Paranoid Pilots Club

A few techniques from a charter member


JAMES ALBRIGHT

A pilot's last chance inspection before engine start.

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"Sometimes paranoia's just having all the facts."

— William S. Burroughs

Let me admit up front that I am paranoid about all things aviation. For some reason, I have no problem making assumptions and trusting others when away from airplanes, but the minute aviation is involved, I turn into another person. I know all of this because there are pilots who don't have the same level of mistrust and are only too eager to let me know that I have a serious trust problem.

As far as I can see, we pilots fit into two groups. Half of us are compelled to double-check things that have already been checked. We need to see technology safeguards in action under various circumstances to learn to start to relax. We hear about another pilot's misfortune and immediately think, "That could have been me!" And the other half? They are the ones not caring a whit until they are bitten by a mistake and have to resort to the lamest excuse of them all: "There are those who have and those who will."

Some of these mountains disguised as mole hills seem to be of such a random (or rare) occurrence that you are tempted to dismiss them as "one of those things." When someone more paranoid than you suggests a technique to avoid recurrence, your first reaction may be to dismiss the whole idea. "It will never happen again" may morph into "it hardly ever happens." Then one day, if you are the one bitten, it will suddenly hit you: "That was a pretty good idea after all."

So, here are a few examples of my paranoia and case studies where a little of that condition would have saved lives, or at the very least, would have spared the aircraft from significant damage. But good paranoia extends beyond specific case studies and techniques. If you learn to harness your inner paranoid pilot, you too can spot opportunities to prevent the next big mistake from biting you or your peers.

Paranoid About Fuel

In all my years of flying I have only twice felt unsure about having enough fuel to make it to Point B after thinking I had enough when leaving Point A. The first time was in an Air Force T-37B leaving McGuire Air Force Base, New Jersey for what used to be Loring Air Force Base, Maine. Air traffic control held us down at 6,000 ft. as our hungry J69 engines devoured what little fuel we had at twice our planned rate. The second time was in an Air Force Boeing 707 flying from Honolulu to Anchorage, Alaska (PANC). At the proverbial equal time point, one of our largest fuel tanks started to vent into the aft cabin and out the tail of the airplane.

In the first case, I was clearly an idiot for not declaring an emergency and reversing course. In the second, I was a victim of circumstance. We landed safely both times, but the lesson was

PORTUGAL ACCIDENT INVESTIGATION FINAL REPORT

Air Transat 236's cracked fuel pipe

the same: You need to worry about having enough gas from the moment the fuel truck arrives until the engines are shut down at your destination.

The captain of Air Transat Flight 236 back on Aug. 24, 2001, could have benefited from this kind of paranoia. While he is looked upon as a hero in some aviation circles, there is no escaping the conclusion of the Portugal Aircraft Accident Board: He failed to recognize a fuel leak situation and turned his Airbus into a glider.

The flight was scheduled to fly from Toronto-Pearson International Airport, Canada (CYYZ) to Lisboa-Portela de Sacavém Airport, Portugal (LPPT). The aircraft was loaded with 47.9 metric tons of fuel, including a 5.5-metric ton-reserve. But the crew ran out of gas and flew a flawless dead stick landing into Lajes Airport, Azores (LPLA).

This story is filled with complications, as these stories often are. It began with a right engine change a week prior to the incident flight, but the new engine was slightly modified and called for a post-modification hydraulic pump. Evidence indicates that since the new type of pump wasn't available, a screwdriver or other blunt instrument was used to wedge the existing pump's hydraulic lines into place with just barely adequate clearance from adjacent fuel lines. But these lines tend to flex once pressurized and they contacted and started to fatigue prematurely. About 4 hr. after takeoff, passing 30 deg. west longitude, the fuel line finally fractured.

The aircraft's warning system notified the crew that they had a fuel imbalance, with the left wing becoming too heavy. The crew ran the fuel imbalance checklist from memory by opening the crossflow valve, turning off the fuel pumps on the right side, and allowing the heavy left wing to feed the light right wing. Although they realized their total fuel was dropping below flight plan predictions, they did not consider the possibility of a fuel leak. Once the total fuel fell below that required to complete the flight to Portugal, they elected to divert to Lajes.

Since there was no external sign of a fuel loss from the wings, the crew continued to believe the warnings were false. It appears that the fuel leaking from the right engine was vaporizing into the engine's exhaust, unseen from the cabin. About 150 mi. from Lajes, the right engine flamed out, followed by the left engine when they still had 65 nm to go. The captain very ably glided the airplane to the runway, flew a 360-deg. turn to lose altitude, and crossed the threshold at 200 kt. The aircraft came to a stop 7,600 ft. down the 10,000-ft. runway. There were a few minor and serious injuries, but no fatalities.

The captain received the Air Line Pilots Association Superior Airmanship Award the next year. I agree that his airmanship following the loss of both engines was indeed superior. But I think his poor airmanship prior to the fuel imbalance caused the event in the first place. Had the crew referred to their fuel imbalance procedure, they would have been led to the fuel leak checklist. That checklist would have had them shut down the right engine and stopped the fuel leak. You may think that I am guilty of "Monday morning quarterbacking," but those are the facts as presented by the accident board.

Putting the question of blame aside, I think a simple technique can help you avoid a similar fate to this and other fuel shortage problems. All that is required is a ballpark estimate of how much fuel you need to start a flight, and how much you need to complete the flight at any point while aloft.

You should have an idea of how much fuel your airplane burns per hour on average. You may need to adjust the burn rate with the passing hours, but you should come up with a simple metric that can be easily memorized and applied. If the rule of thumb is too complicated, it is more likely to be forgotten or applied incorrectly.

In the Boeing 747-200s that I used to fly, we tended to burn an average of 26,000 lb. of fuel per hour. If we were flying a 5-hr. leg, for example, we needed at least 130,000 lb. This is fuel loading with the accuracy of a sledgehammer, but it is good enough to realize that 100,000 lb. of fuel in the tanks isn't enough. In my current aircraft, a Gulfstream G450, I plan on 4,000 lb. the first hour, 3,500 lb. the second, and 3,000 lb. from then on. Once again, I would never plan my fuel loads with such a crude estimate, but it helps me apply a reasonableness check.

I once fell into a common trap of those who fly the same trip, over and over. I was used to arriving at Teterboro Airport, New Jersey (KTEB), and asking for the minimum amount of fuel to waive handling fees. For my aircraft at our favorite FBO, that meant 560 gal., more than enough to make it home to Hanscom Field, Bedford, Massachusetts (KBED). One day we broke the pattern with a second leg to Mexico City. As the fuel truck driver gave me the "I'm done, are we done?" thumbs up, I looked at the fuel gauges and realized 10,000 lb. of total

ROLAND WINKLER

Gulfstream G450 N667HS

fuel wasn't enough to fly the 5-hr. trip ahead.

The technique can be extended to hourly checkpoints during flight. We often do this during oceanic flights when comparing total fuel to our master documents. Of course, we have more divert options when flying domestically, but the technique is equally valid. Flying from coast-to-coast in the U.S. with 3 hr. to go, an airplane that burns 3,000 lb. an hour with only 6,000 lb. on board will probably come up short

Paranoid About Gear Pins

When I was a new hire in a Gulfstream GV flight department, I retained my practice of always showing the other pilot the gear pins after I had pulled them. We had three pilots in the flight department and I was junior in seniority. The other two pilots said it was unnecessary to show the gear pins as "we" would never forget them. They allowed me to continue my practice but refused to join in. This went on for two years until they departed one day with the gear pins installed. To their credit, they ran the proper checklists, landed, pulled the pins, and continued.

You cannot pull the pins on a GV-series aircraft after attempting to raise the gear handle without running a checklist to reset the electronic gear selector valve. The gear handle on this airplane is nothing more than an electrical switch connected to a black box that controls the hydraulics. If the process is interrupted by forgotten gear pins, a checklist is needed to bring everything back in sync with the gear handle. It is definitely counterintuitive to any pilot used to a conventional landing gear system. But not every GV-series crew is sufficiently paranoid about this.

On April 11, 2017, the crew of Gulfstream G450 N667HS returned to land at Salzburg Airport, Austria (LOWS) after declaring a PAN. It appears the crew took off with the landing gear downlock pins installed, raised the gear handle to the UP position, and then returned the handle to the DOWN position, landed, and pulled the pins. On just about any other airplane, the story would have ended there. But because they failed to accomplish the checklist needed to reset the selector valve, things became complicated. After the pins were removed and hydraulic pressure reapplied when the pilots attempted to close the open gear doors, the landing gear retract circuits were

JAMES ALBRIGHT (2)

Gulfstream G450 gear pins in their storage block.

Gulfstream gear pin holder installed between the gustlock and flap handles.

activated. The nose landing gear retracted, causing the nose to fall on to the pavement. Since the main landing gear had a higher proportion of weight and a different mechanical downlock system, the mains remained extended. The aircraft was damaged significantly.

Even on an aircraft with a more conventional downlock system, pilots forgetting the gear pins prior to takeoff can suffer major embarrassment if the aircraft is too heavy to return for landing without spending hours burning holes in the sky to reduce weight. At the very least, pilots lose significant "pilot style points" when having to return to remove the forgotten pins.

There are many "don't forget the pins" techniques, often employed by pilots who have forgotten theirs and are determined not to repeat. My technique is about as simple as most but requires the ritualization of a few extra steps. Our aircraft came with a metal storage block used to keep the pins neatly organized that many pilots could dismiss as an odd piece of bling with a strange notch cut into it. But there is an ingenious purpose behind the notch because in some Gulfstream aircraft it is designed to fit between the cockpit's gustlock and flap handles. If installed properly, it prevents the flaps from being extended beyond the 0 deg. (UP) position with the gust lock deployed.

The gear pin holder isn't of much use, however, unless it is used ritually. If you get into the habit of ensuring the gear pin holder only has two conditions, it will prevent you from ever forgetting to remove the gear pin holders before flight. First, if the pins are removed, they must be in the pin holder and stored. Most Gulfstream crews, for example, store the pins in a compartment in the main entry door stairs. Second, if the pins are installed in the landing gear downlocks, the pin holder must be in the cockpit. You can place the pin holder on the gust lock handle, as designed, or on top of the fuel control "run" switches.

Even if you don't have such a pin holder designed for this dual purpose, you can achieve the same ends by having a gear pin bag that also has only two states. The bag is either holding the pins and stored or covering the throttles as a reminder.

Another invaluable technique for this situation is the "last chance check." The last chance is a staple of fighter aviation. The fighter taxies to the end of the runway with all its ordnance and guns "safetied." A ground weapons specialist "unsafeties" the weapons and looks the airplane over. It is the last chance to make sure everything is good to go. You can do this too. I never close the cabin door until ready to start engines. At that point, my last act before closing the door is to walk to the nose of the aircraft, kneel down so as to have a complete view underneath the airplane, and scan from wingtip to wingtip. I've never forgotten the gear pins to this point, but I have caught chocks and an open fuel door. The last chance check can make up for a multitude of sins. But like most techniques of this type, you have to use it all of the time for it to work.

Paranoid About Cabin Altitude

If you are in the business of high-altitude flight, you probably regularly practice a decompression in a simulator with the aim of descending rapidly to breathable atmosphere. In fact, your initial aircraft type certification probably requires the maneuver. I have been practicing the maneuver in all sorts of aircraft simulators and have had it happen to me in real airplanes twice. There was no mistaking the event in the airplane and the simulator training proved invaluable. But what about a pressurization scenario of a more insidious nature?

I know of at least five aircraft that have been lost with all souls on board due to a failure to pressurize or a slow loss of pressurization. The greatest loss of life was with Helios Airways Flight 522, a Boeing 737, on Aug. 14, 2005. All six crewmembers and 115 passengers were killed.

The airplane was written-up on the flight before the accident for sounds of a pressurization leak around a service door. A mechanic signed off the airplane after applying the troubleshooting procedure from memory. He set the pressurization system to its manual mode and used an external air source to ensure the cabin pressure differential could be brought to its maximum limit.

This ad hoc procedure failed on two counts. First, the fact the cabin could maintain maximum pressure with the external air source did not rule out a leak. Second, he failed to return the pressurization system switch to its automatic mode, as the troubleshooting checklist would have directed. He returned the aircraft to service with the pressurization switch set to a manual mode. The crew failed to catch the misset switch, took off and misinterpreted the cabin altitude warning horn during the climb. (The warning horn had two modes. On the ground, the warning horn meant an improper takeoff configuration. Inflight, it was used to alert the crew of a high cabin altitude.) Everyone on board eventually passed out and perished once the airplane ran out of gas and crashed.

As tragic as was that loss, a more typical example of slow-onset hypoxia occurred on April 19, 2012, involving Cessna 421C N48DL. The case is more typical because the airplane was lost at sea and we will never know what caused its failure to pressurize or its gradual loss of pressurization. The aircraft departed Slidell Airport, Louisiana (KASD) for Sarasota, Florida (KSRQ) with only the pilot on board. Everything appeared normal when he contacted ATC at FL 270. But problems became apparent 20 min. later when he started to deviate from course and altitude. When efforts to contact him failed, the North American Aerospace Defense Command launched fighters to intercept. The fighter pilots reported the Cessna twin was circling in a left-hand turn at a slow speed, the windows were frosted over, and the pilot was slumped over in his seat. The aircraft continued to circle for 3 hr. before crashing into the Gulf of Mexico.

NTSB

Cessna 421C N48DL, moments before submerging in the Gulf of Mexico.

In these and other hypoxia case studies the classic pressurization and hypoxia lessons are immediately apparent. Fuselage pressure leaks should be addressed immediately and repaired following the manufacturer's recommended maintenance procedures. Oxygen supply and delivery equipment must be thoroughly checked during each and every preflight. When troubleshooting a pressurization problem, donning oxygen quickly will not only improve your mental capabilities, it can keep you in the game if things go wrong quickly or insidiously.

But the problem with slow-onset hypoxia is that by the time you have been affected, you may not have the mental ability or physical dexterity to react properly. What about technological solutions? In many such cases, warning systems either failed or were misinterpreted. Even when working correctly, the warning sometimes comes too late. Typical cabin pressure alerts trigger at 10,000 ft. cabin altitude. But if the pressure was just below that point for an extended period, you may not have the mental alertness to react correctly. Some pilots fly with oximeters to measure blood oxygen saturation levels. These are effective but require the pilot to have the presence of mind to use them at the right time. What about checklists?

The checklist in the Cessna 421C Pilot's Operating Handbook is typical of many aircraft when it comes to pressurization systems. It instructs pilots to set the system in the climb and reset it during cruise, but not to check how well it is working otherwise. Many business jets have a "Pressurization system . . . . check" step in the climb checklist, but little is written about when to check

A Gulfstream G450 cabin altitude gauge in a climb, passing 10,000 ft. aircraft altitude.

it or, in fact, what to check. I can offer a technique to reliably prevent a pilot's failure to notice their aircraft has failed to pressurize before it's too late.

If presented with a "climb checklist" sandwiched between a "takeoff checklist" and a "cruise checklist," pilots are given wide latitude as to when the checklist steps are accomplished. Some pilots will be tempted to accomplish the climb checklist immediately, just to get it out of the way. Having spent many years on jump seats observing other crews, I think this might be the most common approach. If the pressurization system is checked at a low altitude, the cabin altitude may not have budged at all and the check becomes almost useless. Another technique is to wait until passing transition altitude, typically 18,000 ft. This lumps other checklist items together for convenience. If the cabin is struggling to keep up with the climb, waiting this long may keep the cabin pressure numbers below alert limits but not low enough to prevent mental incapacitation.

I recommend you always check your pressurization system at 10,000 ft. aircraft (not cabin) altitude. If the airplane failed to pressurize during a normal climb, you should still be mentally aware enough to react accordingly. This answers the question of when to check, but many pilots check the wrong thing and what they have checked doesn't give them the information needed to realize there is a problem.

We pilots often gravitate toward technical numbers because they reassure us that there is science behind all that we do. When checking cabin pressure, it can be comforting to report, "we have a Delta-P of 3.0." If you are passing 10,000 ft. aircraft altitude, is a differential pressure (Delta-P) of 3.0 lb. per sq. in. the right answer? It could be for your airplane, but it certainly is not for mine. But even if it is the right answer in this instance, do you intuitively understand how to deal with a Delta-P slightly higher or lower?

I recommend that you always check your cabin altitude in terms of the number of feet of altitude; announce this out loud to place this information into your subconscious so you can log away the correct range of answers. Chances are, however, that you don't know the correct answer unless you've specifically looked for it. So, let's take a quiz. Let's say you are climbing to an altitude in the middle-to-upper range of your airplane's capability. If you haven't been delayed in the climb by ATC more than a minute or two, what should your cabin altitude be when passing 10,000 ft.? For my aircraft, the answer is right around 500 ft. Does that number seem impossibly low?

My aircraft can average 3,000 fpm in a climb to 45,000 ft. and the climb rate in the first 10,000 ft. can be double or triple that. I can make it to 10,000 ft. in a minute or two. Most aircraft, mine included, will pressurize at a rate of 500 fpm. So, I should rarely see more than 1,000 ft. cabin altitude at 10,000 ft. aircraft altitude unless I've been held at a lower altitude for an extended period.

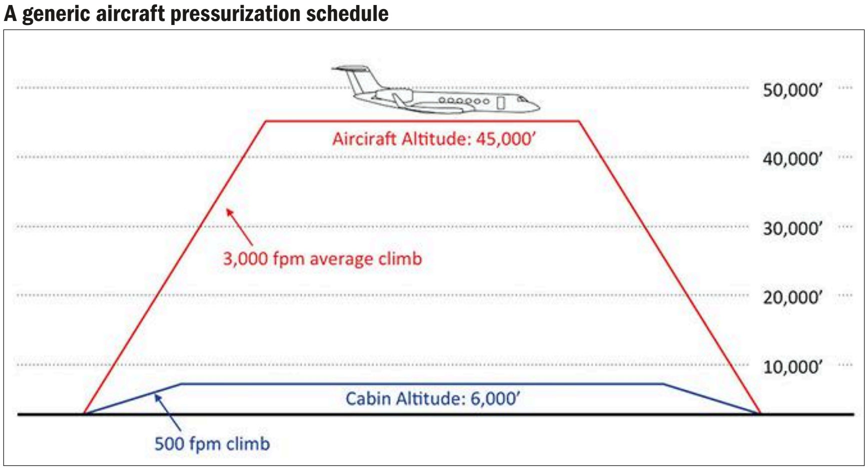
You should also check your cabin altitude once you level off at cruise. My aircraft has a maximum cabin altitude of 6,000 ft., even when cruising at 45,000 ft. Hence, I should never see more than that. If your cabin is pressurizing but a leak is causing it to slowly depressurize, the rate could be so insidious that the cabin pressurization is OK once you level off but will eventually climb above your maximum allowed altitude. By the time that happens, it may be too late for you to recognize it. In my case, if I level off and see a 7,000-ft. cabin altitude (1,000 feet below the system's warning threshold), I will know I have a problem even though the aircraft warning systems remain blissfully happy.

You should learn your aircraft's normal cabin altitude during a climb when passing 10,000 ft. aircraft altitude. You should already know your aircraft's maximum cabin altitude. If you check your cabin altitude when passing 10,000 ft. aircraft altitude and at level off, you should never be surprised by a failure to pressurize or a fuselage leak.

Paranoid About Vertical Speed or Pitch Hold Mode in a Climb

Another hazard of high-altitude flight is the need to maintain a smooth, adequate climb even as the air thins and the temperature drops, rises and drops again. Most autopilots feature a vertical mode that places a priority on keeping a

A generic aircraft pressurization schedule



target speed that should keep you comfortably above the stall angle of attack (AOA). Known as "flight level change," "speed hold" or something similar, the mode is preferred because it keeps engine thrust at the maximum permitted while varying pitch to hold that precious airspeed or Mach number. But whatever the mode is called, it is not always as smooth as we like. For that we often revert to another mode, usually called "vertical speed mode."

Vertical speed mode holds the erratic pitch changes to a minimum but requires the pilots to constantly monitor the climb rate against airspeed and thrust levels. As long as the engines are below the maximum permitted thrust level, the vertical climb rate and airspeed are maintained. But if the thrust required exceeds the thrust available, the autopilot still holds the vertical speed and the forward speed (airspeed or Mach number) suffers. This is a recipe for an aerodynamic stall.

Some airplanes may have similar issues with a "pitch hold" mode that can engage when the pilot fails to select a vertical autopilot mode or fails to realize the autopilot has done this by default. If the autopilot is doing nothing more than maintaining a certain pitch angle in a climb, the aircraft will eventually run out of airspeed as the air thins and thrust available decreases below thrust required.

You might argue that your stall warning or barrier system will keep you out of trouble. You might also argue that your instrument crosscheck will keep on top of things. In 1979, an Aeromexico crew flying a DC-10 almost lost their aircraft because they didn't understand their autopilot didn't care about airspeed when it was engaged without a vertical mode. It resorted to vertical speed mode in the climb and the aircraft stalled. The crew confused the stick shaker for an engine problem, shut down the center engine and then witnessed their airplane lose over 10,000 ft. before recovering. Incredibly, they restarted the engine and proceeded to fly across the Atlantic.

In 2013, a Cessna CJ2+ pilot almost lost his airplane because the vertical speed mode decided holding the climb rate was more important than keeping the airplane flying. The stall barrier system was defeated by a small sliver of ice in the single AOA probe. He claims his attention was diverted for only a few seconds. The aircraft stalled and the ensuing recovery included five 360-deg. rolls, enough G forces to bend the wings, and a loss of 10,000 ft. This pilot is lucky to be alive.

It is tempting to say these were pilots of inferior stock because they failed to recognize the obvious signs of a stall. But what are those obvious signs? We all know intuitively that the wings buffet and the nose drops. But is that really true? Very few of us ever get the chance to actually stall a high-performance aircraft. Our primary flight training is usually in a low-performance, single-engine prop aircraft designed to teach the wing buffet and nose drop. It is a good lesson in that it educates us that we need to break the stall AOA. But in some ways these lessons are counterproductive. Do you always get the wing buffet? Does the nose always drop?

Low-performance aircraft and some higher performance aircraft of earlier generations gave early stall warnings because their wings did not hang onto the airflow at high AOA. The flow separated early and created an aerodynamic buffeting on the wing that was often felt in the tailplane, giving the pilot tactile feedback in the pitch controls. This buffet can be completely absent in some high-performance aircraft, hence the need for stick shakers, nudgers, pushers or a combination of stall warning devices. So, you may not always get adequate warning if these systems are inoperative or you fail to interpret them correctly. But surely you would never fail to recognize the sudden nose drop!

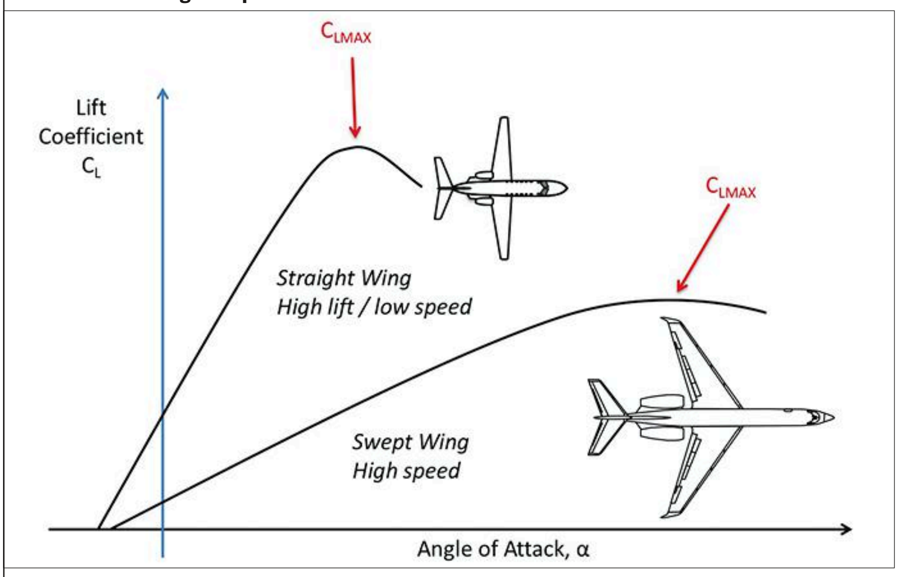
The beauty of the sudden nose drop after an aerodynamic stall is that it leads the pilot into making the correct initial response: an aggressive decrease in AOA. But basic flight training also leads us to expect this aircraft behavior for all aircraft, especially if we've never experienced a full aerodynamic stall in any other aircraft. In our minds, we've seen stalls in the simulator in our high-performance jets. But that is rarely true. Stalling a large jet can be dangerous and the regulations rarely permit it. In most cases, we are taught to recover from the initial signs of a stall. That could be naturally occurring buffet but it is more likely to be a stick shaker, pusher or nudger.

Many aircraft with straight wings and conventionally mounted tails do indeed exhibit the expected sudden nose drop. Their lift curves rise quickly, peak and drop quickly. Air separating from the wing can hit the tail, provide the pilot with tactile feedback in the controls, and then lose lift quickly. The nose drops and the pilot is given a head start on recovery. There are at least three types of aircraft that may deviate from this beneficial pattern.

Most notably, a swept-wing airplane has a lift curve that rises more gradually. After its curve peaks, it tapers off slowly while still producing lift. The supersonic T-38, for example, has razor-thin wings with a high degree of wing sweep. While its wings buffet heavily as it approaches the critical AOA, the nose never drops. The only real signs of the stall are the wing buffet and an altimeter heading down as the nose stays up.

Airplanes with T-tails may also stall without the nose drop we are expecting.

The effect of wing sweep on lift curves



As the AOA increases, the stabilizer might remain above the turbulent airflow from the wings, even at the stall AOA. If the tail hasn't yet stalled, the nose will remain up even as the airplane heads down. In the previously cited CJ2+ case study, for example, the nose remained up during the stall until the airplane snapped into the first of five complete rolls. This isn't true of all T-tail aircraft, but it is in many.

A third factor that might mitigate any nose-dropping tendency is wing design. Even airplanes with straight wings can be so well designed that their stall patterns mimic the gradual loss of lift seen in swept-wing airplanes. The lesson from all three examples is a hard one to digest. Even if your aircraft has a straight wing with a conventional tail, you cannot be sure it will stall the way you have been taught. But even if you have practiced stalls in your aircraft, you cannot be sure it will stall the same way if loaded differently or in different conditions. You need to be paranoid of an aerodynamic stall, and that means you have to be paranoid about the vertical mode of your autopilot.

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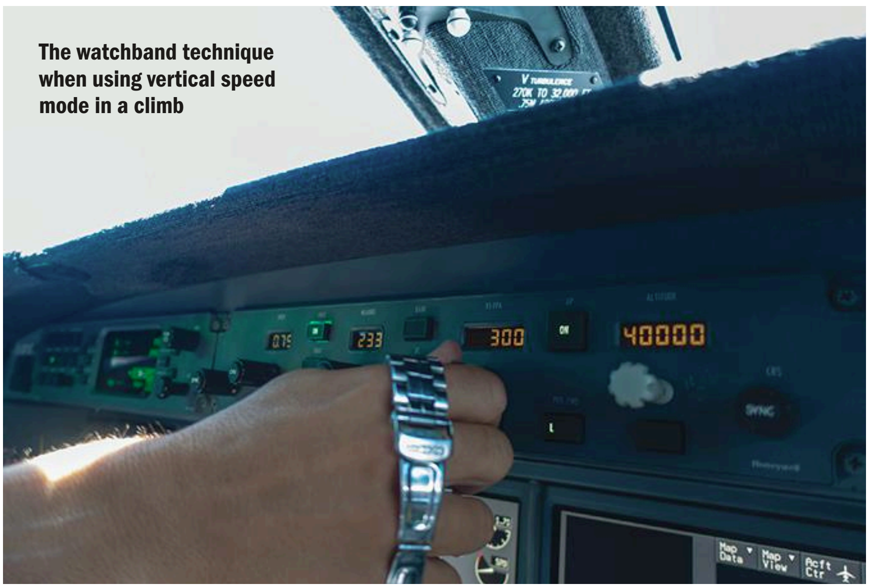

The watchband technique when using vertical speed mode in a climb

There is no getting around vertical speed mode in many high-altitude aircraft. Autopilots aren't smart enough to prioritize smooth pitch control and minimum airspeeds, so it is up to us to do that. But in a climb that can take 20 min. or more, we can forget that our vertical mode is not in a "set and forget" mode. This is much like a fuel imbalance problem, where crossflow valves are open and boost pumps are shut off. Distraction or forgetfulness can lead to disaster. I have a technique that can save you in either situation.

If I am in vertical speed mode during a climb, I take my watch off and hold it in my hand as a reminder something isn't right. I focus on the speed and if someone wants my attention, I go back to the speed hold mode. I hate having the watch in my hand; it gets in my way and after a while the metal band starts to irritate my skin. Having the watch in my hand tells me something isn't right, and I am anxious to fix what isn't right and get the watch back on my wrist where it belongs.

I use the same technique when cross-feeding fuel. Over the years, I have seen many techniques for remembering fuel crossflow procedures are in effect and I've seen most of them fail. Some pilots will place a laminated checklist between the throttle stems. Others place a fuel synoptic on a display. I used to think an egg timer was foolproof until the pilot left the cockpit during the preflight and got busy in the cabin. Just about every technique fails when the pilot gets distracted. My technique can fail too, but it is less likely to. Ever since I added this technique, I've never forgotten to return the fuel panel to normal or that my autopilot no longer has stall prevention as a top priority.

Harnessing Your Inner Paranoid Pilot

Lest you think I am only paranoid about these four things, rest assured my paranoia extends much further. You can develop a positive paranoia to prevent all sorts of problems in your specific operation.

(1) Know your airplane and procedures. The best defense against ignorance is knowledge. While you may not agree that many of the problems you are paranoid about reflect ignorance, if there is a solution to be had, then you are at least ignorant of that solution.

(2) Do not accept the "We've always done it this way" defense. The way we've always done it could very well be the best way to do things in a previous time, previous airplane or previous environment. Things change. But it could also be that some flawed condition we had to accept in the past is no longer unsolvable.

(3) Research solutions. Sometimes a problem seems to be built into the situation; no solution is possible because the problem is unsolvable. Or, as is often the case, an early solution is offered and we pat ourselves on the back and say we've done all we can.

(4) Consider when a "one-time event" is actually a systemic problem. So, how do you know you have a problem that needs solving as opposed to an event that will only happen on the rarest of occasions. That is, of course, a judgment call. But the answer might just require a simple question: "Could this happen again?"

(5) Devise Error Traps. If you find yourself with a problem that could happen again, it is time to come up with a solution. Consider asking fellow aviators flying the same equipment or opening it up to the community as a whole. Someone may have already solved your problem. Or you can adapt someone else's solution to fit your problem. But it might be up to you to invent the solution yourself.

We often think of people afflicted with paranoia as psychological basket cases, too afraid to leave the house for fear of what might happen to them should they be caught unaware without their tinfoil hats. But our kind of paranoia can be a life saver if properly deployed and acted upon.

Taking the time for a "last chance" external inspection can seem a nuisance the 100th time it fails to reveal anything forgotten. But the 101st time awaits you. Becoming a paranoid aviator complicates normal everyday life. But these added complications avoid those other complications you would rather be without. BCA