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

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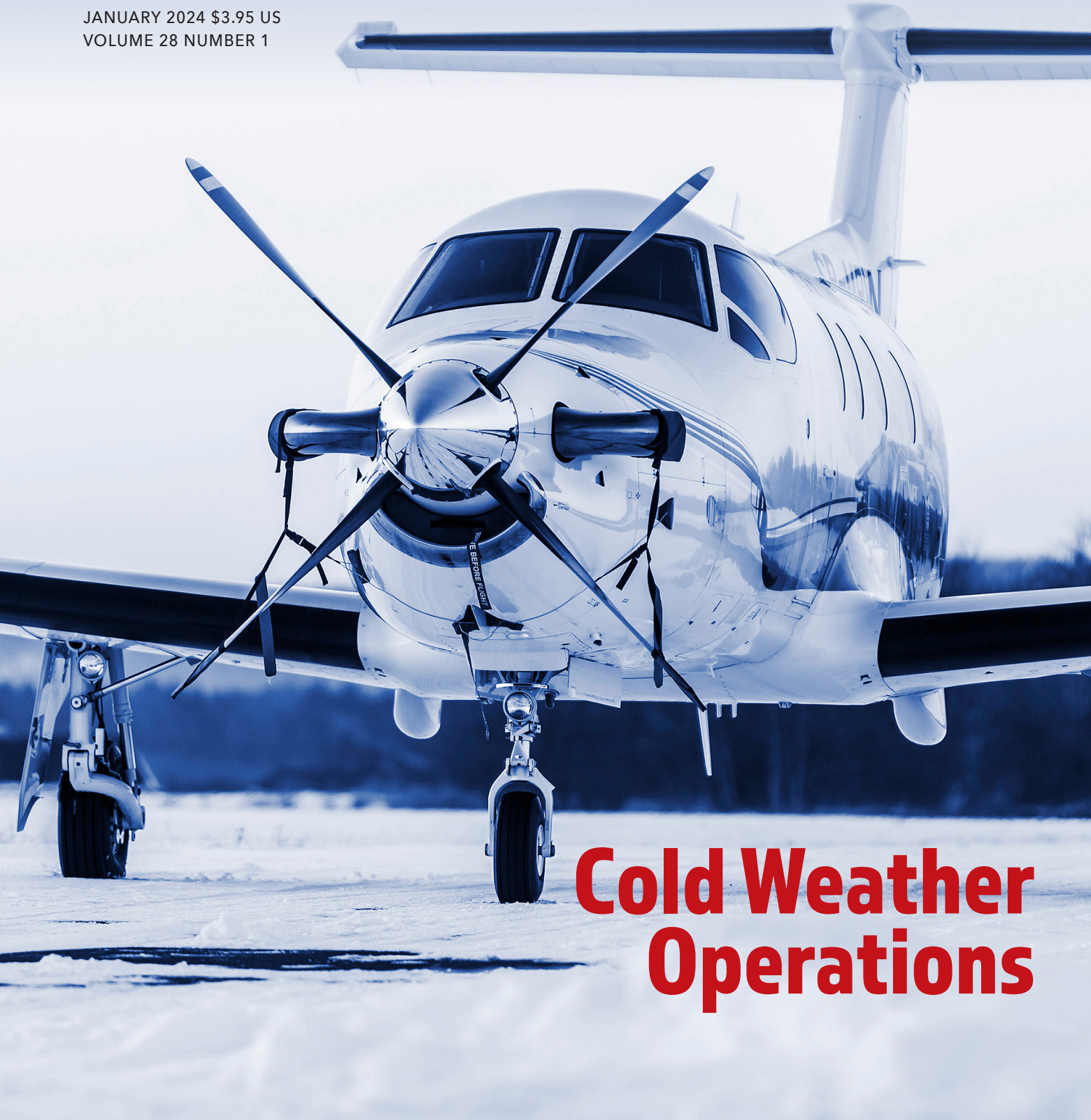

Cold Weather Operations

TWIN & TURBINE

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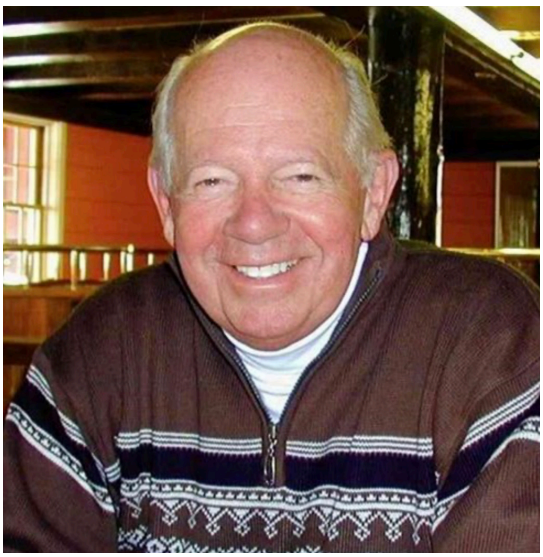
by **Lance Phillips**

Looking Back and Planning Ahead

The writers and staff at Twin & Turbine wish all of our readers and advertisers a happy new year and a prosperous 2024. As we resolve to be better and continuously improve, whether in regard to aviation or otherwise, there is a great opportunity to evaluate what went right, and maybe not so right, in the previous year. With that in mind, I would like to start 2024 with some ways in which we can improve, learn, and remember some of those who came before us, breaking new ground in aviation and paving the way for the flying environment we experience today.



David Hinson left us with an amazing aviation legacy.

I always enjoy the time available during the holidays for considering the past year and planning ahead without the myriad distractions occurring during regular months. Once, when working with a European company, I got a lot of laughs when explaining to my colleagues that I was going to take an afternoon off so that I could get some work done. To me, it made sense: turn everything off so that I could focus. To them, work was work, and off-time was off-time. I began an appreciation for that European mindset; it's a healthier one, probably, but we Yanks do things a little differently. Either way, the time to collect and not be distracted is invaluable.

January is dead winter for lots of our readers in the North. For me in Texas, though, it's just starting to get a little chilly, and it's time to start thinking about things like ice and general cold-weather operations. T &T writer Pete Ruskay, an international aviation professional, gives us the low-down on safety during these frosty months.

Being a safer pilot is always in style. The Citation Jet Pilots Association (CJP) is the perfect organization to give us the latest and greatest techniques and best practices for your operations, whether you run a flight department or a single-pilot personal aircraft. Tigre Pickett details Safe to Land and Flight Data Monitoring programs promoted by CJP, benefitting all of us.

Through the Editor's Pics column, I get to show unique aircraft through the lenses of unique cameras. This month doesn't disappoint – I will take you to the Frontiers of Flight Museum with my medium format Pentax 67.

December 2023 saw the passing of an aviation great, David Hinson. In honor of Mr. Hinson, we review a past article about Flightcraft of Portland, Oregon. Hinson owned Flightcraft for a time before he went on to run an airline and later the Federal Aviation Administration. One of my other duties besides Twin & Turbine is managing the Pinnacle Air Network, of which Flightcraft is one of the founding member companies.

We are so lucky to have such a robust and experienced group of writers at Twin & Turbine. Thomas Turner, through his Mastery of Flight series, shows how to build complexity into our autopilot routine in order to thoroughly understand the processes and techniques to keep the blue side up.

Finally, David Miller quotes his readers' reactions to his months-long quest of selling his aircraft and then contemplating his next carpet ride.

Thank you for continuing to support Twin & Turbine magazine and our goal of providing operators of these remarkable aircraft with entertaining and valuable information. Have a wonderful new year.

lance@twinandturbine.com

IT'S THAT TIME OF YEAR (AGAIN)

by **Pete Ruskay**

Although it seems like summer was just here, Christmas has come and gone, and the snow is falling here in the Northwest. With the thick of winter quickly approaching, we should focus on cold weather operations with the goal of awareness and flying as safely as possible.

The manufacturer of the business jet that I operate releases a Cold Weather Operations Guide each autumn. The OEM feels that although professional pilots operate these capable jets, the risks involved with cold weather and icing operations are so significant that they must reinforce proper cold weather procedures every year. I don't have a photographic memory, so this valuable refresher gives me the confidence I need when heading off to work. In that spirit, let's review cold weather operations, the hazards involved and the tradecraft used when flying in less-than-ideal conditions.

Let's start with some icing basics. High-performance business jets perform optimally with smooth, uninterrupted airflow over their wings, tail and control surfaces. Introduce some disturbance to the airflow, and that optimization quickly erodes. Studies have shown that icing only as thick and rough as sandpaper can reduce lift by up to 30% and increase drag even more - as much as 100%. That eye-watering fact should make any aviator understand that icing is serious business, regardless of the aircraft flown.

As with most risk management, the best way to minimize negative consequences is to identify and mitigate the most significant dangers. This risk mitigation is essential for cold weather operations. In a perfect world, we would operate in calm, clear conditions and preferably to a destination near fine sand, warm water and delicious foods grilled on a stick. The reality is that we must attend meetings, visit loved ones or deliver goods to places that don't fit my description of a perfect world – and we will be flying into icing conditions. Heck, your perfect world may be fine powdered snow while gliding down the ski slopes. Anyone operating in an icing environment must do their homework and master many things, including recognizing the conditions conducive to icing, deicing/anti-icing systems of their aircraft and the procedures each manufacturer recommends.

Detailed knowledge of meteorology beyond the basics is essential. A thorough understanding of frontal characteristics, temperature inversions, types of icing, and accumulation rates is critical – not optional. Knowing what goes into Icing Forecasts, AIRMETS, SIGMETS, field condition and braking action reports will give a disciplined pilot the information needed to make safe operational decisions.

FAA Advisory Circular 91-74B, titled Pilot Guide: Flight In Icing Conditions, is an invaluable resource that concisely (in 63 pages no less) covers everything any pilot should consider before attempting to operate in cold weather conditions. If one adopts a practice of periodic review, AC 91-74B is a valuable document to put on the list.

One of this AC's many topics is explaining certification requirements and how they have changed over time. Before 1973, Part 23 aircraft were certified for light icing and flight into moderate icing for a limited time only. Those pre-'73 ice protection systems can only be considered a means of escaping an icing condition. It's vital for anyone flying one of these aircraft to understand and respect this limitation. There are too many cases of overconfident pilots flying into icing conditions with the false impression that their aircraft could handle these conditions, often to their peril.

As time passed, certification included testing for flight into known icing (FIKI). Just because your aircraft may be certified FIKI, this is no magic bullet that allows you to disregard proper planning and decision-making.

Unless pilots exercise sound airmanship, they and their FIKI aircraft can become an accident statistic, too.

Enough of the doom and gloom – now is our opportunity to discuss best practices and tradecraft to avoid being the accident statistic. Weather is the hardest to predict and the most variable factor in every flight. Make every effort to obtain the most current PIREPS, AIRMETS, SIGMETS and freezing level forecasts before each flight into conditions that can produce icing. Remember that a lack of PIREPs does not mean there aren't hazardous conditions present. Sometimes, pilots fail to give icing reports or simply no one flying along your flight route.

If your preflight weather planning points toward possible icing, your aircraft preflight will become even more critical. Aircraft equipped with leading-edge boots require a thorough inspection of all areas of the boots to find tears or cracks that could inhibit proper inflation when needed. The same holds for propeller heating elements. Ground testing of pitot heat, windshield heat or hot plate operation can prevent an accident before the aircraft leaves the ramp.

Should your departure airport be contaminated with snow, slush, or ice, care must be taken during taxiing to minimize splashing contaminants into

wheel wells, flaps, and control surfaces where it can freeze. If flaps are used for takeoff, delaying flap deployment until taking the runway will eliminate frozen contaminants obstructing retraction mechanisms. After takeoff, delaying gear and flap retraction and allowing contaminants to blow away is a useful best practice.

Once airborne, listen up on frequency to hear what controllers and other pilots are saying about the conditions. Base and top reports are the best way to understand the weather in your sector and, along with your OAT gauge, will indicate when icing could occur. Take the initiative to ask ATC; if no reports are available, be responsible and give them accurate reports of what you are experiencing. The next pilot through that airspace will surely appreciate it. You should activate propeller heat, windshield heat, hot plates, etc., before entering any potential icing environment and always by the POH or AFM.

Icing will adhere to small protuberances before larger ones, so pay close visual attention to those areas of your airframe. The windshield wipers would be my first indication of icing in the Navajos, Cheyennes and King Airs I once flew. A high-intensity flashlight will help you see these unlit areas in darkness and is a great backup in case wing inspection lights fail.

A pilot exercising sound risk management will give himself three outs when icing conditions occur – vertically, either up or down, and if that fails, the ability to reverse course out of the icing event. In general, icing layers are relatively thin - only a few thousand feet thick and in most cases, climbing through or descending to a lower altitude will do the trick.

Beware if trying to climb through an icing layer, though. As ice accumulates on any airframe, the significant increase in drag can deteriorate the aircraft's ability to climb. Depending on the accumulation intensity, expect higher than normal climb power settings. Aircraft sometimes run out of climb performance and, in some cases, the ability to maintain level flight. In this situation, if there isn't enough terrain clearance to descend, the only out is to reverse course and exit the icing area from where you first encountered it. Do so calmly and carefully as the lift further deteriorates in turns, raising stall speed. When descending through icing layers, try to do so expeditiously and at as high an airspeed as practical, as ice accumulates less as airspeed increases.

Once entering the terminal area, the combination of being close to the ground while flying at slower airspeeds increases the risk in icing conditions, making it the most dangerous phase of flight. If you expect icing, activate all heated surfaces before beginning an approach, especially before entering this high-workload environment. If leading-edge boots have been activated, another cycle on and off is a good habit to adopt. Should you be required to enter a holding pattern in potential icing conditions, do so at a higher airspeed and refrain from extending flaps until they are required for landing.

During the approach and landing phase, tailplane icing becomes a significant factor to consider and manage safely. Tailplanes will collect ice earlier than wings because of their thinner profile. Compounding that problem is that most tailplanes are not visible to the pilot, so precautions must be taken. On most aircraft, tailplane ice accumulation can cause a nose-down moment as the center of lift

(CL) moves aft of the center of gravity (CG). If using your autopilot, be aware that the trim may be trying to counter this moment and be prepared for a possible pitch down when you disconnect. The key is not to get startled when the workload is already high.

AC 91-74B also advises that if tailplane ice is suspected, approach speed should be increased 25% above non-icing speed, and with this airspeed additive, expect your landing distance to increase 20% for each 10% airspeed increase. If possible, a partial flap landing is preferable. Generally, flap settings up to half give the best lift performance, while the last half creates the most drag and can aggravate a pitch-down event. Of course, these are ballpark numbers, and POH, AFM, and runway requirements must always take precedence. Have a suitable alternate with a longer runway in your back pocket should your landing performance become critical.

I'll end with a war story to reinforce my cold weather perspective. While flying an Aerostar during my check-hauling days, I flew the NDB approach into Hartford, CT (KHFD) to minimums one evening. It was particularly challenging with a rain-to-snow mix, and I was already busy trying to time my approach and drag the NDB tail to stay on the approach course. Undoubtedly, I had picked up ice on the arrival, as scary 4-inch-long icicles had formed on the propeller spinners. I delayed flap retraction and selected half flaps while adding about 20 knots to my approach speed. Although I was exercising all the tradecraft in my bag of tricks, when I went into the landing flare, about two feet over the runway, the aircraft stopped flying, and I landed hard.

My knees nearly buckled when I got to the ramp and post-flighted the tail. It looked like a scene from Shackleton's expedition, with maybe an inch of ice covering the entire surface. I can only imagine how full my hands would have been if I hadn't planned ahead and taken flap and speed precautions. These are the types of events that burn into your brain. This event alone is why I prefer destinations with sand, warm water and food on a stick!

When faced with cold weather operations, knowledge and planning will help mitigate some of the inherent risks, while sound judgment and understanding of both your aircraft and personal limitations will stack the deck in your favor. We should all strive to describe each of our flights as uneventful!

Y'all be careful out there. T&T

Peter Ruskay, CAM, *is a second-generation corporate pilot who holds ATP and FE certificates with five jet type-ratings. He has over 11,000 hours of flight experience and has spent the past 25 years flying long-range, large-cabin business jets in extensive international operations. Pete holds NBAA Certified Aviation Manager and NBAA Certified Safety Manager qualifications. He can be reached at* **airpedro@aol.com.**

Navigating the Skies with Confidence:
CJP's Commitment to Safety

by **Tigre Pickett**

As pilots, we navigate a world of inherent risks, constantly seeking ways to minimize them and ensure the safe return of our precious cargo: our passengers and ourselves. During my first Citation Jet Pilots Association (CJP) annual meeting in Nashville, Tennessee, I witnessed firsthand the organization's unwavering commitment to safety through its engaging safety stand-downs and presentations.

I was familiar with CJP's Safe To Land (STL) efforts. Still, I had a lot to learn about the history of the program and the efforts to use data collected from Flight Data Monitoring (FDM) to reduce approach and landing accidents (ALAs) in their membership and for Citation pilots at large.

As a newer professional pilot and student CFI, I wanted to learn more about CJP's safety efforts. So, I spoke with Charlie Precourt, a former U.S. Air Force pilot and NASA astronaut. Charlie also chairs the CJP Safety Committee and co-founded Safe To Land. He described their data-driven approaches to reduce flight risk during aircraft approaches and landings.

CJP's Safe To Land and data monitoring initiatives were inspired by Flight Safety Foundation's (FSF) 2017 safety report, which explored psychological factors impacting pilots' "intentional noncompliance with critical safety policy" and reticence to go around during unstable approaches or landings.

The FSF study shows that approach and landing account for roughly 65% of all accidents, and over a 16-year period, 83% of runway excursions could've been avoided by choosing to go around. Moreover, go-arounds were executed only 3% of the time for unstable approaches.

Even data from the National Transportation Safety Board (NTSB) underscores that 43% of all General Aviation (GA) mishaps from 2012 to 2021 were associated with the approach and landing phases of flight.

So, given all the hours of training and check rides that high-performance and professional-level pilots go through, why are pilots still having mostly preventable accidents on

approach and landing? According to the FSF study, training, experience, and culture regarding the go-around are major contributing factors.

The go-around, an essential and standard maneuver when an approach or landing is unsafe, is often forgotten after the check ride. Speaking from my own experience, I busted my first type rating after a bungled VOR approach. I bugged an incorrect localizer frequency and struggled to troubleshoot the issue. At the same time, in the simulated soup and at MDA — instead of recognizing the go-around as my get-out-of-jail-card option — it took my DPE to remind me, "Perhaps you want to go around?"

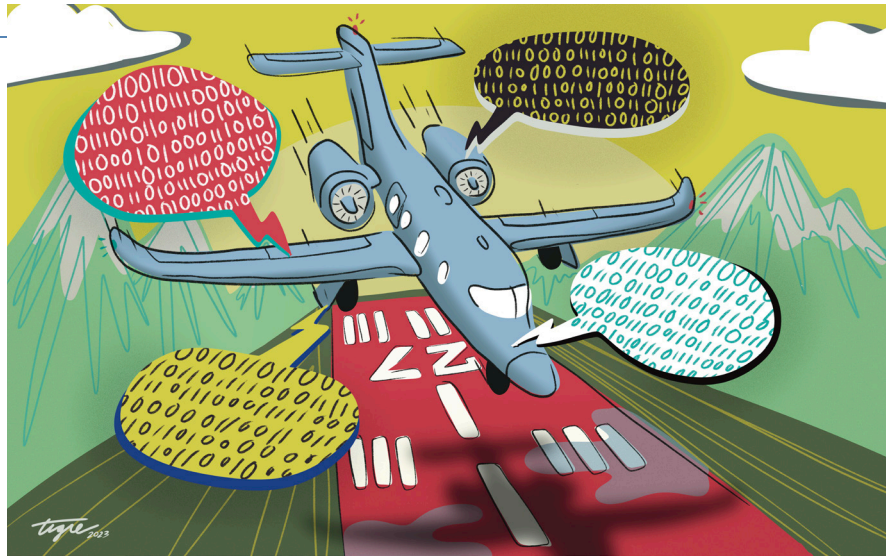
The FSF's findings echoed my mentality – stable or unstable, pilots and crews wanted to land the plane. Crew's noncompliance with go-around procedures, get-there-itis, and industry culture accepting or tolerating noncompliance reinforced those habits and patterns. Sprinkle in minimal real-world go-around experience, fear of go-around risks, and challenging ATC instructions in a high workload environment, and all of this adds up to pilots making ALAs instead of go-arounds.

Charlie and the CJP Safety Committee were concerned about the high rate of runway excursions — 50% of all accidents — among all Citation aircraft operators, including CJP members. They began to wonder what habits Citation pilots had developed that contributed to these runway excursions and how they could help pilots be better.

Recognizing that approaches and landings were the predominant causes of accidents or incidents, the CJP Safety and Education Foundation hired the Presage Group in 2021 to survey CJP members and explore what may be contributing to this alarming statistic.

Following the survey, two parallel initiatives were born: Safe To Land (STL) and Flight Data Monitoring (FDM).

STL's primary goal is not to dictate how pilots should operate their aircraft but to provide them with insights that encourage thoughtful and safe flying.



Recognizing the psychological hurdles for pilots, STL added a new "yellow zone" to the traditional approach standards of stable (green) and go-around (red). Pilots can acknowledge the unstable approach issue, attempt to fix it, and then have a commitment point to execute a go-around.

Recognizing that some approaches go unstable below the 200-foot gate and even as late as in the touchdown zone, the STL procedures add to the traditional Stable Approach criteria by including Touchdown Zone Gates for landing factors like floating or drifting and go-around decision points where continuing to attempt to touchdown could result in an overrun. These points are called touchdown point limits, and reference markers on the runway used as visual cues (intersecting taxiways, runway remaining markers, etc.).

In a testament to CJP's members and STL efforts, while Citation pilots still have ALAs and excursions, CJP members have had zero incidents or accidents since STL's inception.

STL's sister initiative, FDM, was created to apply Flight Operations Quality Assurance (FOQA) practices that charter operations and airlines were using and bring them to the GA level. By collecting voluntary flight data and aggregating it with data from similar airframes and operating conditions, CJP hoped to identify trends and provide educational insights to its members.

Excitement and early adoption of the FDM program were sluggish compared to STL. Many pilots were apprehensive about the notion of 'Big Brother' having access to their flight data, fearing potential repercussions.

Recognizing the valid concerns surrounding data privacy, Precourt reassured, "We've taken the precaution of anonymizing data from the very inception of this initiative and have implemented stringent mechanisms to safeguard the anonymity of all contributors."

"Neither I nor any other CJP personnel can access your individual flight data. We've entrusted this responsibility to a designated entity that meticulously upholds the privacy of our system."

This data's entrusted guardian is CloudAhoy (now operating as ForeFlight Flight Data Analysis). Their selection was predicated on their data-centric approach to flight analysis and debriefing tools, ensuring that all shared data remains encrypted and securely relayed for comprehensive aggregation and trend analysis.

Another challenge for CJP's FDM was gathering data across a fleet spanning decades and numerous software and technology iterations. Conventional airlines spend significant sums, well into six figures per aircraft, on capturing and analyzing flight data. Thankfully, one of CJP's sponsors, AirSync, was able to save significant sums by providing hardware for automatically capturing and securely transmitting flight data through AirSync Web Services to the user's account and the various third-party analysis

services the user has selected, such as Cloud Ahoy.

Previously, CJP tapped Garmin's MFD data card and newer Citation's maintenance logging Aircraft Recording System (AReS) recorders to help document how its pilots were flying. Newer AReS II recorders even allowed CJP's FDM to capture and analyze an extensive array of parameters and data, including speed, computer errors, weight on wheels, flaps, gear position, and throttle position.

A primary objective for CJP's Safety Committee was to ensure that both programs assist its pilot members in better anticipating flight risks and dealing with them safely. STL is geared towards reducing approach and landing accidents. At the same time, their FDM initiative hopes to inform pilots of areas where they could be bumping up against limits set by their Airplane Flight Manual (AFM), the Federal Aviation Regulations (FARs), and CJP's Standard Operating Procedures (SOPs).

Exceeding limits such as VMO/MMO during descent, receiving warnings of flap or gear overspeed, G-limit transgressions, and autopilot activations beyond prescribed limits are all data points that FDM captures. This data is then sent near-instantaneously to anonymized databases for review and compared directly to similar airframes and even to FARs to see improvement and risk reduction areas.

"What we've learned, both as pilots and through our work with the CJP Safety Committee, is that accidents or incidents typically result from a confluence of factors," Precourt emphasized. "By scrutinizing our flight performance and exploring this data across various metrics, we are embracing a trend already prevalent among the newest generation of student pilots. They can compare their flight performance to their peers, receive constructive debriefs, and evolve into safer, more skilled aviators."

FlightSafety has collaborated with CJP to introduce a Safe To Land Course, and Gulfstream is now working with FlightSafety to set up its version of Safe to Land. Additionally, Honda has launched a version of Safe To Land.

The FlightSafety course comprises a one-day simulation training program, encompassing two hours of classroom instruction and two hours in the simulator. It includes 11 scenarios designed to simulate "insidious instabilities" and real-life borderline cases where the choice between "Continue" and "Go Around" is critical.

"The FlightSafety course underscores the imperative of monitoring the gates," Precourt emphasized. "Many of these scenarios are geared towards ensuring that the pilot is cognizant of the gate limits and respects them."

"While not every scenario yields a straightforward 'black or white' answer, there will be cases where either a 'Go Around' or a landing would have been acceptable. However, our aim is to inculcate the awareness that both options exist and the potential

need for a 'Go Around.' Rather than persisting blindly and realizing later that 'I barely managed to stop this thing!'", Precourt added.

Precourt anticipates the rich insights and possible insurance savings the accumulated data will unveil in the years ahead. CJP is already identifying areas where awareness and training can be further enhanced for Citation pilots.

With comprehensive and statistically robust data, the team has discerned a trend. While straight-in approaches for CJP pilots have improved due to three years of Safe To Land training, VFR traffic patterns are often executed too tightly and without stabilization, contravening the SOPs.

Data analysis and mapping show that pilots can achieve stabilization above the 500-foot decision gate if they adopt a less constricted base turn. At the annual convention, Precourt was educating pilots to ensure a minimum 2.5-mile radius for the base turn, which positions them to roll out at 600' AGL and allows them to fly stabilized for two gates for the final approach.

With Citation Jet Pilots embracing more disciplined approaches to safer flying, they are paving the way for other owner-pilot associations to utilize flight performance data to protect lives and aircraft and maybe — just maybe — lower insurance premiums for being safe to land. T&T

Tigre Pickett *is a commercial single- and multi-engine pilot type rated in the Citation 525-series jets. With his father and Co-Captain, Rich Pickett, Tigre manages multiple CitationJets in southern California. Tigre has a passion for aviation and loves to fly various aircraft, exploring new destinations with his family in their Cessna Turbo 206. You can follow his exciting journey as a professional pilot alongside Captain Pickett on their YouTube channel and find more aviation content on* **PersonalWings.com.**

Editor's Pics

Photos & Story
by Lance Phillips

This month, we will review a few photos from completely different spectrums (and eras) of the photographic world. To begin, I'll take you to the Frontiers of Flight Museum in Dallas, Texas within and around which I captured the sights with my old Pentax 67 medium format camera.

I have presented a few photos taken with the Pentax 67 in these pages before; Oshkosh last year comes to mind immediately. If you can imagine a normal 70s-80s era SLR, like a Nikon F3 or Canon AE-1 and double what your mind's eye sees, that's basically what a Pentax 67 looks and feels like–a giant SLR.

A 35 mm camera (like the aforementioned Nikon and Canon) uses a 24 mm by 36 mm negative to achieve a 2:3 image ratio. The 35 mm camera was first envisioned by Oskar Barnack in 1903 and then produced by Leica (Leitz Camera in Wetzlar, Germany) in 1913. Leica still makes and sells the world's best 35 mm film cameras and lenses in 2024. It also manufactures and sells amazing digital cameras. The readers of Twin & Turbine will see some of my Leica film images in later issues this year.

Early large format cameras, introduced in the mid-1800s, used huge 4-inch by 5-inch or 8-inch by 10-inch sheet-film negatives. The first production model called the Reisekamera, ironically translated as a travel camera, was a big, cumbersome box with bellows and lens apparatus. But it took incredible photos. Large-format cameras are still used and in production today.

The first medium format camera, the Brownie, was designed and produced by Kodak in 1901. Kodak, the Brownie, and medium format film (designated 120 film) brought photography to the masses because of its portability compared to large format cameras. 120 film rolls can produce various size negatives, the most popular being 6 cm x 6 cm and 6 cm x 7 cm (used by my Pentax), along with others like 6 cm x 9 cm. Different camera designs can stretch one side of the negative, but the width is always 6 cm.

That's all the nerdy camera stuff you get for now. Let's see some unique airplanes.


N281FP


U.S. AIR FORCE

As one walks around the outside of the Frontiers of Flight Museum in Dallas, they'll first come across an example of Learjet's 24D model from 1973. Serial number 281 logged a total of 7,330 airframe hours and 8,707 landings before coming to FoFM.

There are lots of airplanes inside the museum, but of course, I am drawn to the weird ones first. According to the museum's website:

The Chance Vought V-173 "Flying Pancake" is a one-of-a-kind aircraft that dates back to WWII. Designer Charles H. Zimmerman theorized that aircraft could fly at very slow speeds with an extremely low-aspect-ratio wing design. Zimmerman minimized drag by placing large-diameter propellers at the end of the circular airfoil wingtips, maintaining a uniform flow of air over the flat pancake's single wing.

Even though the proof-of-concept Chance Vought V-173 "Flying Pancake" exhibited unusual flight characteristics, the V-173 could almost hover, survived forced landings including a nose-over, and could be piloted effectively. Charles Lindbergh, the first man to fly solo across the Atlantic Ocean, piloted the V-173 "Flying Pancake" on several occasions and found it very responsive. The V-173 "Flying Pancake" is believed to be responsible for several UFO sightings by the general public in the early 1940s.

Hanging appropriately from the center ceiling is a full-scale replica of the Wright brothers' Wright Flyer (at left). I don't want to spoil anyone's visit to Dallas to see the rest of the museum first-hand, so I'll stop there. But before we depart the pattern, I'd like to bring you a photo from reader, Steven Busch (opposite page). He caught a beautiful Midwest sunset on his iPhone and sent it in. If you have a great photo that you think others will enjoy, send it my way. T&T

"To me, photography is an art of observation. It's about finding something interesting in an ordinary place…"

— Elliott Erwitt

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317	CHALLENGER 350
29	CHALLENGER 3500
29	CHALLENGER 600
25	CHALLENGER 601-1A
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52	CHALLENGER 601-3R
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107	CITATION CJ1+
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50	CITATION II/SP
164	CITATION III
173	CITATION LATITUDE
58	CITATION LONGITUDE
376	CITATION M2
510	CITATION MUSTANG
142	CITATION S/II
366	CITATION SOVEREIGN
118	CITATION SOVEREIGN+
315	CITATION ULTRA
289	CITATION V
27	CITATION VI
135	CITATION VII
324	CITATION X
39	CITATION X+
314	CITATION XLS
358	CITATION XLS+
17	DORNIER ENVOY 3
33	ECLIPSE 550
317	ECLIPSE EA500
20	EMBRAER LEGACY 450
83	EMBRAER LEGACY 500
113	EMBRAER LEGACY 600
72	EMBRAER LEGACY 650
16	EMBRAER LINEAGE
379	EMBRAER PHENOM 100
580	EMBRAER PHENOM 300
113	EMBRAER PRAETOR
57	FALCON 10
21	FALCON 100
15	FALCON 200
272	FALCON 2000
5	FALCON 2000DX
23	FALCON 2000EX
162	FALCON 2000LX
148	FALCON 2000LXS
25	FALCON 20C
15	FALCON 20C-5
17	FALCON 20D
1	FALCON 20D-5
11	FALCON 20E
48	FALCON 20F
75	FALCON 20F-5
182	FALCON 50
5	FALCON 50-4
8	FALCON 50-40
115	FALCON 50EX
282	FALCON 7X
70	FALCON 8X
173	FALCON 900
28	FALCON 900C
21	FALCON 900DX
351	FALCON 900EX
99	FALCON 900LX
22	GULFSTREAM G100
130	GULFSTREAM G150
238	GULFSTREAM G200
305	GULFSTREAM G280
13	GULFSTREAM G300
11	GULFSTREAM G350
324	GULFSTREAM G450
131	GULFSTREAM G500
641	GULFSTREAM G550
465	GULFSTREAM G650
16	GULFSTREAM G-I
15	GULFSTREAM G-II
12	GULFSTREAM G-IIB
87	GULFSTREAM G-III
175	GULFSTREAM G-IV
319	GULFSTREAM G-IVSP
202	GULFSTREAM G-V
113	GULFSTREAMG 600
32	HAWKER 1000A
5	HAWKER 1000B
7	HAWKER 125-1A
2	HAWKER 125-1AS
1	HAWKER 125-600A
55	HAWKER 125-700B
66	HAWKER 4000
216	HAWKER 400XP
53	HAWKER 750
142	HAWKER 800A
16	HAWKER 800B
408	HAWKER 800XP
44	HAWKER 800XPI
100	HAWKER 850XP
176	HAWKER 900XP
213	HONDA JET
4	LEARJET 23
44	LEARJET 24
64	LEARJET 25
3	LEARJET 28
614	LEARJET 31
22	LEARJET 35
56	LEARJET 36
140	LEARJET 40
470	LEARJET 45
102	LEARJET 55
418	LEARJET 60
17	LEARJET 70
158	LEARJET 75
294	PREMIER I
6	SABRELINER 40A
2	SABRELINER 40EL
2	SABRELINER 40R
5	SABRELINER 60
9	SABRELINER 60ELXM
48	SABRELINER 65
11	SABRELINER 80
1	SABRELINER 80SC
1	SUKHOI SBJ
3	SYBER JET SJ30
52	WESTWIND 1
14	WESTWIND 1124
47	WESTWIND 2

TURBOPROPS - 16,319

CHIEF PILOTS & OWNERS

COUNT	AIRCRAFT
210	AVANTI
1	AVRO RJ70
483	CARAVAN 208
2275	CARAVAN 208B
37	CHEYENNE 400
140	CHEYENNE I
21	CHEYENNE IA
218	CHEYENNE II
49	CHEYENNE III
39	CHEYENNE IIIA
58	CHEYENNE IIXL
238	CONQUEST I
292	CONQUEST II
77	DAHER TBM-700A
96	DAHER TBM-700B
113	DAHER TBM-700C
383	DAHER TBM-850
134	DAHER TBM-900
70	DAHER TBM-910
102	DAHER TBM-930
138	DAHER TBM-940
66	DAHER TBM-960
165	DE HAVILLAND DHC
49	EPIC E1000
1	FOKKER 70
37	JETSTREAM 31
70	JETSTREAM 32
64	JETSTREAM 41
32	KING AIR 100
474	KING AIR 200
21	KING AIR 200C
8	KING AIR 200T
261	KING AIR 250
46	KING AIR 260
190	KING AIR 300
10	KING AIR 300LW
695	KING AIR 350
91	KING AIR 350C
35	KING AIR 350ER
397	KING AIR 350I
6	KING AIR 350IER
73	KING AIR 360
7	KING AIR 90
7	KING AIR A/B90
65	KING AIR A100
155	KING AIR A200
32	KING AIR A90
89	KING AIR A90-1
93	KING AIR B100
1154	KING AIR B200
118	KING AIR B200C
121	KING AIR B200GT
6	KING AIR B200SE
8	KING AIR B200T
46	KING AIR B90
306	KING AIR C90
40	KING AIR C90-1
193	KING AIR C90A
402	KING AIR C90B
78	KING AIR C90GT
112	KING AIR C90GTI
165	KING AIR C90GTX
18	KING AIR C90SE
257	KING AIR E90
172	KING AIR F90
29	KING AIR F90-1
5	MERLIN 300
14	MERLIN IIB
5	MERLIN III
27	MERLIN IIIA
45	MERLIN IIIB
14	MERLIN IIIC
4	MERLIN IV
11	MERLIN IV-A
34	MERLIN IV-C
91	MITSUBISHI MARQUISE
16	MITSUBISHI MU-2F
1	MITSUBISHI MU-2G
11	MITSUBISHI MU-2J
28	MITSUBISHI MU-2K
10	MITSUBISHI MU-2L
18	MITSUBISHI MU-2M
23	MITSUBISHI MU-2N
25	MITSUBISHI MU-2P
46	MITSUBISHI SOLITAIRE
70	NEXTANT 400XT
1	NEXTANT G90XT
1081	PILATUS PC-12 NG
836	PILATUS PC-12/45
216	PILATUS PC-12/47
300	PIPER JETPROP
91	PIPER M500
263	PIPER M600
601	PIPER MERIDIAN
292	QUEST KODIAK 100
3	QUEST KODIAK 900
15	ROCKWELL COMMANDER
6	STARSHIP 2000A
54	TURBO COMMANDER 1000
21	TURBO COMMANDER 690
134	TURBO COMMANDER 690A
136	TURBO COMMANDER 690B
80	TURBO COMMANDER 840
27	TURBO COMMANDER 900
26	TURBO COMMANDER 980

TWIN PISTON - 7,649

OWNERS

COUNT	AIRCRAFT
37	BARON 56TC
1677	BARON 58
428	BARON 58P
119	BARON 58TC
3	BARON A56TC
186	BARON B60
355	BARON G58
108	CESSNA 310
167	CESSNA 340
552	CESSNA 340A
50	CESSNA 402B
124	CESSNA 402C
27	CESSNA 404
317	CESSNA 414
452	CESSNA 414A
42	CESSNA 421
28	CESSNA 421A
309	CESSNA 421B
707	CESSNA 421C
59	CESSNA T303
112	DIAMOND D42
20	DIAMOND IA
80	PIPER 600 AEROSTAR
3	PIPER 600A AEROSTAR
45	PIPER 601 AEROSTAR
4	PIPER 601B AEROSTAR
201	PIPER 601P AEROSTAR
24	PIPER 602P AEROSTAR
589	PIPER CHIEFTAIN
26	PIPER MOJAVE
301	PIPER NAVAJO
255	PIPER SENECA
74	ROCKWELL COMMANDER
168	ROCKWELL SHRIKE

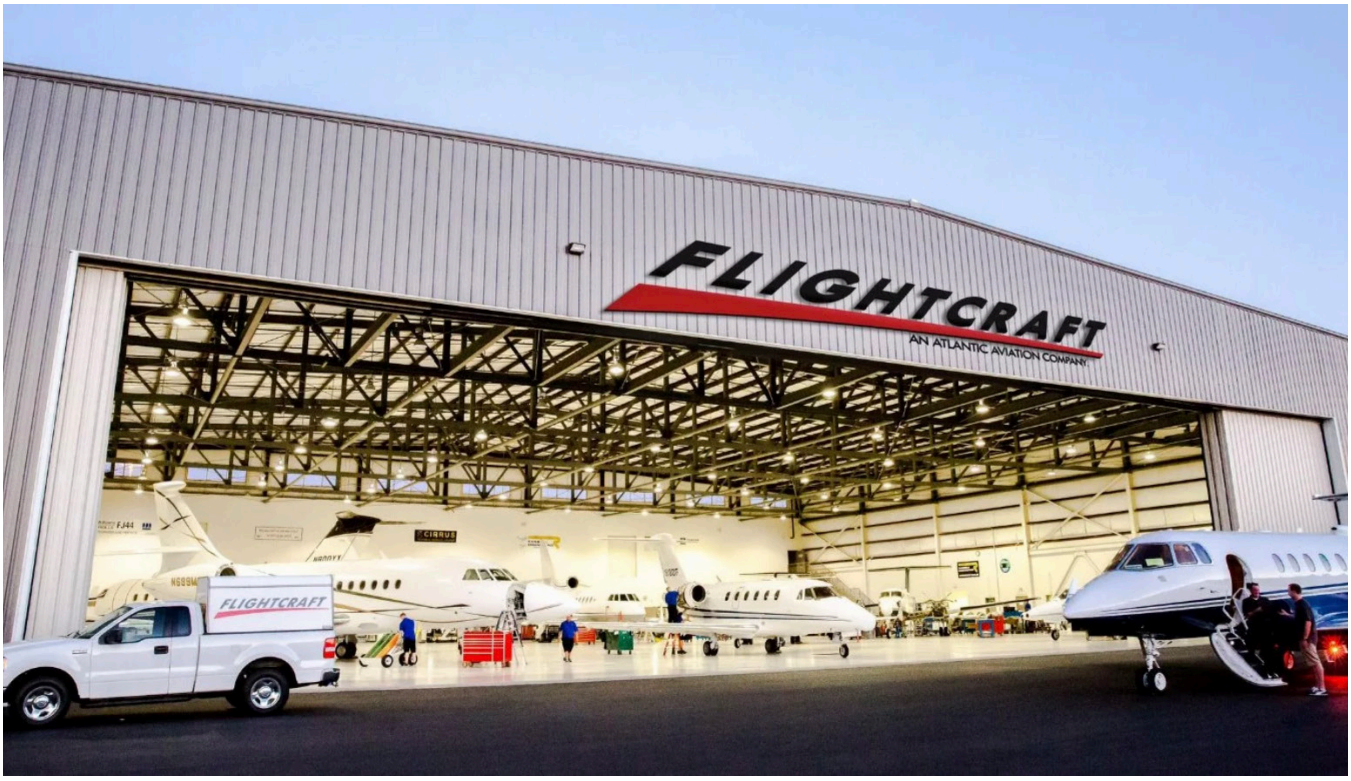
HIGH PERFORMANCE MOVE-UP SINGLES - 10,002

OWNERS

COUNT	AIRCRAFT
393	BEECH BONANZA
441	CESSNA 182
55	CESSNA 206
428	CESSNA P210N
22	CESSNA P210R
58	CESSNA T182
1220	CIRRUS SR20
3733	CIRRUS SR22
2048	CIRRUS SR22T
121	MOONEY ACCLAIM
37	MOONEY ACCLAIM ULTRA
407	MOONEY OVATION
12	MOONEY OVATION ULTRA
263	PIPER MALIBU
199	PIPER MATRIX
565	PIPER MIRAGE

Flightcraft

by **Lance Phillips**



Innovation is an oft-overused and underachieved term these days. But back in the early days of aviation, lots of Americans seemed to be running over with it. In Portland, Oregon, a few business leaders got together in the 1940s and decided to bring solutions to the Pacific Northwest's transportation challenges, forever cementing their place in aviation history and providing an enduring legacy that continues to this day.

Invention was the name of the game when Si King and Charlie Miller joined forces to lead the young aviation startup Flightcraft at Portland's newly minted super airport, now PDX. King, Flightcraft's president and manager, continually looked for ways to make moving aircraft, baggage, and people around the Flightcraft tarmac easier and safer. Meanwhile, Miller, Flightcraft secretary and treasurer, wanted to carry more in easier ways on every aircraft available. Their colleague and Flightcraft vice president, C.D. Weyerhaeuser, designed and

implemented a hangar opening, a single span of local wood, strong enough and wide enough to accommodate the long wingspans of the day.

But it's important to understand how the area got to its current airport configuration. Portland has used two locations over the years for its major commercial airport – Swan Island from 1927 to 1940 and the floodplain of the Columbia River since 1940. The second site has seen repeated adjustments of runways and expansions and upgrades of terminal facilities. As of recently, it served millions of passengers with direct flights to almost 100 domestic and double-digit international destinations.

PLANE FAX

Quick picture of
PORTLAND INTERNATIONAL AIRPORT
Portland, Oregon

Night-lighted, multiple runway system . . . weather and communications . . . CAA regional offices on field . . . complete small plane and instrument service at Flightcraft, Inc. . . . rental cars available . . . complete Standard Oil Aviation Service.

Small plane harbor
at air hub of Pacific Northwest

Si King, of Flightcraft, Inc., at Portland International Airport, tells this story of light plane service at a major airport:

"Many private pilots like a definite spot to hangar when they land at a big airport. And that's where our small plane 'harbor,' right on the field, plays an important role. Important, too, to flying businessmen is flight economy. And that's where Chevron 80/87 Gasoline stars. Our experience shows that Chevron 80/87 is the all-round outstanding buy for small plane engines. Not only does it provide top take-off power, it eliminates detonation, and proves its economy in low cruising consumption. Most of our plane owners have switched to it!

"We're located at the mouth of the Columbia River water level route to the East — and pilots from all over the Northwest converge here to fly this route — especially in winter when 'high weather' can be unpredictable. They're sold on RPM Aviation Oil, too. The reason's plain. 'RPM' has increased our overhaul period more than 20% over other top grade oils. And when we take our engines down, we find clean valves and amazingly low ring wear. Big points — because they mean better engine performance, longer life and dollars saved."

TIP OF THE MONTH

IDLE-CUT-OFF POSITION
MIXTURE FULL LEAN

Always use the idle-cut-off position of your mixture control to kill your engine. This cleans the fuel from the cylinders and reduces the chances of inadvertent starting if the prop is turned while the engine is hot or if the ignition has been left on.

CHEVRON AVIATION GASOLINE
RPM AVIATION OIL
STANDARD OIL COMPANY OF CALIFORNIA

FLYING—September 1952 9

Swan Island was a marshy, undeveloped swampland in the mid-20s. A major dredging project moved the natural island and attached it to the east bank of the river. Construction of the airport by the Port of Portland began in 1926, and Swan Island Municipal Airport opened on September 14, 1927. Charles Lindbergh, who was on a nationwide tour flying The Spirit of St. Louis, took part in the opening ceremonies. The Oregon Journal reported that Lindbergh "landed like a feather with the punctuality of a crack railroad train."

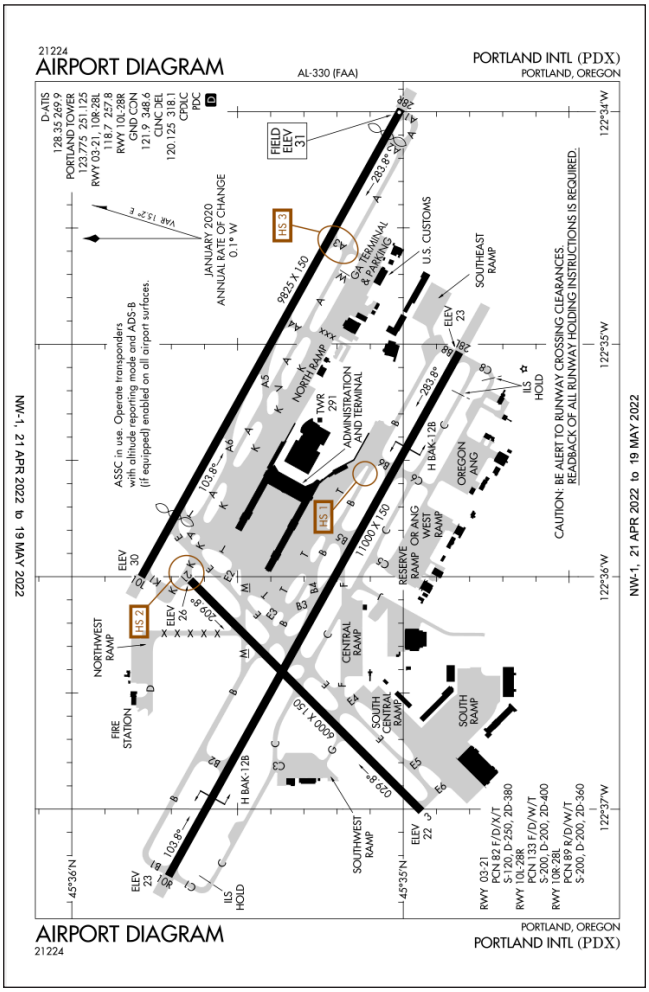
But as air travel increased and the needs of travelers outgrew the island site, it became apparent that Portland needed another airport. By 1935, Swan Island Airport had become obsolete. The small airfield couldn't easily be expanded, nor could it accommodate the larger aircraft and passenger loads expected to become common in Portland. Plans immediately were conceived to relocate the outdated airfield to a larger site.

In 1936, with a $300,000 bond issue, the City of Portland purchased 700 acres of land along the Columbia River. This, too, was marshy riverside land that needed 4 million cubic yards of dredged landfill to be usable. A $1.3 million grant from the Works Progress Administration, a part of President Franklin D. Roosevelt's New Deal, helped pay for construction costs. The Portland-Columbia Airport was completed in 1940, with its opening ceremony on October 13.

A new terminal was located off Marine Drive, with the runways forming an X toward the western side of the airport. Its location identifier, PDX, was adopted after World War II by adding X to the existing National Weather Service identifier, much like Los Angeles and Phoenix. The Port of Portland constructed a new terminal in 1959 between two parallel runways that had been newly constructed. That runway configuration remains in use, and terminal expansions and upgrades followed in 1977, 1986, 1992, and 1994.

Eight years after the new airport's opening, Flightcraft began operations. The Beechcraft Bonanza happened to be introduced the year prior, and Flightcraft was heralded as one of the early stars in the Beechcraft dealer constellation. There were as many as six Flightcraft locations at one point.

We can credit the development of the electric scoop-type aircraft tug to Si King, one of Flightcraft's founders. In 1945, Wilt Paulson founded the Willamette Aircraft and Engine Company in Beaverton, Oregon, to repurpose military aircraft for crop dusting and other civilian uses. After a move to Warrenton, Oregon, in 1948, Paulson's business morphed into the electric vehicle company known as LEKTRO. LEKTRO developed products for the logging, farming, golf and aviation industries. In 1967, Paulson and Si King got together to solve the problem caused by tow bars of the day, which often damaged aircraft nose gear when towing. Si King envisioned a system in which the nose gear could be lifted with a scoop to cradle the gear, eliminating the towbar. They created the Airporter electric towbar-less tug. Thousands were built and sold around the world, and the concept is still in widespread use today.



It was the Beech 18's height of popularity, and the Flightcraft team sold and serviced the amazing twin from its Portland facility. They operated Flightcraft out of PDX until the early 1970s when Beech Holdings bought the company to maintain its service center. Less than a year later, in 1973, Vin Manilla and David Hinson bought Flightcraft from Beech Holdings, and Hinson stayed on until 1978, when he left to start Midway Airlines. Hinson eventually was appointed to head the FAA under President Clinton.

Flightcraft was acquired by The Papé Group, a family-owned business specializing in capital equipment distributorships. It controls the distribution of heavy equipment manufacturers such as John Deere, Hyster, Ditchwitch, and Bobcat.

The Papé Group had been a Flightcraft customer, said Phil Botana, Flightcraft's previous president, and bought into the business as another capital equipment distributor with a reputation for strong aftermarket support. "What Papé found," said Botana, "was that this is a similar business but with a very different client base. Management was able to build relationships with other aircraft-operator customers – relationships that have helped the parent company prosper."

Botana said, "The partnership decided to get out of the business. It's likely the company management wanted to be in control of who ultimately took over the dealership." Botana credits his predecessor, Ernie Sturm, with building Flightcraft's business into what it had become by then. He said Papé hired Sturm when it acquired the company, and he led the business through some difficult times. We have written a lot about Beech's mid-1980s decision to change its business relationship with its dealers. Under the old scenario, Botana said, most of a dealer's profits were generated through aircraft sales. Maintenance and other support functions were not considered profit centers, and they existed at the dealer level mostly to support the sales department.

Beech completely rewrote the business model. Botana said, "The [original] arrangement led to the underdevelopment of the support market. Then when the [OEM] takes away the sales profits, it's tough to revamp and turn around the business model." Shop rates weren't necessarily intended to generate profit but to incentivize owners to buy another airplane. When it became necessary to raise maintenance rates to generate profit, customers found it a difficult pill to swallow.

> "The day I walked in the door, my singular goal was to make Flightcraft the only show around."
>
> — Brent Fraser

Sturm navigated the treacherous waters, though Flightcraft scaled back from its high of as many as six locations to its then two-facility status, with operations in Portland (PDX) and Eugene (EUG), Ore. Sturm secured Cessna Citation service center status, and revenues from the four main lines of business roughly started to break out as 35 percent for tech support; 30 percent for line service; 20 percent for sales and brokerage activity; and the remaining 15 percent from charter and aircraft management income.

After the sale to Dean Papé, the company started an aggressive expansion that would result in Flightcraft FBO and maintenance facilities in Portland and Eugene, Ore.; Spokane and Seattle, Wash.; and Hayward and Oakland, Calif. Over time, the company sold off all but the Portland and Eugene FBOs. A new FAA tower, parking garage, and canopy over drop-off lanes were completed in 1999.

Brent Fraser, Flightcraft's general manager, took a job with Flightcraft as a mechanic in 1999 but, after about a year, moved to a position as a mechanic managing aircraft for ACM Aviation in Silicon Valley. He remained there until 2009. "I always kept my eye on Flightcraft because I felt it had significant potential," Fraser said.

By 2011, Atlantic Aviation had acquired Flightcraft and rebranded its FBO businesses. However, the maintenance side of the operation retained the Flightcraft name. They wanted to build a future-proof business, and Brent Fraser was again back to lead the way. Flightcraft built new hangar facilities and left the 1950s-era wooden arches behind them.

According to AIN at the time, Fraser said, "Through conversations with colleagues, I became aware that Atlantic Aviation wanted to strengthen and build the maintenance, repair, and overhaul portion of the business, so I aggressively approached them about playing a key role in that effort. I always loved the area and the company; I watched them for ten years, waiting for such an opportunity to arise," he said.

"The day I walked in the door, my singular goal was to make Flightcraft the only show around." To do that, Fraser drew on his experience as Hawker crew chief at the KC Aviation facility in Westfield, Mass., during the 1990s. He told AIN, "I was part of an aggressive program that saw that business grow from 10 employees to several hundred. It was done by extremely hard work, never saying no, and with the determination that if we weren't able to specifically help a customer, we made sure to find a way to get it done." He employed the same strategy at Flightcraft and "the growth we've experienced to date underscores its importance."

Through Fraser's leadership, Flightcraft has grown from its two locations in Portland and Eugene, Oregon, to include another facility at BFI, Boeing Field in Seattle, Washington. BFI was established to serve a market of fleet operators, but technicians from Oregon can travel to Seattle to take care of any needs at any location.

Currently, Flightcraft maintains classic Dassault Falcon jets, along with Textron Aviation's King Air and Citation lines. Mr. Fraser said, "We've done more than just expand our capabilities to service Falcons; we've brought some of the most knowledgeable technicians available to lead the way. We offer full capabilities to keep any flight department in the air. We support our customers through decades of combined skills to give you unmatched quality in work, pricing and on-time delivery."

In addition to Falcon support, Flightcraft is a Textron Aviation authorized service center (ASC) and a Citation-certified repair station with AOG support all day, every day. Their team is made up of experts, with the 500 series Citation line having more than 20 years of Citation-heavy maintenance experience.

It is evident that now, just as in the 1940s, Flightcraft is a shining example of innovation and determination. Through ownership changes, market changes and industry changes, the leaders at Flightcraft have made the right decisions and have found new avenues to success, solving problems in unique ways. That is actually the definition of innovation. T&T

Mastery of Flight
Build Complexity

by **Thomas P. Turner**

A Garmin setup with autopilot controls on the bezel.

It's almost certainly happened to you: When you engage the autopilot, the airplane suddenly turns or pitches some way other than what you intended. This "what is it doing now?" moment is more academically known as mode confusion, a disconnect between your automation expectations and what really happens. It's usually because of a mistake in your inputs into the navigation device or the autopilot controller. An autopilot is a very accurate but very stupid copilot—it will do exactly what you tell it to do, whether that's what you wanted to do or not. At best, mode confusion is a nuisance. At the wrong time, it can be deadly.

I've introduced a lot of pilots to a lot of different types of autopilots in over 30 years teaching in piston twins. What began for me as a building-block teaching technique has evolved in the way I use autopilots myself, beginning with the basics and adding complexity from there. It puts the aircraft in simple automated control right away while giving me time to add advanced modes as desired from there.

Autopilot modes

Autopilots have two basic modes of operation: vertical modes and lateral modes. These are the two axes that make for a two-axis autopilot (to be a three-axis autopilot it must include a yaw damper as well).

Depending on the specific autopilot, vertical modes may include:

- Attitude mode (holding a constant pitch attitude)

- Altitude mode (holding a constant altitude)
- Vertical speed mode (holding a constant rate of climb or descent)
- Airspeed mode (holding a constant indicated airspeed). G1000 systems call this Flight Level Change (FLC), but it is really a constant airspeed mode.
- Altitude preselect (holding vertical speed or airspeed mode until reaching a preselected altitude, and then automatically switching to Altitude mode to maintain that altitude)
- Approach mode (following a glideslope or electronic glidepath)

Attitude and Altitude modes are easy. Hit the Altitude button when you're at your desired altitude—it's smoother if you manually level off and trim before engaging the autopilot. Or turn on the autopilot without hitting the Altitude button and it will hold your current pitch attitude. Most autopilots default to Attitude mode when engaged unless you select one of the other modes.

The possibility of mode confusion exists when you engage one of the other vertical modes. You must make additional inputs to enter Vertical Speed, Airspeed (FLC), or Approach mode. If you're delayed inputting all the variables, or if you're busy and make a mistake doing so, then the airplane may go off in an unexpected vertical direction when you hit the AP (autopilot) button. You'll have another "what is it doing now?" moment.

Lateral autopilot modes include:

- Wings Level or Roll Control mode (maintaining wings-level flight but not a constant heading)
- Heading mode (maintaining the heading under the heading bug)
- Navigation mode (following input from a navigation source such as GPS or a VOR)
- Approach mode (navigation mode with much tighter tolerances for more accurate tracking during an approach)
- GPS Steering or GPS Roll Control (navigation mode that adds turn anticipation and automatic sequencing, for example, entering and flying a holding pattern depicted by the GPS)

If you've not selected any other lateral mode, most autopilots will default to Wings Level (Roll) mode. Assuming your heading bug is set before you choose Heading mode, it will immediately hold that heading (or turn to it and hold, if the bug is not centered). Navigation and approach modes require additional programming of the navigational source, so there's an added level of complexity and consequently a greater chance of mode confusion.

Simple to complex

Just as I introduce autopilot operation to students, I've found it useful in my normal flying to engage the autopilot first in the simple modes. That gets the airplane going in the basic directions (vertically and laterally) I want, reducing my flying workload. I'll then add complexity. Here's what I mean:

Autopilot engagement

1. Before engaging the autopilot, establish the attitude and direction manually, and trim the aircraft.
2. If already trimmed in level flight, push the ALT (altitude hold) button on the autopilot mode controller. The flight director (if equipped) will engage and indicate the level-flight attitude.
3. If in a climb or descent, don't push any vertical mode buttons. The flight director command bars will match the current pitch attitude.
4. (Since I consistently use the heading bug even when hand-flying the airplane and therefore it should be centered on my current heading), push the HDG (heading hold) button on the autopilot mode controller. The flight director command bars show a wings-level attitude on the current heading.
5. Then push the AP (autopilot) button. The autopilot engages, holding the horizontal and vertical modes already selected.

Confirm each mode as you select it, and that the airplane is on the desired vertical and lateral guidance, before advancing to a higher state of complexity.

There's very little chance of mode confusion engaging the autopilot this way. Oh, you might not have the heading bug centered and the airplane will turn steeply toward the bug (don't laugh; I did this on my initial CFI checkride in a Cessna 182RG when the examiner asked me to demonstrate the old Navmatic my instructor had never let me use). But I'm a proponent of always setting the heading bug before a turn even while hand-flying, and even if you forget then following this engagement technique you'll see that in the flight director command bars (if equipped) and catch it before you turn the autopilot on.

Now that the airplane is on the attitude and heading you want, you can add automation complexity if you wish:

1. Confirm the navigation source is programmed correctly and then hit NAV (navigation mode) or APP (approach mode) as required.
2. If your airplane is equipped with GPSS ("roll steering"), in all but the latest integrated systems the autopilot must be in the HDG (heading) mode for GPSS to work. Starting—and remaining—in the heading mode is precisely what you need to do to use GPSS in many installations, but it also introduces another mode confusion possibility if your GPS is not already programmed if your GPSS is on. Leave GPSS off, enter heading mode, check the navigation programming, and then turn on the remote GPSS switch.
3. Program the vertical mode: vertical speed, airspeed/FLC, and/ or altitude preselect. Then engage the desired vertical mode.
4. Confirm the selected modes are engaged and that the airplane is on the vertical and lateral guidance you want.

By design

This technique works at what is probably the highest workload time, a missed approach. In most

installations hitting the Go-Around (GA) button (if you have one) disengages the autopilot but moves the flight director command bars to a wings level (roll control) 7° nose up attitude (attitude mode). The pilot manually flies to match this optimal initial guidance. It's then an easy two-button task (HDG and AP) to put the autopilot in these modes and confirm they're working.

Now that the autopilot is on, deal with the navigation of the missed approach procedure, including whether or when to exit GPS Suspend mode. When you've exited Suspend mode as applicable and have confirmed the navigation is set for the missed, stay in HDG if your GPSS requires, or turn on NAV if it doesn't (or you don't have GPSS). Then set your altitude preselect if you have one and have not already done so.

If you don't have the GA feature, a go-around would begin with deactivating the autopilot and beginning a straight-ahead climb—again, wings level and 7° nose up in most cases.

The typical King Air panel configuration with autopilot controls at the top.

Hit HDG and AP and the autopilot engages on your current heading at your current pitch attitude. Do all the navigation tasks and transition to more complex autopilot modes afterward.

Some of the most recently certificated autopilots, including the Garmin GFC600 now approved for many light twins and turbines, include the GA feature with a significant difference: Engaging GA mode does not shut off the autopilot. It does, however, move the flight director command bars to a straight-head, 7° nose up attitude—defaulting to the simple roll control and attitude modes—then automatically flying the airplane to that guidance. From there it's up to

the pilot to program, confirm, and add autopilot complexity the same as if you had the GA button. By design, the latest autopilots follow the build complexity technique.

Starting simple and building complexity makes mode confusion unlikely, when otherwise it could have a distracting and potentially disastrous outcome. Using this "start simple, then build complexity" technique eliminates most of the risk of mode confusion. I can truly say I've not had any "what is it doing now?" moments since I adopted this as my standard operating practice. It's a good technique for mastering automation, and the aircraft. T&T

Thomas P. Turner *is the author of the FLYING LESSONS Weekly blog (www.thomaspturner.com) that inspires pilots to pursue Mastery of Flight.™ A prolific writer, speaker and flight instructor, Tom has been inducted into the National Flight Instructor Hall of Fame.*

Ad Index

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The Bug

I am coming to the conclusion that being a pilot is much more than just a passing hobby. My recent articles about selling my Mustang and being plane-less triggered more reactions than I expected. I thought I would pass along the passion that others feel about flying, aging, and searching for the right airplane.

From Don Rood in San Diego:

"I almost never write to people I don't know, but after reading your article in the September Twin & Turbine, I felt compelled. Your story and mine (and probably lots of others) rang a familiar note. A couple of years ago, I decided to sell my 2007 Cirrus SR22T. My wife questioned my decision, but I felt it was time. I still owed a big chunk of change on it, and I was concerned about the economy. Prices were high, and I sold the plane for well over what I had paid for it ten years earlier. I reasoned that I could join the flying club and continue to fly as much as I wanted with lower costs and no loan. Selling did make us solvent, but I had no idea how much, unlike having my own plane, it would be flying rental planes. I won't bore you with the awful details (you probably know anyway).

Finally, after about 18 months, I began shopping for another plane. I succeeded in buying a 1986 Mooney M20K (252) in April this year. Now, I'm back to flying every Friday (we call it Flyday). I never realized how much I would miss my weekly "magic carpet rides" and how important it was for me to have my own plane. Since I'm 78 years old now, I know there will be an expiration date on this adventure, but for now, I look forward each week to Flyday. I hope you find a suitable replacement for your last plane soon and fly the wings off it."

From Ron Staley of Brighton, MI:

"I've read your article in Twin & Turbine for several years. Your recent "The Process" in September has so hit home. My wife and I laughed hard that we were on the same path as you. Age is ticking—grandkids we do have, out in California. We need longer legs.

I recently sold my 414A, thinking I would upgrade to a small turbine twin in the few years I have left. For every reason you list, we are with you! My search engines automatically type out the aircraft types each morning and evening, hoping that "right" plane will show up. Junk is advertised as good when it is junk. Prices are still crazy for high-demand aircraft. If I branch into other "types," I find the maintenance needs and availability would make them a less than desirable purchase, so until we find that "right" airplane, I've given up on making a decision. I'm going to have a glass of red and white. It's easier that way."

Don and Ron are eloquent in their descriptions of their passion. Flying is so much more than turning the master key or pushing the start button. It's a statement of who we are. How we live life, and how we share our love for the freedom it unleashes.

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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