditions at the time of the accident were conducive to the development of spatial disorientation. Further, the flightpath, which was not consistent with the intended course; the airplane's repeated climbs and descents; and the loss of airplane control and high-speed impact were consistent with the known effects of spatial disorientation. Based on this evidence, it is likely that the pilot experienced spatial disorientation after the airplane entered the clouds at night, which led to his failure to maintain airplane control.

The National Transportation Safety Board determines the probable cause of this accident to be: The pilot's loss of airplane control due to spatial disorientation while operating in night, instrument meteorological conditions.

This is (Not) Only a Test

It's easy to dismiss this triple-fatality tragedy as a "VFR into IMC" loss of control, tell yourself "I'd never do that," and move on. In part that's true, but this crash – and many more like it, often flown by highly qualified pilots – points to another high-risk activity: the first few minutes of flight. Especially if it is your first flight of the day or the first flight of the day in a particular aircraft. The first moments of a flight are a test for both you and the machine.

Are you at your A game, that is, doing your very best from the beginning? Or do you need a few minutes to get back into your groove? Will the airplane perform perfectly, or is there a discrepancy that won't become obvious until the airplane is in the air? You won't know for certain until you take off. It's a test, but it's not only a test. You and your passengers must live with how you and the airplane fly before you've had time to catch up or to prove the airplane's systems and equipment are set and working correctly.

Risk and Scrutiny

Any flight requires a serious evaluation of risk and detailed scrutiny. But unlike physical activity, playing a musical instrument or even public speaking, we don't really have a "warm-up" period before we begin a flight. We can inspect the airplane meticulously in preflight and follow Before Takeoff checklists precisely. But some mechanical and software-driven things don't reveal their true working nature until fired up and in flight.

So what can we do? Unless you are extremely current and the airplane is regularly flown, think hard before launching into instrument conditions or at night (and certainly into a combination of the two). Regulations and tradition have us gauge our proficiency based on arrivals – the number of landings in the previous 90 days for carrying passengers, the number of approaches for flying under IFR. Perhaps we should have another column in our logbook to track actual and simulated instrument departures. Unless a pilot has logged a departure (or six) into instrument conditions in the previous six months, actual or simulated, then that pilot might limit themselves to marginal VFR conditions for departure in the daytime or full visual meteorological conditions at night until resetting that currency counter. It's as vital to proficiency as counting approaches, in my opinion.

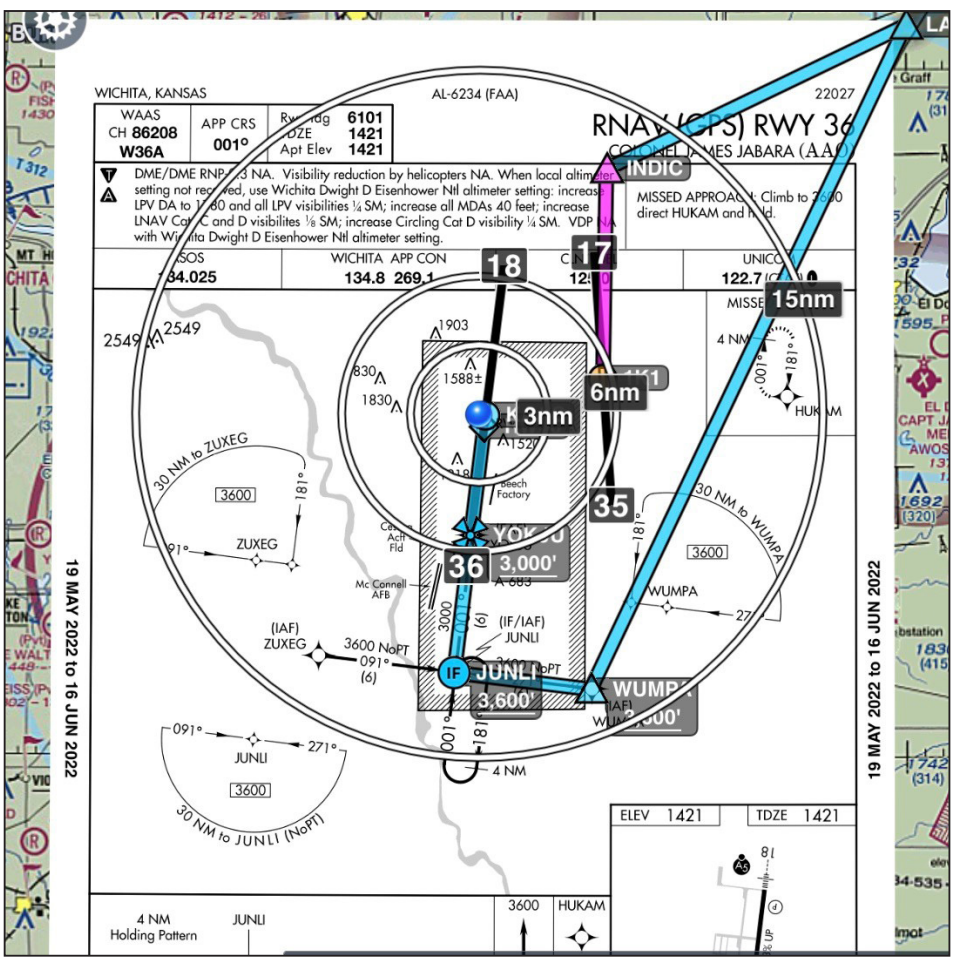
It's unlikely 14 CFR 61.57 will be updated to include such a requirement, and no doubt the "alphabet organizations" would fight it if FAA tried. But it's not a bad idea as a personal minimum to help cover for the fact we (or the airplane) may need just a little time to show our true capability as it exists in the first few minutes of flight.

Stack the Deck

You can do a lot to make the first few minutes easier and safer. Here's one example:

Recently returning from a trip, I had to land at an airport about five miles from my home field, both nontowered airports in the Wichita Approach Control area. My primary airport was closed for runway repair, and I had positioned a car and arranged hangar space at the alternate until it reopened. We had an extended period of rainy weather and after four days it improved enough to move the airplane but still required I file and fly IFR and fly an approach. The weather was "few clouds" at 600, 1,000 overcast, visibility three miles.

A common tactic would simply be to file direct to my nearby destination. Heck, around here I could call Approach without even filing and get a local clearance for vectors. But taking off to the north, vectoring 180 degrees to a very nearby initial approach fix and then almost



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immediately flying the procedure is a very high workload event – and it was my first flight in several days. I decided to stack the deck in my favor.

First, I filed an IFR flight plan from my destination airport to a fix about nine miles due north. From there, my flight plan went northeast about 15 miles to LASKI, another charted waypoint designed to give me plenty of time to turn around and head to the IAF for the approach. Since my destination is nontowered this should moot the ATC question, "Which approach do you request?" The entire route was about 73 nautical miles, and the flight would take 29 minutes, which seems excessive to move five miles laterally. But it saved the rapid-fire transition from takeoff to approach that would test me even if it wasn't the first flight I'd made in several days.

Next, I did not make the hop first thing in the morning. I waited until about noon to see if conditions might improve and also to see if any PIREPs for low-level turbulence were issued. Surface winds were in the high 20s, not unusual for Kansas but on the threshold of releasing moderate or greater turbulence close to the ground. A little delay also let me better evaluate whether I was up to the flight. I'd had a bad cold about a week before, and I didn't want any relapse to dizziness to show up in the air.

Before starting the engine, I thoroughly briefed the approach, including marking up the approach chart and making a "cheat sheet" of the items I needed to know from the final approach fix inbound and sticking it to my control wheel. I telephoned the ASOS at destination and got the airport information. Before takeoff, I uploaded my route, loaded the approach into the GPS, and set the minimums bug on the glass cockpit display. I preloaded the approach chart in the multifunction display and had it overlaid on the chart on my iPad.

Everything was in its place. I would need to do very little besides fly, move the heading bug, and switch radio frequencies between takeoff and landing.

All that preparation came in handy when the autopilot tripped off repeatedly on my short, solid-IMC hop and I had to hand-fly the entire flight.

First Flight of the Day

We don't see this much in light airplanes, but some flight manuals identify checklist steps that must be done prior to every flight and others that need to be done only before the first flight of the day. A good example is the flaps check in the Pilot's Operating Handbooks of the piston Beechcraft models I frequently fly. They call for running the flaps through all positions to check the flap motor stops when the flaps reach the full down position. Also that the flaps (and motor) stop in the Approach position both when running the flaps down (from fully up) and when retracting the flaps (from fully down). I consider this a "first flight of the day" check and will skip this step when running the Before Takeoff checklist on subsequent flights. Another common first-flight-of-the-day item is cycling the propeller during engine runup. Other checks, such as controls free and correct, electric trim check (in case it triggers a runaway) and magneto check (to detect fouled or failed spark plugs), must be done before every flight.

Just as your preflight walkaround inspection before the first flight of the day is undoubtedly more complex and takes more time than your walkaround after a quick fuel stop during a day of flying, you may be able to cull some Before Takeoff system checks from the items you perform at the beginning of the second or third leg of a full day of flying.

Subsequent Flights

The hazard of doing this is complacency. Don't rush through the checklists before you board or during the Before Takeoff checks. Take a look at your checklists and decide if there are any steps you don't have to do before every single flight. If you eliminate any steps, do so not because they take time, but only if they are items that aren't critical. You might highlight the Every Flight items or even make a second abbreviated checklist for takeoffs after the day's first flight is complete. Still, use these amended checklists.

One last thing: If you make more than two flights in a single day, I suggest performing the full, first-flight checklists on subsequent flights. I especially recommend this if the later flight occurs at night. In part, this might catch something that has broken during the busy day. It also reflects the different settings of some items in darkness compared to when operating in daylight. Mainly, though, I suggest this to help slow you down and pace yourself, compensating somewhat for accumulated fatigue.

Bring Your A Game

The NTSB Probable Cause statement for the piston-twin accident that opened this article may suggest otherwise, but we don't know for sure what may have contributed to the fatal loss of control. What we do know is that the theorized pilot-induced loss of control, or some undetected instrument or systems failure, or both, happened in the first few minutes of the flight.

You don't know for certain how well you or the airplane will perform until you've already committed yourself to flight. You have to bring your A game to even the first few minutes. What warm-up we get is in mental preparation and physical workload reduction techniques completed before advancing power for takeoff, backed up by careful completion of systems and operational checklists. 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.**

Dynamic Aviation

by **Lance Phillips**

Stoltzfus Dusting Fleet

Chris Stoltzfus

When one owns the first Air Force One aircraft, you know something special is happening. That's the way it is for the Stoltzfus family – special. Originally from the rolling hills of southeast Pennsylvania where family patriarch Christian "Airplane Chris" D. Stoltzfus staked a claim, this is a family whose aviation credentials go way back – back to the beginning of our industry in the United States.

Chris purchased his first airplane, a 37 HP Aeronca C-2, in 1936. He added J-3 Cubs and then entered the agricultural aviation business in 1944 with a Travel Air 4000 duster, which he operated until 1952. In 1947 he had broken a rod on the Wright J-5 engine of the Travel Air and made a forced landing in a nearby field. The Wright was replaced with a Continental W-670 at that time.

Also in 1947, Chris acquired 12 government surplus Boeing Stearmans, which were soon joined by other airplanes, all becoming the backbone of his agricultural aircraft fleet for many years. He operated as AERO CROP SERVICE in those days. By the late 1950's the ever-evolving business saw advantages to replacing the 220-horsepower Continental and Lycoming engines with 450-horsepower Pratt & Whitney radials for its forest spraying.

Chris was in the aircraft parts business, alongside the agricultural operation. The company name was changed to Chris D. Stoltzfus & Associates in 1958 when his twin sons Karl and Ken became partners. The Stearmans were followed by Beechcraft BE-18s, Grumman TBM Avengers, Douglas C-47s, Chase YC-122s "Boxcars," and a Boeing B-17, which later became EAA's "Aluminum Overcast."

The old Travel Air 4000 mentioned previously, N469N, had 1,755 hours when Chris sold it to another agricultural aviator in Conway, Arkansas. In 1976 that same airplane was restored with the original Wright engine and brought back to standard category designation. Finally, in 2013 N469N was purchased by Chris' son Karl in Bridgewater, Virginia and put on display, along with the Continental W670 that Chris had installed in '47.

Around the age of 10, Karl Stoltzfus liked to go to the attic of his family's Coatesville, Pennsylvania home with a

Today, Dynamic Aviation employs more than 650 people, owns over 140 aircraft, and operates from 18 locations.

scale model tucked under his arm. Once in the attic, his imagination could fully take over and he would "fly" the Beechcraft 18 twin-propeller airplane, doing loops and swoops all around the confined space. Little did he know that 70 years later he would be slicing through the skies in a true Beechcraft Model 18. "He flew a Beech 18 on his 80th birthday, and he probably bought and sold over 30 Beech 18's throughout 50 years," said Michael Stoltzfus, one of Karl's sons. "Dad always, through to the end, had a deep, powerful passion for aviation."

In 1967, Karl and Ken packed up their families and moved to the Shenandoah Valley to attend Eastern Mennonite College from which Karl graduated with a bachelor's degree in business. To finance their education, Karl and Ken founded K & K Aircraft Inc., a small aircraft parts business and aluminum smelting operation. They also founded Avotek, a manufacturer of technical training aids for vocational-technical schools. Karl's son Karl Jr. now owns and operates Avotek.

In 1973, Ken moved to Ohio to pursue a full-time role as a pastor. Two years later, Karl and his wife Barbara purchased Bridgewater Airpark and shortly after that moved K & K Aircraft and Avotek to the airport. In 1981 Karl began building a fleet of Beechcraft BE-18s, and Douglas DC-3s for wide-area aerial application missions.

As an avid pilot, Karl was passionate about all things aviation. His depth of knowledge regarding aircraft parts, maintenance, and modifications was unparalleled. He bought and sold many aircraft throughout the years, including the purchase of 124 non-pressurized King Air 90 aircraft from the U.S. Army in 1996, enabling K&K to broaden its scope of operations significantly. In 1997, K & K Aircraft became Dynamic Aviation and Karl's son Michael became a partner in the business.

By the late 1990s, Dynamic Aviation expanded into supporting fire management customers with King Air lead planes. In addition, the business entered the airborne data acquisition (ADA) market by providing ADA services to government and commercial customers in over 30 countries.

Karl Stoltzfus

Michael Stoltzfus

2004 saw Dynamic outfitting its first aircraft for intelligence, surveillance and reconnaissance (ISR) missions, paving the way for its current reputation as a leader in that competitive market.

Through all the success and innovative initiatives, Karl was a voracious reader of both aviation and history, and he loved sharing what he learned with everyone he met. Karl demonstrated integrity and honesty and taught people to do the right thing and do it well. He received the Virginia Department of Aviation's Lifetime Achievement Award and was inducted into the Virginia Aviation Hall of Fame. He left us in 2020 after 80 years of service to his family and the aviation industry. Karl is survived by his wife Barbara and children, Karl Jr., Michelle and Michael.

U.S. Army King Air 90's.

Before departing the pattern, Karl oversaw the purchase of the first Air Force One and led its restoration. From Brittanica.com: *President Eisenhower's first personal transport, starting in 1953, was a customized C-121, the military version of the Lockheed Constellation airliner. Designated VC-121E, it was christened the Columbine II – the columbine being the official flower of Colorado, the adopted home state of Mamie Eisenhower. (The Columbine I had been Dwight D. Eisenhower's personal transport when he was a general in the army.) The call sign Air Force One was created by Gen Eisenhower's pilot, Col Draper, as a result of a flight to Florida, when he was concerned that air traffic controllers might confuse the presidential plane's call sign, Air Force 8610, with a similar call sign of a nearby commercial airliner.*

Columbine II was replaced as the primary presidential plane in 1954 by Columbine III, a modified Super Constellation. Columbine II, the first Air Force One, now sits proudly in Bridgewater, Virginia, at Dynamic Aviation's facility.

Today, Dynamic Aviation employs more than 650 enthusiastic aviators, owns over 140 aircraft, and operates from 18 locations in 11 countries across five continents. In 2020 the company announced plans to invest $47.9 million to expand its operation in Rockingham County in partnership with the Virginia Economic Development Partnership and the Virginia Jobs Investment Program. The employees at Dynamic Aviation will tell you this about their company: *We are a band of brothers, sisters, and friends who stay reconciled, care for one another and live out our shared values, interests, and objectives together. Many of us are motorheads. We enjoy airplanes and all things mechanical. We like being in the environment and supporting, working on, and operating airplanes. We love to serve. We love saving and protecting lives, property, and the environment – and inspiring the next generation. We are motivated by knowing that what we do everyday matters. Our values are ownership, unity, the golden rule, urgency, and doing the right thing. We solve big problems with airplanes. We save and protect lives, property, and the environment; and we inspire the world.*

If you take a quick look at the Dynamic Aviation website, you'll find the following vast fleet lineup: 124 Beechcraft King Airs, 15 De Havilland Dash-8s, four Boeing 737s, and a fleet of 10 vintage aircraft, including "Miss Virginia," the most pristine DC-3 in the world, and the aforementioned first Air Force One.

Karl's son Michael Stoltzfus now owns Dynamic Aviation and has been its president and CEO since 2006. He has founded, co-founded, operated and co-created multiple businesses primarily in the aerospace and defense industry. Michael joined Dynamic Aviation in 1990 and has held various roles in flight operations and business development throughout his tenure. He holds an airline transport pilot rating, multiple type ratings (including the DC-3 and the Super DC-3), and has flown over 6,000 hours in over 10 countries. He is an active member of the Young Presidents Organization and Tiger 21 and has served on the boards and advisory councils of multiple non-profit organizations. Michael attended Eastern Mennonite University and is an alumnus of Harvard Business School, through which he has completed multiple executive education programs, including HBS's Owner-President Management course.

In the last couple of years, Michael, like many others, saw a need to bring young, enthusiastic aviation professionals into our industry. So, he developed a new program called NEXTGEN Aviators. Taking place at local airports, it introduces, informs, ignites, and inspires young adults about the world of the technical aviation workforce. Michael describes the program, "When you bring your students to a NEXTGEN Aviators event, they perform hands-on activities based on real-life applications. As we guide them through a series of experiences encompassing several aviation careers, students are intrigued by engineering and design. Some are fascinated by metalworking or electronics. The art of aeronautics will engage others as they fly the simulator or experience the exhilaration of flight for the first time."

From "Airplane Chris" innovating in small-town Pennsylvania to Karl building a legacy in Virginia, we can only imagine where Michael is going to take the Stoltzfus family's birthright. He has already taken Dynamic Aviation to places his dad and granddad never even dreamed of, and now his team is enriching the whole industry by awakening a new interest in aviation within young kids. We wish Dynamic Aviation, NEXTGEN Aviators and the Stoltzfus family continued success. T&T

Lance Phillips *is an aviation professional, writer, pilot and photographer. He is executive director for the Pinnacle Air Network and owns Phillips Aero Services, an aviation marketing services provider. You can contact Lance at* **lance@phillipsaeroservices.com.**

by **Kevin R. Dingman**

Memory Joggers

When I was younger, I could remember anything; whether it happened or not.
– Mark Twain

I used to be able to remember four or five parts of a long ATC transmission: "Citation N797VS, right to zero-six-zero intercept the localizer, maintain four till established, cleared the ILS-PRM-Yankee one-zero right, maintain 170 knots till KVENN, tower at GOOZY 133.0." Now, because of years of listening to ATC, my readback is mostly knowing the order of the information presented and simply filling in the blanks rather than remembering the whole string of information from scratch; similar to the order of data on the ATIS or the initial route clearance from clearance delivery. Another example would be the format of holding instructions: "Duke N7510D cleared direct WATSN, hold East as published except 10-mile legs, maintain one four thousand, expect further clearance at 1435 Zulu, time now 1410." Other transmissions from ATC are similarly predictable: taxi instructions with hold short or cleared to cross, and a takeoff clearance with the winds, a heading or climb via the SID, and cleared for takeoff. But many of the things we must remember to fly the airplane require good old-fashioned memorization.

Memory! Memory! My kingdom for better memory!
– William Shakespeare (modified)

Memory is the retention of information over time, even if only for a short time – such as in the above ATC examples. According to the Mayo Foundation for Medical Education and Research (MFMER – that's an initialism, not a mnemonic), these seven things can help in retaining information:

1. Include physical activity in your daily routine.
Physical activity increases blood flow to our brain. This can be problematic for a professional pilot due to schedules and living on the road.

2. Stay mentally active.
Mentally stimulating activities help keep the brain in shape. I think we pilots have this one covered.

3. Socialize regularly.
Social interaction will help decrease depression and stress. Many of us interact with passengers, FBO's and fellow aviators, so we probably have this one covered too.

4. Get organized.
If your home is cluttered and your notes are in disarray, confusion and frustration can result. Pilots are pretty organized – often to the point of being called control freaks. Those living with us, maybe not so much.

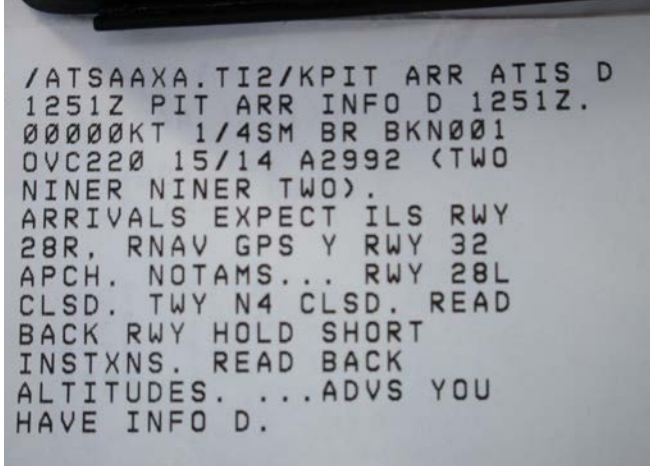
5. Sleep well.
Sleep plays an important role in consolidating memories. Once accustomed to living on the road, this is manageable.

6. Eat a healthy diet.
Diet is likely as good for your brain as it is for your heart. Traversing multiple time zones and finding healthy food on the road is likely our most challenging impediment to healthy living.

7. Manage chronic conditions.
Depression, high blood pressure, high cholesterol, diabetes, obesity and hearing loss should be properly managed. The need to maintain our First, Second or Third class physical forces us to comply with this recommendation.

Youth is wasted on the young.
– George Bernard Shaw

Whether you fly wearing a suit and tie, jeans and Docksiders or tights and a red cape, aviation demands both mental and physical proficiency. And it's our job to minimize mistakes and the times in which we skip or forget things or



The format on the ATIS is easy to remember.

You can use the visual mnemonic of your hand/thumb to remember holding pattern entries.

accomplish them out of order. The frequency of mental lapses increases as the first digit of our age changes from four to five, then from five to six and then to seven. Certainly, by the time the first digit reaches eight and nine, even super pilots in tights and a red cape can expect diminished capacity. In order to help remember a clearance, some pilots like to set the clearance items as they hear them. They have the direct-to page called up on the FMS and select the point but wait to activate it. Or they load the cleared-to altitude in the altitude pre-select window, set a com frequency in the standby box, the squawk code in the transponder, and they write down everything else. I'm a write-it-all-down first, read it back, then enter the data and execute it kind of guy. Not only do I recognize that my tights and cape are retired and my memory capacity has diminished, but it seems that ATC communications contain a higher number of critical items. The paths which we fly and taxi are less tolerant of deviation. Climb and descend via procedures, RVSM, PRM and CAT II/III approaches, land and hold short (LAHSO) and SMGCS low visibility taxi procedures are prime examples. Mnemonics and litanies are not simply crutches; they are useful checklist supplements.

The study and development of systems for improving and assisting memory is called mnemonics.

A study in 1967 by Gerald R. Miller revealed that students using mnemonics increased test scores up to 77 percent – statistically impressive. Here are some common phrases, rhymes and spelling mnemonics: Thirty days has September, April, June and November; the alphabet song; In 1492 Columbus sailed the ocean blue; red sky at night, sailors delight; and i before e, except after c. And for remembering the mountains from North to South in the Cascade Range, use BRASH: Baker, Rainier, Adams, Saint Helen and Hood.

We have a ba-trillion mnemonics in aviation. Here are some samples followed by a discussion on litanies:

- *Spelling mnemonics:* GUMP: Gas, Undercarriage, Mixture, Props. ARROW: Airworthiness, Registration, Radio license, Operating Limitations, Weight & Balance.
- *Feature mnemonics:* Dashed and solid lines for hold short. Dashed lines are skid marks on the "fast" or "movement" side of the hold-short line.
- *Rhyming mnemonics:* flying from an area of high pressure to one of low pressure – high to low, look out below. White over red, your dead for VASI/PAPI. East is least, west is best for true vs. magnetic corrections.
- *Note/phrase mnemonics:* Maintain thine airspeed, lest the ground arise and smite thee. Dead foot, dead engine. Identify, verify, feather, secure. Aviate, navigate, communicate.
- *Alliteration mnemonics:* In an emergency: Climb, Communicate, Comply. Or during an approach: Time, Turn, Twist, Throttle, Talk.
- *Song mnemonics:* I could not remember a single aviation song mnemonic – mail me one!
- *Organization mnemonics:* FAA, EAA, AOPA, NBAA and TFR.
- *Visual mnemonics:* L or R hand, fingers and thumb for visualizing holding pattern entries.

Litanies

One definition describes litany as a long and tedious address or recital. A litany is also the act of delivering formal

spoken communication. Even when solo, we may verbalize a litany out loud to ensure emphasis and accuracy. In fighters, we would verbalize bombing parameters when flying a "pop-up" bombing profile. Some pilots like to verbalize speed and configuration changes from downwind to base and final. In a time-critical situation, we perform the memorized litany items first, sometimes using additional mnemonics, and then accomplish follow-on actions from a checklist. Each sector of aviation and individual aircraft has its own litanies. In most turbine aircraft, there is a litany for each type of takeoff and go-around: normal takeoff, engine failure on takeoff, multi-engine go-around, and single-engine go-around.

And certainly, there are litanies for a rejected takeoff (abort) before V1. We think more clearly when we are not all hot and bothered. So, how fast do we need to complete the expanded checklist after we have accomplished any memory items, litanies and mnemonics? How long will the other one(s) keep running if an engine quits? Likely, all day long. If we have a configuration issue, whether flight controls or landing gear, the time remaining to deal with the issue is probably a direct function of fuel remaining and weather. If the abnormal situation is electrical or hydraulic in nature, your life may become more complicated due to the risk of fire or potential loss of other systems like navigation, attitude control or braking and stopping/slowing ability.

> Everyone complains of his memory, and nobody complains of his judgment.
>
> – Francois de La Rochefoucauld

Rushing, distractions, loss of SA (situational awareness) and fatigue are common excuses for not following procedures. Many would add complacency and forgetfulness to the list as well. When we become comfortable in a particular vehicle, we may rush or skip through a checklist. But consider this: It has been shown that those who deviate from procedures and checklists are three times more likely to commit errors with consequential results. I don't know about you, but I don't need any consequential results with any added level of consequential grief in my airplane. We all need to use good judgment, checklists, litanies and mnemonics in order to avoid relying solely on our memory. Just be careful and don't confuse GUMP with BRASH or your engine failure litany with the alphabet song. T&T

Kevin Dingman *has been flying for more than 40 years. He's an ATP typed in the B737, DC9 and CE-650 with 25,000 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 retired from a major airline, flies the Cessna Citation for RAI Jets, and owns and operates a Beechcraft Duke.Contact Kevin at* **dinger10d@gmail.com**.

Fitness for Flight

PHOTO COURTESY OF JIM RAEDER

Ryan DeLuca of Eagle, Idaho, a suburb of Boise, has been flying since 2005. The tech entrepreneur and father of four had not grown up interested in flying or wanting to be a pilot but rather began flight training later in life as a hobby.

DeLuca primarily utilizes his 2009 Pilatus PC-12 NG for business and personal flights with his family, as well as flights conducted for charitable organizations. He flies the aircraft single pilot with a footprint predominantly in the western half of the United States. That said, he has stretched the airplane's nearly 1,600 nautical mile capable legs further outside of that region, having flown to Florida and other destinations east of the Rockies.

"I decided to make the big step to the PC-12 in 2012," DeLuca said. He explained his rationale for the transition, which is similar to many others who grow out of their previous aircraft – in his case, a 2007 Cirrus SR22 Turbo.

"The problem with these four-seater planes is that there are always more people that want to go with you than you can carry. Because of this, I decided to take the step up. At first, I was thinking about getting a six-seat Piper Meridian or similar aircraft, but a friend of mine said, 'If you are going to [eventually] get the PC-12, you might as well go for it. You might as well skip that step.'"

To help ease the transition from unpressurized fixed-gear operations into the 10,450-pound complex, single-engine turboprop, DeLuca completed 50 hours of simulator training at SIMCOM. He recounted some initial standout differences between his new bird and others he had previously flown or owned.

Ryan DeLuca

"I'm a computer guy, so the avionics weren't too tough, especially coming from the Cirrus. It's a different system [Honeywell Primus Apex] than others I've flown, but once you know one of the avionics systems, they are all kind of the same. Things are in different places, but the basic idea of what is possible and what type of data is all the same. I would say the hardest thing about the training was flying a bigger plane. Comparatively, a Cirrus

A flying mission for Angel Flight West.

is almost like a wingsuit attached to you, a sports car, and can take tiny little stick movements, whereas the PC-12 is more like an SUV. So, it took some time to get used to the less immediate feel of flying it."

Other aspects contributed to the challenges of learning a new aircraft as well. "I think the other thing is the speed. Things just happen more quickly, so you have to be ready for that. And then, of course, additional features such as the retractable landing gear and other systems. I want to say that I am so smart for figuring this aircraft out, but really, this is an easy plane to fly as there is so much less to worry about in some ways than even a Cessna 182."

After completing the formalized training with nearly 800 total hours under his belt, the instrument-rated pilot felt confident to begin utilizing his Pilatus flying skills in the real world. Today, he flies approximately 150 hours a year to a variety of airports.

"It's a great mix what the PC-12 is capable of. Being here in Boise it's great for going up in the mountains and doing quick weekend trips with the family. We like to jump into the airplane on a Friday afternoon. From here, it's only about a two-and-a-half-hour trip to anywhere in the western half of the United States: San Diego (645 nm), Phoenix (640 nm), Napa (420 nm), Seattle (345 nm), or Denver (565 nm)." On trips, he sees an average cruise speed of 260 knots and roughly 360 pound per hour fuel flow.

DeLuca also routinely flies to other more limiting locations in terms of density altitude. "The aircraft's performance is amazing. The crazy thing is that I almost feel like the PC-12 is almost cheating. It's single pilot, there is so much automation, and you can carry a lot of weight. It's hard to get the plane overweight during my typical mission."

When the combination of payload, temperature, altitude and runway length become more of a potential concern, the aircraft does a good job at handling hot and high demands.

"Going into the mountains on warmer days, those are the times you want to double-check your performance. And on short runways, it's easy to take off and land in this plane. You can get really slow up there in the mountains, but the aircraft still performs really well even in those conditions. Like I said, I almost feel like it's cheating flying the PC-12 because it is such a high-performance aircraft that can carry a lot of weight and go a long way."

In addition to being a passionate aviator for nearly two decades, DeLuca is a longtime health advocate having founded Bodybuilding.com in 1999. Currently, he serves as CEO of fitness-based virtual reality startup Black Box VR, which he co-founded in 2016. The gamified fitness business has locations in three states: Idaho, Arizona, and California, with DeLuca routinely flying his PC-12 to visit these training centers.

With his own and others' health continually on his mind, he is quick to draw comparisons between flying and fitness. DeLuca contends that, as pilots, it is equally imperative that we maintain our bodies and fitness as it is that we maintain our aircraft.

"To be a great pilot, you have to be disciplined about your routine and your training. When you are flying the plane, you have to make sure that you are following appropriate procedures. And that is the same thing with workouts and diets. You can't just be consistent for a while and then not if you are trying to be in shape, fit, and feeling your best."

An additional thesis is if you feel good, you fly good.

"I think the other side is that being fit has been shown to help so much with your mental clarity, ability to focus and energy levels. There have been many times on long flights where I have been very thankful being in shape and being healthy has paid off so that I can complete those missions without getting tired or any health concerns. And the biggest thing is that I would like to fly for a long, long time. Now that I'm past 40 years old (44), I just completed my first two-year medical. You hear stories about people going in for their physicals then having a health problem come up and not being able to fly anymore. I'm trying to make that day as far into the future as possible." T&T

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Diversion Decision

On each and every flight, we make hundreds of decisions. Are we physically fit? How about the airplane? The weather? The list is endless. And we never, ever do everything perfectly.

Perhaps that is what keeps us flying.

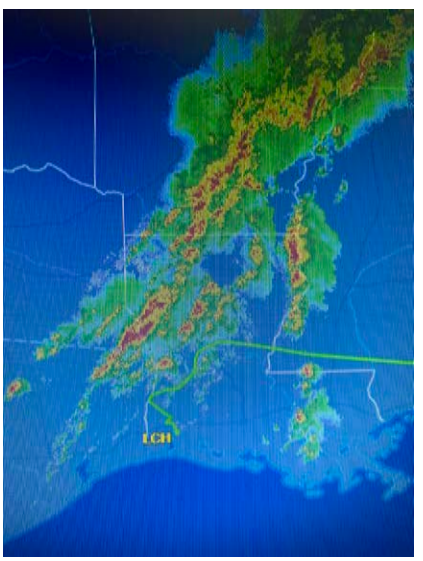
On a recent flight, I did a lot of things right. But not everything.

Patty and I were returning home from a lovely adventure to Turks and Caicos hosted by the fine folks at Air Journey. It was my first flight to the islands, so I opted to take along one of their safety pilots. We had a great time. On departure day, we flew the two-hour leg to Florida clearing customs at Ft. Pierce (KFPL). A nonstop return to Dallas was possible but an extensive line of convective activity stretching from east Texas northward made this unlikely.

As we ate lunch at the Ft. Pierce airport, I told Patty that we would stop in Panama City (KECP) to review the weather and fill up with fuel to have the reserves necessary to get home safely.

Score one good decision for me.

Climbing out of ECP, it was obvious that this flight was going to be a challenge. From the picture below, my plan was to deviate to the south of the line of thunderstorms to Waco, Texas and then north to Dallas. In the clear at FL400, we were well on top of everything as shown in the second picture. I planned a diversion option of KCWF to the south with no precipitation in their overcast 4,000-foot forecast.



But airplanes ahead were asking for higher altitudes up to FL420 to clear the line of weather. "Houston center, November three nine six delta mike is requesting wrong way flight level four one zero for weather," I asked. Another thousand feet might be all I needed to stay in the clear.

Score one for wishful thinking.

The tops increased slowly as we got closer to the frontal activity. The ride was smooth, with no ominous buildups ahead and no dark skies. I was not quite comfortable being so close to the tops but reasoned that we could safely proceed. As we continued, the clouds rose ever so slowly so that the airplane was in the clouds, but I could see the sunshine through the tops.

I squirmed in my seat.

A few seconds later, a flashing red master warning light with the message "Left Windshield Anti-Ice Fail." In itself, not a serious matter and no ice was visible on the windshield. Then, a few seconds later: "T2 HEATER FAIL"

This one was more serious. High altitude ice crystals were clogging the sensor that controls engine thrust. The Mustang's FADEC engine controls sensed the ice and automatically reduced engine thrust on both engines. Patty read the checklist for exiting icing conditions. To compound matters, my NEXRAD weather depiction, which I was using to plan my deviation, went blank.

The easiest decision was the next one. "Center, six delta mike would like to change our destination to KCWF." While I was task-saturated, Patty was rock solid, likely due to her CJP companion simulator training. She handled the checklist while I negotiated with Center for the diversion. Out came the speed brakes and we made a rapid descent and approach to an 800-foot overcast.

My decision to fly over the weather might have worked. But I didn't plan for everything.

Fly safe. T&T

David Miller *has owned and flown a variety of aircraft from light twins to midsize jets for more than 50 years. With 6,000 plus hours in his logbook, David is the Director of Programs and Safety Education for the Citation Jet Pilot's Safety Foundation. You can contact David at* **davidmiller1@sbcglobal.net**.

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