Aviation Gotchas / Owner's Corner: TBM 700C2 / Tailwheel Simplicity

TWIN & TURBINE

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

NOVEMBER 2022 $3.95 US
VOLUME 26 NUMBER 11

FLIGHT REVIEW

EPIC E1000 GX

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Twin & Turbine (ISSN 1092-6402), USPS 24432 is published monthly by Village Press, Inc. with advertising offices located at 2779 Aero Park Drive, Traverse City, Michigan 49686. Telephone (231) 946-3712. Printed in the United States of America. Periodical Postage Paid at Traverse City, MI.

SUBSCRIPTIONS: *Twin & Turbine* is distributed at no charge to all registered owners of cabin-class aircraft. The mailing list is updated monthly. All others may subscribe by writing to: *Twin & Turbine,* P.O. Box 968, Traverse City, MI 49685, or by calling 1-800-447-7367. Rates for the United States and its possessions follow: one year $15.00; two years $29.00. Canadian subscriptions are one year $24.00; two years $46.00, including GST tax. Overseas subscriptions are one year $52.00; two years $99.00, U.S. funds. Single copies $6.50.

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

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NOVEMBER 2022 • VOL. 26, NO. 11

COVER PHOTO:
Photo Courtesy of Epic Aircraft

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Icing Strategy

As we enter the winter months, I've asked T &T contributor and safety expert Thomas Turner to provide strategies regarding cold-weather flying and icing conditions. For additional icing tips and tales, readers can also reference articles found in our November 2021 issue (available online).

We all want maximum utility from our airplanes. We don't want to have to limit a non-ice-certified airplane to VFR-only operation in the wintertime. Even in airplanes approved for flight in ice (so-called FIKI airplanes), we need to fly within the limits of that certification. Although recent years have brought us tremendous advances in icing forecasts, there is still no Stormscope or Strike-Finder equivalent for airborne ice detection. You don't know you're in it until you are, and you can't predict how heavy the ice will be until it accumulates.

FAA Advisory Circular (AC) 91-74B, "Pilot Guide: Flight in Icing Conditions," states a "thin ice accretion on critical surfaces, developing in a matter of minutes, can sometimes have dramatic effects on stall speeds, stability and control. Wind tunnel testing indicates that if such accretions are particularly rough, they can have more adverse effects than larger accretions that are relatively smooth." That, and the fact that ice is very unpredictable and varies rapidly, is the hazard of flight in clouds and visible moisture when the temperature is near or below freezing.

So how can we get maximum utility from an airplane in cold-weather conditions?

In airplanes not approved for ice:

- Fly VFR and remain clear of all clouds and precipitation.
- If you elect to fly IFR, avoid flight in freezing temperatures (from about +5˚C to -15˚C in stratus clouds and as cold as -40˚C in cumulus).
- Ask for block altitudes or request a VFR on Top clearance to remain in ice-free air, but only if you can climb and descend to those altitudes without entering clouds in the ice-likely temperature range.
- Remember that even if your airplane has the power to climb through unexpected ice, eventually, you may have to come back down into it.
- Take icing PIREPs seriously.

In airplanes with FIKI approval:

- Treat the first wisps of ice accumulation the same way you'd react if you unexpectedly heard the stall warning horn – do something NOW to eliminate the problem. Climb, descend, or turn to ice-free air... don't try to ride it out if you can escape, even if the paperwork says you're legal.
- Any mention of supercooled liquid droplets ("SLD"), means enough liquid moisture is suspended in the atmosphere to invalidate even "known icing" certification. SLD potential you cannot fly around, or under at temperatures well above freezing, is a no-go item.

In all aircraft:

- If you have an encounter, file icing PIREPs, so the system works for the next pilot.
- Figure icing delays or cancellations into your trip planning. If you pre-plan for flexibility you'll be less likely to be pressured into making a bad decision.

You wouldn't fly into a line of towering cumulus that is alive with lightning and extreme precipitation; you'd fly completely around it, delay your trip or cancel altogether. That's a reality of flying during thunderstorm season. Icing is exactly the same – except we have no good way to actually detect ice location, type or intensity. So we have to be even more conservative to avoid encountering ice.

Many Pilot's Operating Handbooks carry the limitation "flight into icing conditions is prohibited." Those that list approval for flight in ice have certification limits on when that approval is valid. These limitations are not negotiable. The good news: Warmer weather is only a few months away. T&T

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

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Back to Simplicity

by **Kevin Ware**

I was walking down the flight line at our local airport, returning from the FBO to my hangar, when I came across a brand-new-looking Cessna 180 with the owner busily polishing. With the sunlight sparkling off the fuselage, I could not help but stop and very impolitely stare at the airplane. I found the owner (Tom) to be an old acquaintance, a fellow former corporate pilot and businessman who had previously owned various turbine aircraft, including a Citation.

Tom's Cessna 180 was pristine, and we talked about the effort and expense required to bring it to that condition. After a while, I could not help but ask if he missed flying all the fancy, pressurized aircraft he previously owned, most of which I was quite familiar having flown them myself. To my surprise, he said, "No, not at all." He went on to say at age 72, having flown everything else in earlier years, the simplicity of flying this fixed-gear taildragger in nice sunny VFR weather is exactly what suits his fancy. So much so, he said, that he has spent an outrageous amount of money on this 180. He so enjoys the simple, minimal stress form of flying that he could never see replacing it.

This got me thinking about what has been the most relaxed flying I have done over the past 50 years and 11,000 hours. The first flights that came to my mind were in a 65-horsepower Piper Cub, devoid of any electrical system or radios. In my late teens and early 20s, I flew the Cub all over south Florida for $3 per hour while building time for higher ratings. After having someone help prop the airplane to start, and with the doors always open, I would wander off over the Everglades and Florida Keys below 1,000 feet just exploring wherever the little airplane wanted to take me. With the doors open, there was a slight smell of exhaust, but that was generally overcome by the salt marsh smell from the Everglades and farm fields just 200 to 300 feet below.

There was no flight plan or time schedule in the Cub. No controllers I had to talk to or altimeters that needed to be reset at FL180. No passengers asking where the coffee creamer was and expecting to be somewhere distant at a precise time regardless of weather. The only determiner of how long the flight in the Cub would last was the bent wire sticking out of the

gas cap just in front of the windshield that was attached to a cork in the gas tank. When the wire was down to the last inch or so, it was time to look for a place to land. At that time, filling up with 80 octane gas rarely cost more than $1.25 per gallon. Ah, the freedom and simplicity.

Some years went by, and I slowly moved onto more complex and faster aircraft, some owned by me, others owned by various corporations for which I flew professionally. But as time passed, just like my friend Tom, I found a desire to return to simple flying.

To a certain extent, helicopters can provide this. They fly low and slow and almost always VFR. For more than a decade, I owned and flew an R44 from Alaska to California at or below 1,000 feet, landing wherever it looked attractive. With time, however, I realized as enjoyable as this was, it was not the same as the old Piper Cub. The main difference is the mechanical complexity and noise level of the helicopter. There are many moving parts over your head and behind you in a helicopter, and they all have to work perfectly for the flight to be successful. This starts to play on your thinking after a while. A preflight in a helicopter is not an activity to be done quickly or taken lightly.

Helicopters also have a series of limitations you get accustomed to after a while, but they still detract from the simple joy of flying. For example, in helicopters, there is something called the "height/velocity" envelop, also quite appropriately known as the "dead man's" corner. This is an area starting at about 20 feet above the ground up through about 100 feet, in which hovering or flying slowly (say below 60 knots) is quite dangerous. If the engine quits from that low altitude without sufficient forward speed, there is not enough energy in

"Interestingly, the activity of restoring a very simple, single-engine, fixed-gear, piston-powered, 40-year-old Cessna to essentially new condition was a very satisfying experience."

The C180 received a complete makeover.

All round dials were replaced with Garmin flat panel displays.

the rotating rotor system to cushion the touchdown that inevitably follows. The outcome is sort of like stalling an airplane at 50 feet above the ground.

So after flying helicopters until I satisfied that itch, I started to think about other types of flying that were truly relaxed and casual. What also came to my mind was the float flying I had done some 30 to 40 years ago. After getting my float rating back in my 20s, I spent several hundred hours instructing in those airplanes. Most often the instructional flights were in underpowered Taylor Craft. But they at least had electrical systems and starters, so we didn't need to balance ourselves out on the end of the float, hand-propping the machine from behind the propeller.

The freedom to land on the water pretty much anywhere we wanted impressed me almost as much as flying over the Everglades in the Cub five years before. A couple of decades later, when I was living in a big house on a large lake and no longer dirt-poor, I decided (like several of my neighbors) that having a float plane tied to the dock in front of the house would be a magical thing to do. So I bought a Cessna 185 on Edo floats and spent 10 years flying it throughout the Northwest and into Canada, all VFR and generally below 1,000 feet. With time I found the only problem with this was getting fuel.

In the Seattle area at the time, there were only two places where you could fuel a float plane. One was in Kenmore at the north end of Lake Washington, the other at Renton, at the far south end of the lake. Now, the lake I lived on happened to be 30 to 50 miles north of those locations, and deadheading down there to get fuel before departing on a northbound trip got to be kind of old. I started looking for a set of amphibious floats to fix this problem, but other life events intervened, and we wound up moving off the lake before I could pursue that. The other tricky thing I remember about flying floats was trying to dock the airplane in a tight spot when the wind was blowing without embarrassing myself. Traditionally, float planes (unless turbine) do not have brakes or reverse thrust…this can make for some tense moments.

Then there passed a period where I personally owned several different multi-engine airplanes, the last being a Cessna 340, which we flew most often in the low flight levels IFR all over the continent. I also returned to flying professionally, but nearly always in turbine aircraft, often Lears and Citations. This was interesting, but from FL450 at night, you really don't see much, and the pressurized cabin smells like whatever the passengers in the back are drinking. Not at all like the Everglades just 200 feet below in the Piper Cub. Ah, for the simpler days.

So, while still owning the C340 and the R44, I started thinking about

Aerocet 3500 model amphibian floats awaiting installation.

buying a simpler aircraft. I looked closely at Carbon Cubs, but now with eight grandkids, the two-place cockpit seemed inadequate. That led me to a Cessna 180 or 185 search. I eventually found and bought one late last year, promptly sending it to Upland Aviation in Chilliwack, BC, for a "complete makeover" as they say in the cosmetics business. The process turned out to be fraught with frustration and delay, but that is another story. Also, not wanting to completely submerge in the bath of "simplicity," I had Lawrence Liu of Trilogy Avionics remove the instrument panel in order to replace all the instruments with glass and install a new Garmin autopilot. During a visit, Lawrence proudly displayed the new panel cut out for me…strangely only two round holes.

Interestingly, the activity of restoring a very simple, single-engine, fixed-gear, piston-powered, 40-year-old Cessna to essentially new condition was a very satisfying experience. So much so that I found all my airplane time now involved messing around with the 180, so I sold the 340. And truthfully, just like Tom, I have not missed the flight level pressurized flying much at all. My thinking is surprisingly similar to many retired airline pilots: "If you want me to do that kind of flying, then I will need to get paid."

The next thing I did in pursuit of simplicity was drive out to Priest River, Idaho, and visit Tom Hamilton's Aerocet aircraft float factory. They have a bunch of very skilled and enthusiastic fiberglass float builders out there who do excellent work. After looking their product over and recalling the problems I had getting fuel for my old C185 on floats, I ordered a set of the 3500 model amphibs. They are currently sitting on their four wheels waiting to be attached to the C180.

The bottom of the fiberglass floats is slick as it can be, which results in a great reluctance of the airplane to slow down on the water once power is reduced. Remembering this problem from my old C185 on straight Edo, even with all the rivet heads sticking out of the bottoms, I ordered a reversible MT propeller which is also waiting to be installed. Slick floats notwithstanding, all my encounters with the dock should be very gentle.

Now, this may not entirely match the simplicity of my Piper Cub days over the Everglades or flying underpowered Taylor Crafts on floats. But, on the other hand, I will not have to hand prop the C180, I will be able to stop the airplane as it rushes up to the dock, and at least four or five of my grandkids can fit inside. Maybe there is such a thing as too much of a return to simplicity. I will let you know. T&T

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Aviation Gotchas

by **Stan Dunn**

We tend to think of a "gotcha" as a sneaky way of being tripped up. Something that a disgruntled examiner does to make life hard. This may occasionally be true, but most of the serious errors in aviation result from situations that fool us into poor responses. Nobody wants to crash. When it happens, it is almost always the result of a circumstance that has caught a pilot unaware. It could be weather or a mechanical issue. It could be due to a lack of proficiency on a particular approach or a misunderstanding in communication. Sometimes we simply get distracted and make a mistake. The truth is we already know most of the things that can get us into trouble. As it relates to pilot error, a century's worth of human flight has already revealed pretty much every way that we can get it wrong.

Pay Attention to Your Velocity

Airspeed. There are a dozen different limitations associated with it: V_{no}, V_{ne}, V_a, V_s, flap speed, gear speed, approach speed, V_{ref}. There is a reason for this alphabet soup of speed limits. It is the lifeblood of a fixed-wing aircraft. Nothing works without airspeed. Too much of it is better than too little, but not by much. Too slow and you lose control. Too fast and important components depart the airframe. Aviation begins and ends with speed. Not only do you need it to be safe, but it is also the primary reason why we fly (it is hard to justify the cost if you are not saving time).

Your airspeed should always be central to your instrument scan. During climb and approach, you should look at your airspeed indicator frequently (when changing power or configuration, you should scan it at least once every five seconds). Airspeed awareness is most important when communication requirements are at their highest. In the middle of this high workload environment, the margin for error is low (climb and approaches represent the lowest speeds we operate while aloft). There are a dozen different ways to get distracted while low and slow. Flub an ATC call, turn to a wrong heading or overshoot an altitude, and you will

You can trap many gotchas with a detailed preflight inspection.

Technologically sophisticated aircraft have improved aviation safety overall, but nothing replaces the value of basic piloting skills.

almost certainly survive (it is a very big sky). Lose track of your airspeed and the odds of survival rapidly diminish.

If you accumulate ice, the carefully considered aerodynamics of the engineers goes up in smoke. Airflow separation will occur at a lower angle of attack (AOA). Stall speed is higher. Drag and weight increase as well. Performance is degraded. Many manufacturers dictate a minimum speed for operation in icing conditions. Follow it like your life depends on it (it does). If you have any doubt fly faster. Remember that extra airspeed requires a longer rollout on landing (tailwind additives provide a quick means to assess how much extra runway will be required – carrying an extra knot of approach speed is the same as experiencing an extra knot of tailwind). Choose a longer runway if you need to, but keep your speed up. Going slowly off the end is better than a spin at low altitude.

The Trick with IMC

IMC accidents result in fatalities two-thirds of the time that they occur. This is a much higher rate of fatalities than is found in other types of accidents. In 2004, 6 percent of all accidents occurred in IMC. The relatively high rate of fatalities in those accidents produced an outsized 25 percent of all fatal accidents. These numbers have been fairly consistent over the decades. The NTSB published an in-depth study on the issue in 2005. This study piggybacked a technique that was formed during the investigation into the JFK Jr accident in 1999. The NTSB identified and interviewed other pilots who had operated in the same area at the same time as the accident flight. The hope was to identify the specific differences between those who successfully traversed areas of IMC versus those who perished.

The study captured data from 72 accident flights. This was contrasted against 135 non-accident flights (which had successfully operated in the same conditions at the same time). The FAA provided the results of practical and written tests associated with the accident pilots. The NTSB also reviewed incidents and enforcement actions connected with them. Comprehensive as it was, it was far from the first paper that had been published on the phenomena of IMC fatalities. Studies in 1968, 1974, 1976, and 1989 also sought to discover why pilots keep dying in the clouds. For their part, the NTSB issued 82 recommendations related to IMC operations between 1968 and 2004.

The study determined several trends associated with accident pilots. These pilots were older than average. While a majority of the accidents involved non-instrument-rated pilots, a striking number involved those with advanced ratings. VFR flight into IMC was the main cause of accidents for non-instrument-rated pilots. Continuing an approach below minimums was the bane for the IFR crowd. Plan continuation error (a phrase coined in the study) is defined as the "failure to revise a flight plan despite emerging evidence that it is no longer safe to continue." In the face of deteriorating weather, continuing with the original plan can result in a potentially dangerous outcome. Yet this personality trait is ever-present in aviation. Unlike other errors that are inversely related to the number of flight hours a pilot possesses (i.e., fewer hours equals higher risk), continuation error tends to increase in proportion with flying experience. High-time pilots are some of the worst offenders.

At my previous employer, Flight Operations Quality Assurance (FOQA) data indicated, in one year, well over a thousand unstable approaches. The total number of these events was not really the issue (the data covered hundreds of thousands of flights), but rather the fact that only four go-arounds were accomplished out of the thousand-plus events. Our "professional" pilots proved to be highly resistant to modifying their original plan (executing a landing) when faced with emerging evidence that it was no longer safe to do so (an unstable condition). In aviation, the process is sometimes more important than the outcome. Safe on the ground following a go-around represents a success. Continuing a marginal approach is a failure – even if you manage to salvage a successful landing.

The causes of accidents are similar across different aircraft types. The primary difference between "low and slow" and "Mach cruise" is the speed at which things happen.

The Training Environment

Very few examiners get on the "gotcha" train because they enjoy writing pink slips. In most cases, the gotchas are introduced in order to see if the applicant's knowledge can correlate to an out-of-the-box condition. When I was an examiner on the Embraer 170, training data indicated poor performance during recurrent check rides on non-precision approaches (localizers in particular). There were two possible reasons for this. The first was a lack of preparation by pilots prior to the check ride. The second was a lack of recency (LOC approaches – especially at big airports – typically occur only following a failure of the glideslope on an ILS, a relatively rare occurrence). There was debate within the training department as to the degree to which we should brief the LOC approach prior to an event. If our pilots were simply unprepared, we wanted them to experience discomfort during the check ride. If they couldn't handle an approach they knew they were going to get in the simulator, how prepared would they be when they encountered it unexpectedly in the air? On the other hand, if they were simply rusty, we wanted to give them pointers to help them out. The localizer approach was already a "gotcha" for our crews. The question was, "How much training should occur during a checking event?" The answer is quite a bit more than you might think.

A successful check ride (particularly one that establishes a new rating) is not the end of learning. Rather, it is the beginning of the most dangerous phase of a pilot's life: gaining experience in an increasingly complex environment without a safety net. The paper ticket the examiner gives you conveys the legal ability to operate. It does not mean that you have nothing left to work on or anything left to learn. It simply means that you have obtained the knowledge and skill necessary for a fair shot at surviving the never-ending series of learning experiences that aviation provides.

The training environment is a critical component of safe flight. Not only do the FAA and NTSB recognize this, but so do insurance companies. The statistics are simply too compelling to ignore. Recurrent training is a cure for pilot error much like sleep is a cure for fatigue. The failure to

proactively apply the antidote increases the risk of a devastating error at an exponential rate. Sometimes sleep is not convenient. The same can be true of training. But both are major contributors to the safety record. And the proliferation of technology has made self-training easier than ever. It is remarkable how much proficiency you can gain with a PC and a flight simulator. You just need to set aside the time.

Most check rides begin with a knowledge validation. It is important to understand the high points of regulations and aircraft systems in order to safely function in the air. Here is a little secret to orals: Your examiner knows within the first five minutes whether you will pass. If you know your aircraft limitations by heart, understand the guiding principles of airspace and weather, and can figure out weight and balance without too much heartburn, you will be in good shape. Nobody expects perfection. You just need to be able to demonstrate that you have, at the very least, the basics covered.

It is nice to be able to describe the fuel system to the nth degree, but so long as you have the high points (how to check for contaminants, how much you need to carry), you will most likely survive both an oral and an average flight. Still, it is better to aim high than for the bare minimum. That said, unused knowledge erodes quickly, so memorizing an entire manual is a fool's errand. If there is a knob or a switch that can be operated from the flight deck, it is good to know exactly what it does. Otherwise, being able to effectively reference the information in the Aircraft Manual is enough for the sake of safety.

Being prepared for an event will not only facilitate a less stressful check ride (not to mention the ignominy of a pink slip), but it will also make you a better pilot. And while nearly all pilots place a focus on reviewing regulatory and systems knowledge in anticipation of a training event, it is equally important to keep fresh during day-to-day life. A periodic review of aviation subjects produces greater clarity and confidence when operating an aircraft. Be sure to take the regulatory environment seriously. The FARs were written in blood. Do not add a chapter of your own. Remember the most damaging gotchas are often generated from fundamental mistakes.

Go fast, but not too fast. Stay out of the soup unless you are current and rated. Go around if you are unstable. Review any material that you are not current with. When things get swirlingly complex in the air, simplify. Watch your speed, maintain a stable attitude, and get vectors to a safe location where you can chew on alternatives. There are very few situations in an aircraft requiring a rapid decision. If you get confused, focus first on flying the aircraft. Once you are stable, take a breath and consider your options. Perfection is elusive. Operating safely is not. T&T

Stan Dunn *has 8,000-plus hours in turbine-powered aircraft, with three years of experience as an instructor and evaluator for airline pilots. Stan publishes detailed coverage of aviation accidents at bellmanmultimedia.com/flying. You can contact Stan at* **Stan@bellmanmultimedia.com**.

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FLIGHT REVIEW

EPIC E1000 GX

by **Matthew McDaniel**

Comparing airplanes to horses has been a mainstay in both aviation journalism and aircraft naming. Evoking the image of fast or free-spirited horses seems to help sell airplanes. No one ever compares an aircraft to a draft horse. Yet, to me, Epic's E1000 GX is a hybrid galloping racehorse and heavy hauling draft horse. No other aircraft in this class can heft such loads to such altitudes then run at home-stretch speeds for the entire remainder of the race.

Like a racehorse, the Epic's lines are sleek and graceful. The E1000 GX's steeply raked windshields, aggressive five-bladed prop, and smooth glass composite surfaces hold your gaze longer than is probably considered polite. But, it is no diminutive pony. Its semi-elliptical wing spans 43 feet, and the average pilot can easily walk under the fuselage-mounted horizontal tail. The tip of the rudder towers 12.5 feet high. The aircraft could easily accommodate eight but is configured for only six. The cabin's four passengers enjoy a club seating arrangement that does not require them to interlace legs with the person facing them. In fact, the floor length between the club seats is almost double that of the two most comparable in-class competitors. Behind the last row of seats, an ample baggage area inside the pressure vessel allows access to baggage in flight.

PHOTOS BY AUTHOR

Epic's E1000 GX demonstrator inside their Bend, Oregon, delivery center hangar.

Massive double-slotted fowler flaps are elegant in form and powerful in function.

Cynical History

I admit I can sometimes be cynical about new aircraft designs and the upstart companies who introduce them. After all, how many have we seen come and go over the years? They often wow us with aesthetically pleasing artist renderings (or even a prototype) and eye-popping performance claims, only to fade away as suddenly as they appeared. Sometimes it is simply a matter of funding that dooms them. Other times it's an inability to match early performance or price claims that causes their eventual demise. Usually, it's a combination of both.

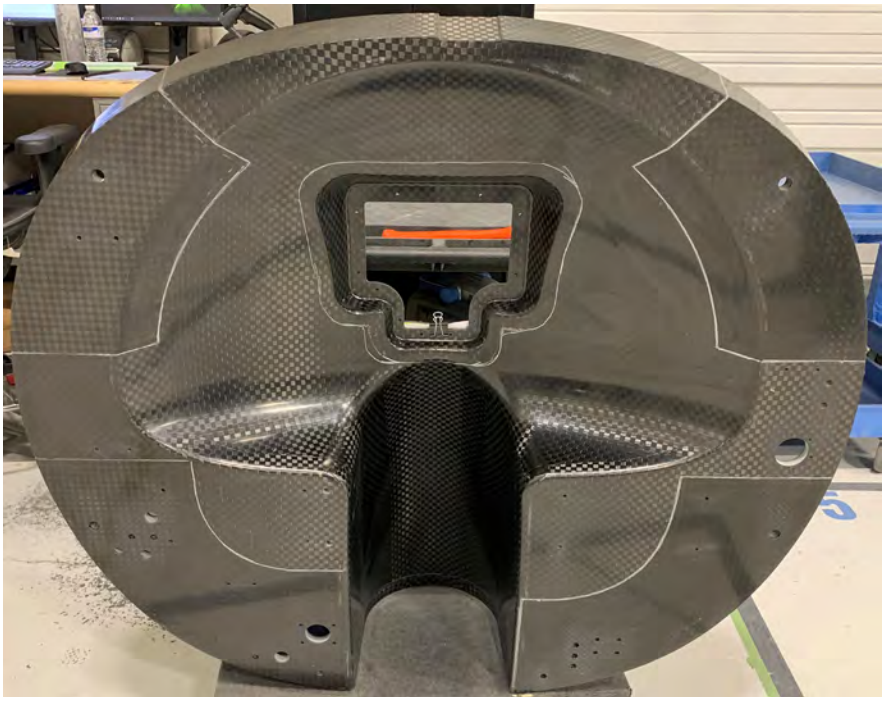
So, when I first saw a completed Epic LT kitplane in the mid-2000s, I was conflicted. It was undoubtedly a sleek machine, but it was still a kit and a daunting one at that. How many builders would persevere in putting daylight under its tires? In a story all too familiar, Epic went bankrupt in 2009. It seemed the design would soon go the way of the Dodo. Thankfully, a group of Epic owners/builders (including the current CEO, Doug King) joined forces with a Chinese company to buy the assets and soon reopened the Bend, Oregon, factory to produce kits and assist builders. Subsequently, they announced their intention to pursue certification and manufacture ready-to-fly aircraft.

In spite of those early turbulent years, the LT kits have been incredibly successful at reaching flight status. Because Epic only sold kits bundled with their builder assist program, every one of them eventually flew. Of those 50 or so LTs, all but a handful remain airworthy (and factory-supported) today, even though Epic ceased kit sales in 2012 to focus on certification of the E1000 model. What other kitplane company can you think of that had a nearly 100 percent completion rate on kits sold? None that I know of. However, producing kits and assisting builders is a far cry from producing and delivering certified aircraft. Especially, a cabin class, pressurized, turbine machine capable of 300-plus knot speeds and cruising altitudes deep into RVSM territory.

Ownership of the company changed once more as it separated its kit-owner support and certification arms (Epic Flight Support and Epic Aircraft, respectively). Type certification of the E1000 was achieved in late 2019, with first deliveries and production certification following in mid-2020. The enhanced E1000 GX was certified in July 2021. Major design changes to reach those milestones never materialized. Nearly every aspect of the design was refined, of course, but the company stayed true to its goal of keeping the performance and handling of the E1000 on par with that of the LT. Thus, Epic Aircraft now builds the fastest certified single-engine turboprop in production and delivers a new one every three weeks.

Considerate Compromises

I can hear my fellow skeptics already: "It's all too good to be true." Aircraft certification programs always add weight and subtract performance. It's just in the nature of ensuring an aircraft meets minimum certification standards for durability, maintainability, and control. The Epic is not an exception to that rule. The typical empty weight of an E1000 GX is 500 pounds or so heavier than that of an LT. Some of that weight is in structural



The primary carbon-fiber construction material makes up all major structures, all flight controls, trim tabs, cabin panels and flooring, most fairings and trim pieces, and even the firewall (shown here).

beef-ups required to meet certification standards for redundancy and crashworthiness (which allowed the E1000 to achieve certification in the tougher Utility Category). But, much of that weight is in interior improvements added because Epic wanted to, not because they had to.

Soundproofing and vibration dampening was added throughout the airframe, making it the quietest and smoothest single-engine turboprop I've flown. The airstair door was revised and, when opened, interior courtesy lights switch on to ease loading when the aircraft is otherwise unpowered. A secondary emergency exit was added, and the large windows got an electronic dimming feature. Significant flight deck enhancements were also added, resulting in an incredibly ergonomic design that lowers pilot workload and increases safety from the adjustable glare shield down to the auto-switching fuel selector. Critical to offsetting these weight-adding features and boosting performance was the enlargement and reshaping of the engine intake to better optimize air induction.

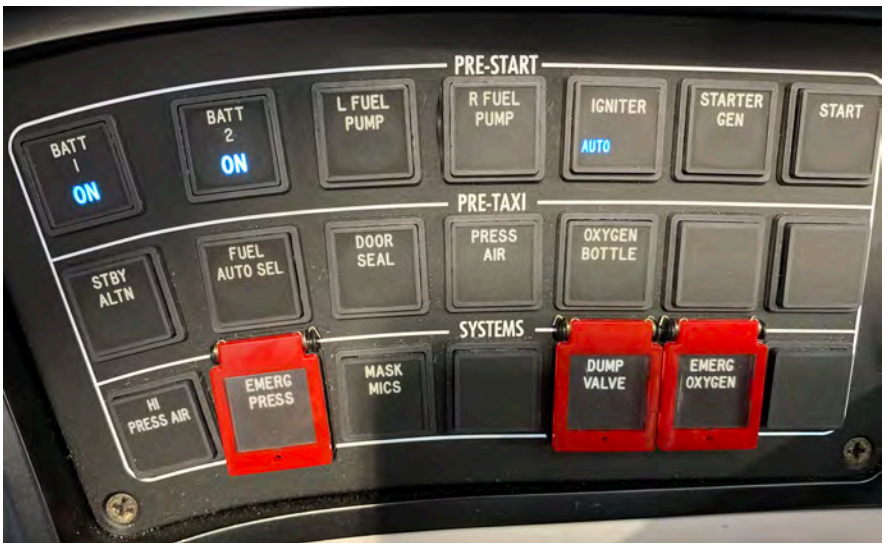
The advantage Epic had in retaining its performance pedigree throughout the 7-year certification effort was not about what it ended with but what it began with. Specifically, power. A lot of it. From day one, Epic's business end has harnessed the trusty Pratt & Whitney PT6A-67A turboprop, sporting 1,200 SHP. It is not takeoff limited as in some other single-engine turboprops in this category. All 1,200 horses are available to the pilot through takeoff and initial climb, and 1,000 of them are available continuously (thus, the E1000 designation). With so much power available, the certified model could afford to gain a little "maturity weight" and still be a thoroughbred performer.

Combine that with prop and engine airflow refinements made to improve thrust output, and the E1000 GX retains the same bragging rights as its LT brethren. In some areas, it even bests them. E1000 GX pilots can fill the tanks (264 gallons usable), fill all six seats with FAA-standard size adults (with some payload left over for baggage), climb at 3,000 to 4,000 FPM to FL340, and then cruise north of 315 KTAS in the 50 gallons per hour (GPH) range.

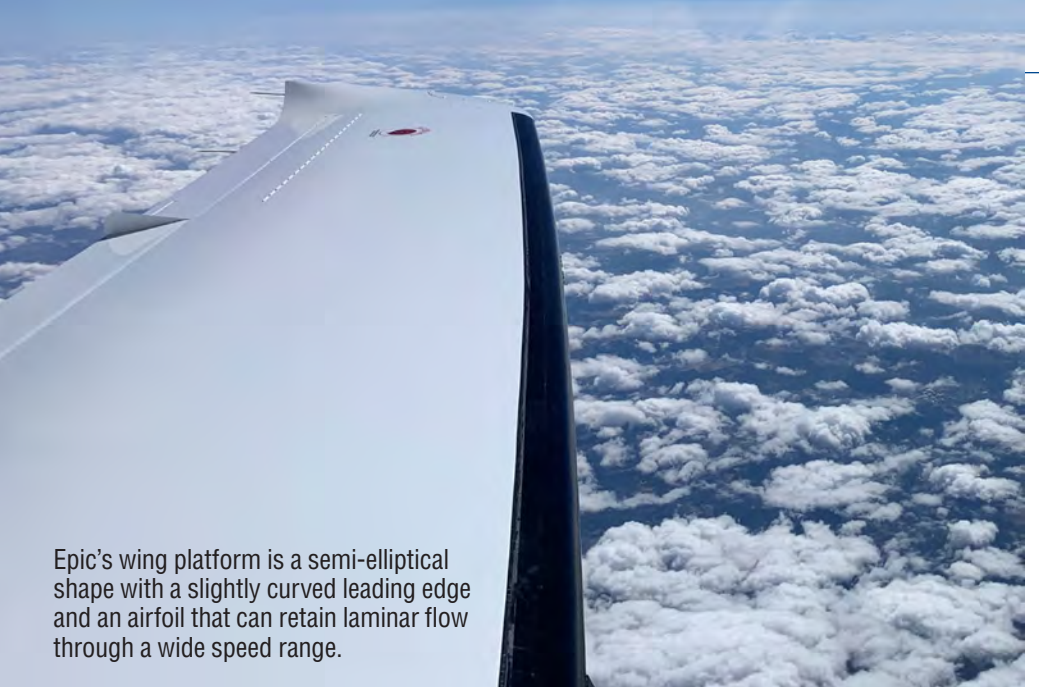
Flying the E1000 GX

It took me over a year to connect with Epic's Flight Training Program Manager, Peter King (no relation to CEO Doug King). A pandemic, crazy work and flight schedules, 2,000 miles of separation, and demands on Epic's working fleet of aircraft made making all the stars align difficult. It was worth the wait!

Peter King is a highly experienced flight instructor, flight test pilot, and Garmin avionics guru. Our aviation paths have crossed many times in the past couple of decades, so there was an easy comfort between us as he walked me through a preflight. We talked about such arcane topics as Boundary Layer Energizers (BLEs), span-wise flow control devices and optical ice detectors (all of which the E1000 GX



One example of the design of the various E1000 GX's subpanels, organized into logical rows and groups with sequential button placement to create easy workflows.



Epic's wing platform is a semi-elliptical shape with a slightly curved leading edge and an airfoil that can retain laminar flow through a wide speed range.

has). Once we settled into the flight deck, it was immediately obvious that actual pilots had significant input into the layout. All normal workflows are logical: left to right for startup and taxi, right to left for after-landing and shutdown. None of the nonsensical patterns I've experienced in so many aircraft types over the years.

All the switches (actually backlit push buttons), as well as avionics, flight, and engine controls fall easily to hand. The seat is easily adjustable for optimum pilot eye position. The avionics screens and subpanels all have similar focal lengths allowing pilots with aging eyes little trouble adjusting focus from one viewpoint to the next. One of my favorite features was the recessed panel directly in front of each pilot, known as "the wedge." It contains an AOA gauge, gear and flaps position lights (including an amber TRANSIT light), and a takeoff configuration checklist. By simply holding down the throttle-mounted TOGA button this checklist illuminates. Any red item is not correctly configured for takeoff. Once the button can illuminate the list as all-green, all critical takeoff items have been properly set.

Of course, like any pilot, I'd hoped to experience Epic's well-publicized performance numbers. Yet, even with high temperatures and short stage lengths conspiring to foil that, I was still highly impressed. With OATs at a whopping ISA +24F at the surface, we departed Bend around a thousand pounds below the 8,000 lbs MGW. The long rudder arm and huge rudder trim tab make counteracting the massive left-turning tendencies that 1,200 SHP produces very manageable. Don't forget to release the right rudder pressure and re-trim towards center quickly after liftoff, though, or the rapidly increasing speed will quickly humble the pilot with an inclinometer ball pegged to the left. Nothing a bit of practice won't overcome, of course, but getting the yaw damper (with its automatic rudder trimming capabilities) engaged early in the climb is helpful too. By the time we'd reached midfield on our VFR downwind departure, we were 5,000 feet AGL. We could easily maintain 3,000 to 3,500 FPM at (or even slightly above) V_y IAS, making it obvious that Epic's claims of 4,000 FPM climbs are not unrealistic in ISA conditions.

Typical flight maneuvers exhibited the E1000 GX's beautiful handling qualities. Pitch and roll are well harmonized and just heavy enough to not be twitchy. That powerful rudder is more sensitive, however, and requires a lighter touch (but, in most flight conditions, the yaw damper will be managing the rudder for the pilot anyway). Steep turns up to 60-degrees bank were a pleasure. Stalls are a total non-event thanks to the robust warning and recovery systems (including a stick shaker and, for the truly inattentive pilot, a stick pusher). Of course, a simple lowering of pitch combined with having 1,200 SHP on tap makes for a quick recovery.

Epic has chosen to stick with the Garmin G1000 NXi avionics suite. In the E1000 GX model, the system is mature, feature-rich, and incorporates dual 10-inch PFDs, a central 12-inch MFD, a data-entry keypad, and multi-layered redundancies. Garmin's GFC 700 autopilot also replaces the previous S-Tec 2100 model used in the original E1000 and mounts it under the glareshield. The GFC 700 incorporates everything we expect in this modern age of integrated digital avionics: full VNAV capabilities, full WAAS approach coupling, and fully coupled missed approaches.

Our first approach was a GPS WAAS (LPV) full procedure from the Initial Approach Fix (IAF). The G1000 NXi's VNAV system made the descent from cruise altitude a breeze, including meeting multiple crossing restrictions. Initial flap and gear extension requires little adjustment by the pilot. Landing flap extension, however, is a different affair. That additional flap throw is a whopping 31 degrees (from 12 down to 43). Initially, a subtle push on the yoke is sufficient to counteract the double-slotted fowler flaps as they extend mostly aft. But, as they begin to droop, dramatically increasing drag, a more forceful push is required to maintain the glidepath. Of course, the autopilot can do all this with aplomb if left coupled. For missed approaches, simply push the TOGA button to properly sequence the G1000 NXi. Follow up by advancing the throttle to takeoff/go-around power and cleaning up during the ensuring rapid climb and acceleration (the yaw damper will take care of the right rudder needs, assuming the A/P is fully coupled throughout the missed approach).

We made a quick return for a practice landing, where I under-flared a little and landed a bit flat, but found the E1000 GX easy and predictable to control. Returning for departure, taxi speed was easily controlled without brakes by manipulating prop pitch into the Beta range. During the subsequent departure, we picked up our IFR flight plan to Seattle's Boeing Field and

zoomed up to the assigned cruise altitude of FL260 in a matter of minutes. With the temps still well above ISA, the PT6 unsurprisingly reached its ITT limit slightly before we got there.

Epic advertises a top cruise speed of 333 KTAS, which would be most likely in this altitude range. Yet, in ISA +10 temperatures, we settled in at 324 KTAS max cruise. So, on an ISA day, 333 KTAS seems entirely realistic. While max speeds are more likely in the mid-to-high 20s, fuel flows will not be optimal there. The savvy E1000 GX pilot will take advantage of its amazing climb rate to get to the top floor (FL340) as quickly as possible, where peak efficiency can be achieved. At FL260, we were consuming 67 GPH at 324 KTAS (max cruise) and 64 GPH at 321 KTAS (normal cruise). In comparison, at FL340, E1000 pilots routinely report fuel flows in the 48 to 50 GPH range while cruising at 315 KTAS.

The descent into BFI was as stable and predictable as the combo of G1000 NXi avionics and GFC 700 autopilot would imply. Vectors onto the Localizer were a breeze, and I elected to hand fly most of the ILS 14R approach. With two prior practices under my belt, I found the control inputs required during gear and flaps extension to be predictable and speed was easily controlled (with a little help from Peter regarding the ideal target power settings). This time my flare was more on-point and that, combined with the trailing link landing gear, resulted in a satisfying "chirp" at touchdown.

Training and Future

Epic has developed a top-notch in-house training program that aims to help owner-pilots do much more than simply satisfy FAA and insurance requirements. Their goal is for pilots to achieve "Demonstration of Mastery" of each training program Task. While a turboprop aircraft weighing less than 12,500 lbs does not require a Type Rating, Epic's objective is to help each pilot achieve the same levels of knowledge and airmanship that a Type Rating would require. This is achieved through a program they refer to as "The Epic Challenge." The course includes online study, remote meetings with the ground instructor(s), in-aircraft training, and the use of their incredibly detailed and realistic Frasca E1000 AATD Simulator (located at the Epic Factory Training Center in Bend, OR). While the owner has to pony up for fuel used in their aircraft, all other program costs are covered by Epic.

What the future holds for the E1000 GX is ripe for speculation and, like any similar manufacturing company, Epic is tight-lipped about it. However, there are a couple of blank spaces on the GX panel that might suggest enhanced capabilities to come. With multiple other aircraft in the same category already offering autothrottle and safe-return "emergency autoland" capabilities, one can easily imagine such features being added to Epic's flagship in coming years. One also wonders what experiential knowledge is being gained as E1000 GX fleet hours rise, which could be applied to future refinements. Obviously, maintainability almost always improves as designs mature. Speed and efficiency routinely do, as well. Could a future Epic model or variant be the first in this category to achieve a 350 KTAS top speed? Having already cleared all the hurdles that take most startup aircraft manufacturers down, and with only 17 more knots to get there, I wouldn't bet against Epic. T&T

Matthew McDaniel *is a Master & Gold Seal CFII, ATP, MEI, AGI, & IGI and Platinum CSIP. In 31 years of flying, he has logged over 20,000 hours total and over 5,700 hours of instruction-given. As owner of Progressive Aviation Services, LLC (www.progaviation.com), he has specialized in Technically Advanced Aircraft and Glass Cockpit instruction since 2001. Currently, Matthew is also a Boeing 737-series Captain for an international airline, holds eight turbine aircraft type ratings, and has flown over 115 aircraft types. He can be reached at* **matt@progaviation.com** *or 414-339-4990.*

Skytech, Inc.

by **Lance Phillips**

Back in January of 2001, the Baltimore Sun did a story about how qualified maintenance technicians in the aviation industry were becoming harder and harder to come by. The story referenced business leaders in the area who were actively doing things to help remedy the situation. One of those leaders was Frank Stephenson, the founder of Skytech Inc., based at the time at Martin State Airport in Maryland. Obviously, the world changed dramatically just eight short months later. Still, the needs of the sector supporting business and personal aircraft operations in the United States don't really change too much over time. We still are short on experienced technicians and pilots. What hasn't changed is Skytech's dedication to its customers and adherence to the concept of meeting and overcoming challenges in order to be successful.

Skytech is an authorized dealer and service center for Piper and Pilatus aircraft.

Frank Stephenson was a pilot and Air Force veteran who managed operations at the Glen L. Martin plant in Middle River, Maryland, prior to founding Skytech. He was quoted in the Baltimore Sun article saying, "The problem is national in scope and reaches into every corner of the aviation industry. We attend meetings around the country, and everybody's talking about the same thing: not enough mechanics. The volume of

business is up across the industry, but manufacturers and subcontractors can't keep up with the volume of business." That was 21 years ago. Not much has changed.

Solving problems, though, was Stephenson's specialty. In the 1950s, he made a name for himself by being the only available in the area who could effectively manage Gulfstream's computerized maintenance management system for its G-1 turboprop executive transport. The Martin company's chief pilot brought him onboard specifically for that purpose since Stephenson had the necessary expertise following his days in the Air Force. What they didn't tell Frank was that Martin's other corporate aircraft were converted experimental flight test platforms for Martin's 202 and 404 airliner programs. Without standard airworthiness certificates for these aircraft, Stephenson had to create maintenance plans and found that he had to beg, borrow or steal parts from the factory when needed. This type of innovative mentality went into the creation of Skytech, Inc.

It was in 1976 that Frank Stephenson officially opened the doors of Skytech located in the tower building at Martin State Airport, initially supporting parts development and manufacturing in an old hangar that once supported the B-26 production line. That same hangar then became a maintenance hub for the company, and they were designated an FAA-certified repair station the following year in 1977.

The 1980s were once again a time of change and progression for Skytech. The company saw a need for aircraft sales in the region and hired the man to lead them into a new era. John Foster, who had gained experience working in every facet of the business, took over as president. At this time, Skytech expanded from its role in Cessna single-engine sales to include the entire lineup from Piper, including its newest PA-46 Malibu in 1984.

The next decade was no less exciting. In 1992, Skytech expanded its Cessna sales to include the Caravan turboprop single. The following year it was awarded a distributorship for the world-renowned Pilatus PC-12 turboprop, a relationship that has proven successful to this day.

As the new millennium rolled around, Skytech continued to expand its operations into new areas, this time by opening a new FBO service at Rock Hill, South Carolina (UZA), part of the Charlotte, North Carolina, metro area. The company also started providing maintenance services there.

By the end of the 2000s, more change was in the works as Skytech outgrew the Martin State Airport. They chose to move to the Carroll County Regional Airport (DMW) in the Baltimore-Washington metropolitan area on August 31, 2009.

The new facilities at the Carroll County location include a 5,100 runway with WAAS approaches and a new 22,000 sq. ft. maintenance and FBO facility dedicated solely to Skytech's customers. Skytech also boasts one of the only dedicated aircraft sales showrooms east of the Mississippi River. They still keep an administrative presence at Martin State, but Carroll County is now their Baltimore-area home from a customer perspective.

The launch of the Pilatus PC-24 "super versatile jet" took place at the European Business Aviation Conference and Exposition (EBACE) in Geneva, Switzerland, in 2013, and Skytech was appointed a dealer for this exciting new product. "We always wondered what Pilatus could possibly build next after setting the bar so high [with the PC-12]. And now we know an airplane that does the same things with an even larger cabin, longer range, and more payload while displaying unheard-of short-field performance. And it retains that flat floor and massive cargo door. So here comes the PC-24 – and all the expectations associated with a jet aircraft built with Swiss precision at an airport surrounded by the Alps. This is going to be good," said John Foster. Pilatus PC-24 deliveries started in 2018. Skytech officially became an

Skytech offers “Tip to Tail” service and support with two FAA-certified repair stations.

FAA Part 135 charter operator and the first organization with a Piper M600/SLS in its charter fleet.

Skytech, celebrating its 45th year in business in 2021, announced several executive leadership changes. John Foster stepped into the position of chairman and CEO after leading the daily operations for 22 years. Under John’s care, the company increased its sales footprint and offerings, added two FBOs (Charlotte and Baltimore Metro areas), and entered the world of aircraft management and charter.

Justin Lazzeri, a nearly 20-year Skytech veteran and former vice president of aircraft operations, assumed the role of president. Lazzeri holds a commercial pilot certificate with multi-engine and instrument ratings, as well as a certified flight instructor certificate. He earned his bachelor of science degree from Embry Riddle in Daytona Beach, Florida. Starting as a part-time company pilot, he

The company's full-service FBO at the Carroll County Regional Airport (KDMW).

eventually moved into a full-time position as Skytech's director of marketing – a role he continued to fill for over 16 years. He was integral in the successful development of Skytech's aircraft charter and management departments, which included adding the East Coast's first Part 135 Pilatus PC-24.

One short year later, in 2022, Pilatus Aircraft, Ltd. acquired Skytech, Inc. after a nearly 30-year span of operating as Pilatus' oldest tenured authorized dealer and service center. Skytech also retains its continued association as a Piper authorized dealer and service center. Justin Lazzeri, now a true industry veteran and proven innovative leader, takes over as CEO of Skytech, Inc.

This little company started 46 years ago to fill a need in parts manufacturing and has become a world-recognized leader in sales, service and support in general aviation. They have taken problem-solving to an incredible level, and we can only imagine where Justin Lazzeri and the team will take it in the future. T&T

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

by **Kevin R. Dingman**

Hold Your Horses

Air traffic control holding patterns: Coming soon to an airport near you.

In the 1980s, USAF UPT (Undergraduate Pilot Training) was old-school: manual systems, old avionics and an all-in-one HSI/RMI. The entry position at my airline was as a Flight Engineer on the B-727. And in those days, new-hire hazing, I mean training, was administered by old-school, two-stripe flight engineers in a sim and aircraft with exclusively antique systems and avionics. We lovingly called them "steam gauges." That's the terminology we boomers used before millennials and Gen-Z started calling them "round-dial."

While the teaching etiquette of the MD-80 instructors a few years later was kinder and gentler, the focus remained on antique systems and avionics. My Duke's avionics are similar to the original Mad Dog (all steam gauges except the GPS and transponder). The 737, especially the MAX, and the Citation 650's (III, VI and VII) I now fly, are more modern. The need for an understanding or an appreciation of antique navigational instruments is fading. But it's not gone. We were recently given old-school holding instructions from ATC, and the aforesaid old-school knowledge proved useful.

Lions and Tigers and Bears – Oh My!

– Wizard of Oz, 1939

"Citation 7VS I have holding instructions; advise when ready to copy." The holding clearance was old-school: "Hold east on the RDU 095 degree radial, 35-mile fix, left turns, 10-mile legs, maintain six thousand, EFC 2140." The approach controller had used his picture of the weather and our location to build a holding pattern outside the rain showers – he was doing us a favor. But the clearance to make this happen was straight out of a simulator exercise, as confirmed by the immediate simulator-like knot in my stomach. Almost exclusively nowadays, holding is issued to a published fix that has a published holding pattern:

"Cleared direct OCRAP, hold as published, maintain one-six thousand, EFC 2140." If not to a fix with a published pattern, then to a published fix with follow-on instructions delineating the desired pattern/parameters at the fix. Very seldom is the pattern defined using an antique and inaccurate reference such as a VOR and radial/DME, NDB or Grandma Leyba's woodshed. But when it is, we need to know how to enter and fly the pattern. Sometimes we need to figure it out quickly due to a short-notice event at our destination with the resulting short-notice hold.

Microburst: A Show-Stopper

Snow plowing, extreme weather and incidents such as a blown tire or a VIP event are the most common reasons for a short-notice runway or airport closure. But I've also encountered unusual reasons like earthquakes, forest fires and social unrest. And I once held for a U.S. President getting a haircut on the ramp aboard Air Force One. Closures due to moderate to extreme weather are common and happen every day. ATC knows we don't like to hold (and are sometimes not very precise about it). It's more work for them to construct multiple patterns, so they normally issue speed assignments and radar vectors in order to avoid holding.

That failing, a published holding pattern is their next choice. But inevitably, a few aircraft may need to hold off the grid or "unpublished." During our arrival into RDU, a thunderstorm overhead had closed the field. The rain shower and resultant low visibility were not necessarily a show-stopper, but the announcement of microbursts was. At the captain's discretion (that's you), wind shear is a "proceed with caution" event if the report is not referenced to the landing runway. However, a microburst alert at any location on the field requires an immediate go-around, diversion to an alternate or a hold. Grit your teeth; here are the holding pattern memory items.

> The true art of memory is the art of attention.
>
> – Samuel Johnson

We have to memorize four components to get the holding pattern right: entry procedures, direction of turns in the hold, speed and leg length. In the U.S., the maximum speeds (you can fly slower if you want) are 200 KTS below 6,000, 230 KTS from 6,001 to 14,000 and 265 KTS from 14,001 and up. Timing is one minute inbound below 14,000 and 1.5 minutes inbound above 14,000. If not issued a holding leg-length in distance, they expect you to use time. I will always ask for a distance instead of time because it's easier. And because holding isn't confusing enough already, ICAO and military holding speeds are different from each other and from the U.S. So, look them up before you leave the country or climb into your fighter and then put a sticky note with the speeds on your forehead (ICAO= SFC to 14k=230, 14k to 20k=240 and 20k to 34k=265 and desired Mach above 34k).

The big thing that will help with holding is to remember there is a "protected" side, which is on the holding side of the radial, and an "unprotected" side. If you fumble around on the protected side, it's mostly okay. Fumbling around on the unprotected side is bad – write down this number and call ATC bad. And for better or worse, GPS has made ATC less tolerant of any holding pattern excursions. Holding speeds, direction of turns, timing or distance and entry techniques are all designed to keep us in the chunk of airspace that is on the protected side.

The HPC-2 is a good aid for holding entries.


Avionics are required because "X" does not mark the spot.

T-D-P

Figuring out how to enter a holding pattern was my nemesis for many years. There are countless manuals, study guides and instructor techniques that explain how to enter a holding pattern. I've heard most of them and tried to find one that I could remember…and failed miserably. With hopeful optimism and humility, I offer the one that finally made sense and stuck with me: T-D-P (Teardrop-Direct-Parallel). I bought an HPC-2 from ASA (yes, the 25,000-hour pilot needed a visual aid). It's a handheld card

depicting left and right holding patterns with a clear rotating compass card.

Remember the letters T-D-P in that order and that standard turns are to the right and non-standard to the left. For standard, right turn holding, picture an HSI divided in half with the line starting 70 degrees RIGHT of your heading. If your heading is 360, the line starts at 070 and slices over/down to 250. You put the T in the 70-degree wedge, the D below it in the bigger 180-degree wedge, and the P in the remaining small wedge. Now put the holding radial on the HSI and see which wedge it is in. Then, for non-standard LEFT turns, the line dividing the HSI in half starts at 70 degrees LEFT of your heading. Which, if headed 360 is 290, and slices over/down to 110. The T goes in the 70-degree wedge again, the D below it in the bigger 180- degree wedge again, and finally, the P in the remaining small wedge. Put in the holding radial and voilà.

Don't forget to slow down if needed, report entering the hold, and most importantly, start crunching your fuel remaining in minutes so that you know when to divert. Similar to practicing/reciting your airplane's memory items, do the same with holding pattern entries and speeds, and it will be less chilling when you hear, "Standby to copy holding instructions." I know it's painful. I, too, hate holding patterns. But we need to get them right and know when to bail out to the alternate.

> If you don't know where you are going, any road will get you there.
>
> – Lewis Carroll

Loading a holding fix and pattern into the GFMS takes about 15 seconds if the hold is at a published fix, and because of proficiency, it takes about 30 if it's a radial/DME fix holding pattern. If ATC gives you a short notice hold that is very near your position, you may wish you were flying something slower – so slow down as soon as you hear, "Standby to copy holding instructions." Because, when flying your jet at 250 KTS ground, or faster, things will happen fast.

When we were issued holding to the nearby fix by RDU approach, I quickly recognized our time-crunch dilemma and instinctively fell back to the old-school method. I switched my NAV from GPS to VOR, set in the radial and checked the DME. I did a quick fix-to-fix calculation the way they taught us in the Air Force using DME and the VOR bearing pointer on the RMI (Radio Magnetic Indicator). The holding pattern was close: 20 degrees to the right and four miles away – too close to load the FMS. We were at 6,000 feet and 250 KTS, so I pulled the throttles to idle, slowed to about 200 KTS and turned a bit to the right. I pictured the hold on the HSI using T-D-P, and at 35 DME, entered the

hold via a parallel entry and watched the DME increase.

My FO created a GPS waypoint at the radial/DME clearance fix, used that point as the holding fix and built the holding pattern in the FMS. At 45 DME I turned right onto the protected side of the radial and headed back to the radial at a 40-degree intercept. I tracked the radial inbound and at 35 DME turned left into the hold – just the way the picture appeared on the NAV display a couple seconds later. Whew, we got it right. No need to copy a phone number and call ATC. After just two turns in the hold, and after the autopilot failed during the approach, I hand flew the ILS through the rain to a 400/2 landing. Once parked, we looked at each other and chuckled as we had a moment of "holy crap" about the holding pattern and the ILS. It was a challenge – but fun!

> Baseball is 90 percent mental, the other half is physical.
>
> – Yogi Berra

Holding is a part of flying on instruments just as much as an RNAV STAR, SID or an instrument approach, but the frequency of a holding event is low. And lack of frequency causes a lack of proficiency, which can cause a simulator-like knot in the stomach and may precipitate the dreaded "prepare to copy a phone number" radio call if we mess it up. The same proficiency and phone call issue applies to messing up a non-ILS approach: RNAV/GPS, VOR, ADF and LOC BC. In the Part 121 world, we flew an ILS 90 percent of the time. In the Duke and Citation, we also fly an ILS or RNAV/GPS 90 percent of the time – the other half are visual (thanks, Yogi). Historically, I've been issued a holding perhaps three or four times per year (around every 200 hours) and thus am probably not so proficient – especially if referenced to a VOR/radial/DME, an NDB or grandma Leyba's woodshed.

As I've moved from Air Force jets to the 727, the DC-10, MD-80, the 737, and now to the Citation, each has had increasing levels of (mostly) easier-to-use avionics, including easier-to-load holding patterns. And this has decreased my need for the HPC-2 and sticky notes on my forehead, but they're both still in my kit bag. You may want to carry them too if your holding proficiency level is like mine. T&T

Kevin Dingman *has been flying for more than 40 years. He's an ATP typed in the B737, DC9 and CE-650 with 25,000 hours in his logbook. A retired Air Force major, he flew the F-16 and later performed as an USAF Civil Air Patrol Liaison Officer. He flies volunteer missions for the Christian organization Wings of Mercy, is retired from a major airline, flies the Cessna Citation for RAI Jets, and owns and operates a Beechcraft Duke.Contact Kevin at* **dinger10d@gmail.com**.

An Enid Family Tradition

Peter Dillingham's father, Dan, and grandfather, Tom, with their 1947 Beechcraft Bonanza 35.

Peter and Annie Dillingham with their three daughters and previously owned 1997 Beechcraft Bonanza A36.

The Dillingham family of Enid, Oklahoma, has a long heritage in aviation. Peter Dillingham, a pilot for more than 40 years, is one member of three generations of flyers.

The familial knowledge of combining business and aviation was first pioneered by his grandfather, Tom Dillingham. As a rancher and insurance salesman in Enid, Tom had a local connection to Walter Beech, who was a car salesman there at the time. Both ultimately were enthralled with flying and Dillingham later purchased his first Beechcraft in 1947, a Model 35 Bonanza.

The aircraft purchase ultimately developed into another tradition outside of entrepreneurship – Bonanza ownership. Model serial

numbers have long been points of fond memory as flights and bygone days at the Beechcraft factory are typical conversation among the Dillingham's.

The appreciation for aviation and the legacy aircraft manufacturer is shared by Peter and his two brothers, Jed and Chad, who long owned a Beechcraft Bonanza A36. Peter flew the 1997 model for eight years.

"I only have great things to say about the Bonanza. While it is considered a complex aircraft due to a retractable gear, its systems are very straightforward and it has excellent speed. The A36 is an ideal plane for pilots with greater than 100 hours."

As Dillingham explained, the aircraft was useful in the various business ventures he has spearheaded over the years – predominantly within the petroleum and the food manufacturing industries. He currently serves as the Chairman of the Board of Directors for No Man's Land Foods, an Oklahoma-based beef jerky manufacturer with distribution across the country.

"I have been able to involve flying with all these businesses. Being able to fly myself to meet with customers or vendors, look at equipment, and then get home the same day. This has been made possible living in a city that does not provide commercial air services."

Not only does he fly for business in a continually expanding area, Dillingham often flies with family and friends in his free time. As he explained, "Flying with my wife, Annie, and our three daughters is what I love most."

A common destination for the family is San Antonio. But the 400-nautical mile mission highlighted one shortcoming of the aircraft. "When our daughters were small, we could load everybody and everything up in the Bonanza. But once they were young adults, we would need to preship our clothes to the hotel we were traveling to, then ship the box home after the trip."

As a result of this issue and other payload-limited missions, Dillingham identified the need to increase his range without sacrificing weight. He sought something that could fly further and faster than the single-engine, high-performance piston while comfortably carrying the same number of passengers he had become accustomed.

"I was looking for a Piper Meridian, and if you had asked me, I would not have said a TBM was in the running. But I learned that TBMs have a lot more range than Meridians; roughly 1,300 nautical miles in a TBM 700C2 versus 800 nautical miles in a Meridian, for example. The TBM also has a 20 to 30 knot per hour speed advantage. So, on long trips, many times you can go

Peter transitioned to turbine ownership with a 2003 TBM 700C2.

nonstop in the TBM versus making a stop in the Meridian".

Flying at 28,000 feet, Dillingham advised the TBM achieves speeds of 280 knots per hour (assuming no wind) while burning 55 gallons per hour.

Now nearly a year and a half into TBM 700C2 ownership, he offered many complimentary things about his 2003 build. "The TBM has allowed us to expand the range of our trips from more of a regional basis to nationwide. The same time it would take to fly to Cincinnati in the Bonanza, we can make it to Bar Harbor."

Additionally, Dillingham spoke about the transition into flying the TBM after many years in a Bonanza. "I was lucky when I began training in the TBM in that Joe Casey (with Casey Aviation) was able to locate a plane that had almost the identical Garmin avionics that we had installed in our Bonanza, so I didn't have to learn a new panel. I had no prior exposure to a turbine engine or a pressurized airplane, so I was initially intimidated. Once I got into it with Joe, I quickly learned that while you must respect the differences, there are a lot of

advantages to what I was moving into. I felt comfortable flying the TBM solo when we finished the 25-hour course."

The TBM has helped with the hockey stick growth that No Man's Land Foods has experienced since Dillingham and two partners became involved with the beef jerky manufacturer in 2015. Much of the growth can be attributed to how the company conducts business. They ensure commitments are always backed and personal connections are continually fostered. Dillingham's newest aircraft has allowed them to successfully follow this model of trust-based operations, often leaning on the TBM's range at a moment's notice.

"We had an instance this year when two members of our sales team needed to be in Pennsylvania for a customer meeting one afternoon and in Grand Rapids early the next morning for a presentation to another. We left Enid that morning, made the first meeting, and I dropped them off in Michigan before dinner," Dillingham said.

The increased performance attributes of the TBM have been advantageous for Dillingham's business and personal interests. As a Bonanza owner, he would fly about 80 to 100 hours a year, but last year he flew about 235 hours in his new aircraft.

"I was able to utilize our Bonanza in addition to commercial flights when I needed to travel for business and pleasure. With the TBM, I've been able to comfortably complete most of our travel needs in lieu of commercial flights. The combination of range, speed and payload for the business pilot is hard to beat. Plus, being able to bypass the hassles you encounter at commercial airlines is a great convenience."

A sampling of No Man's Land Foods' products.

Dillingham said that his aircraft fits his mission exceptionally well and doesn't know where he would go from here as far as a bigger aircraft. Grateful for being born into a family of aviators, he said, "I have never climbed into the TBM or my Bonanzas without a great big dose of appreciation for being able to fly." T&T

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Written **By** Pilots **For** Pilots

The High Cost of Insurance

Fatal accidents in twin and turbine aircraft are tragic and costly. And although infrequent, they grab our attention on the nightly news. But far more frequent and financially significant are non-fatal incidents. My unofficial analysis indicates that multiple times each month, a twin or turbine aircraft is substantially damaged before it even gets into the air. For the purposes of this rambling, I have divided the causes into three categories:

Bad Drivers

Probably the biggest piece of the puzzle, bad drivers come in all shapes and sizes.

- The unlit tug operator towing a Citation at Midway airport at night colliding with a pickup truck.
- The startled Chevy Suburban driver impaling the wingtip of a Falcon 50 through his windshield.
- The distracted TBM pilot rear-ending a King Air on a taxiway.
- The driverless Tesla being summoned by its owner, plowing into a Cirrus Vision Jet.

The list could go on for quite a while. As pilots, we don't seem to be much better on the runway than the freeway. But the financial cost of repairing an aircraft is astronomical. A "dent" in a Citation Mustang wing can exceed $1 million in repair costs, often totaling the aircraft. And while we often get away with distractions while driving our car, a few seconds of inattention on the taxiway can wreak havoc with our checkbook and insurability.

Stupid Pilot Tricks

We are often in a hurry to get to point B.

- The jet blast from a Global Express powering up on the ramp seriously injuring a passenger walking behind the airplane.
- Attempting to take off with the parking brake partially engaged.
- Leaving the cockpit with both engines running and finding your jet running loose on the service center ramp.
- A rushed preflight leaving several loose engine fasteners unnoticed until the cowling departs the aircraft and strikes the tail of the jet during flight.

We need to slow down. Think two steps ahead of the situation. Ask ourselves, "What could go wrong?" As you watch entertaining pilot videos on the internet, think about how you could make your next flight safer.

Weather and Birds

The least controllable aspect of flying as both are "where we find them."

- Freak tornadoes, like the one in Nashville, Tennessee, destroying the entire contents of a single hangar.
- A Pelican colliding with a Premier jet wing, totaling the airplane.
- A record-breaking snowstorm in the northeast collapsing the roof of a hangar full of biz-jets.

Consider delaying your takeoff for a few seconds when the tower reports birds on the runway. Choose the sturdier hangar on the airport if you have a choice. We are all paying for the costs of our behavior. We need to be more aware and help each other out.

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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- *Jeff McClean, Vice President Global Flight Operations, Procter & Gamble*

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