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APRIL 2022 $3.95 US
VOLUME 26 NUMBER 4

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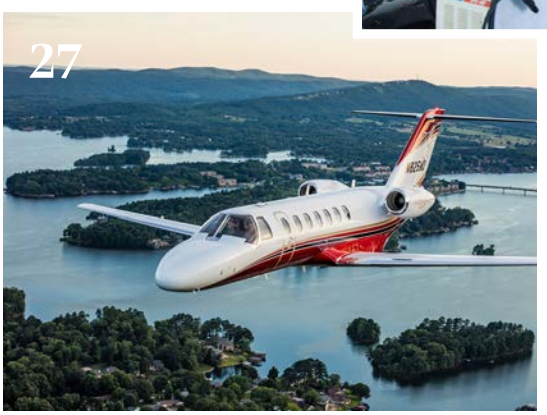

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The Turbine Transition

The following editorial is guest written by Jared Jacobs.

There are numerous paths pilots can take when making the piston to turbine transition. The more gradual approach is to start with a single-engine turboprop, move to a multi-engine turboprop, then graduate to a multi-engine jet. But in today's market, there are also plenty of options that allow pilots to jump from a piston straight into a single or multi-engine light jet.

Whichever path you choose, there are many changes and differences to consider in operation and ownership of the airplane. This T&T issue contains insights to help inform and educate on some of those considerations. Here are a few tips from my personal experience climbing the piston to turbine ladder to kick things off!

Prioritize Your Training

While I'm not saying you need to pay for the most expensive training option (or that price is even an indicator of the quality), do your research. Find the training most compatible with your past experience and your new aircraft. Simulator-based training is known to be the industry standard because it can introduce weather, system failures, and other dangerous situations in a controlled environment. But in-aircraft training can provide real-life, tangible experience in your own aircraft that a simulator just cannot replicate. A combination of simulator training and in-aircraft could be an effective option. Find a few different options, compare their pros and cons, and make an informed decision that is right for you.

A second point is don't skimp on how much of your time and effort you give. In these training events, you truly get out of it what you are willing to put in. To get the most out of your investment and build your skill set, you need to properly prepare ahead of time by going over any pre-course study material. Once in training, pay attention closely and participate in the ground school, asking any questions you may have and completing homework assignments. Life is sure to try and distract and pull you away, but for the period of time you are in training, look at it as your new full-time job. It deserves complete and uninterrupted attention.

Find a Mentor

Some insurance companies will require a certain number of hours flown with a mentor pilot in your new aircraft. At first, that may seem restrictive, but it is a great way to become familiar and comfortable in the aircraft. I would recommend this practice to anyone moving into a turbine for the first time or pilots transitioning to a different turbine.

Having an experienced set of eyes follow along on a pre-flight will help you understand what is normal and what you should possibly be on the lookout for. You'll also receive guidance on items such as running checklists or flows, handling tricky clearances in the new avionics, and how to best configure and fly different approaches. Taking a mentor along on the first few flights will allow you to solidify what you've learned in training while picking up some rules of thumb and gaining valuable real-world experience on routes you commonly fly.

Take it Slow

Again, I have a couple of points here. The first is that a turbine aircraft has expanded capabilities from what you may have been accustomed to with previous aircraft. But just because the aircraft is capable doesn't mean we should immediately explore and test all of those capabilities at once. Layer new experiences and pressures on slowly so you don't wind up overwhelmed. For example, if you've never experienced meaningful icing before, don't let the first time flying in moderate or greater icing be in an area of low IFR. Similarly, if you haven't flown into a mountainous airport in the aircraft, select a nice VFR day if you are going to do so.

Said another way: Know your limitations and recognize that these limitations may have changed drastically from

your last aircraft. With experience (and input from a mentor pilot), these limitations can be reevaluated, and you can quickly start expanding into the new capabilities of the aircraft in no time.

The second part of this tip is quite literal. If you feel rushed or behind the airplane at any time, slow it down! A common misconception I suffered from early in my turbine transition was thinking that I had to be flying fast because I was flying a turbine-powered aircraft. Yet, most common first turbine aircraft you will encounter have very wide airspeed envelopes and can fly fantastically at airspeeds similar to a high-performance piston aircraft. When things start happening too quickly, slow the airplane down to a speed you are more accustomed to.

This is clearly a condensed list, but I believe it's a good place to start with more content on the pages to follow. One last tip that I hope goes without saying is to have fun! Flying a turbine aircraft will be a fun challenge that will ultimately make you a better pilot. And the experiences you gain and the places it will take you are bound to lead to many enjoyable memories. T&T

Jared T. Jacobs *is an ATP-rated turbine pilot, instructor and mentor. He currently flies corporate aircraft both single-pilot and as crew for a Fortune 500 company. Jared can be reached at* **jaredjacobs2@gmail.com**.

Things I Will Not Do in Multi-Engine Training

by **Thomas P. Turner**

As I tell my multi-engine students, instructors cannot safely or accurately simulate an engine failure close to the ground in an airplane. That's what simulators are for. I highly recommend multi-engine pilots seek out simulator-based training when they first transition to twin-engine types, then alternate between in-airplane and simulator-based training for recurrent and refresher training thereafter.

Instructors can, however, provide a somewhat gentler transition to single-engine operation, either fully feathering the propeller or into the "zero thrust" condition. Once in actual or simulated single-engine flight, we can accurately present single-engine operation, handling and performance, allowing the multi-engine pilot to experience the process from engine securing to single-engine landing. In other words, we can't give you the full sensation of engine failure, but we can let you experience the process of flying the airplane to a single-engine landing, which NTSB history shows results in at least as many accidents in twin engine airplanes as failing to maintain control through the engine failure itself.

This all brings up the topic of how instructors may safely present the unique skills of flying a multi-engine airplane – the things we do, and in this context, more importantly, the things we will not do in a twin in actual flight. Typical safety protocols have changed over the years to reflect experience and trends in multi-engine instruction. Some of the inherent limitations of safe in-airplane instruction are now offset with the growing availability of Flight Training Devices (FTDs) and other simulators and regulators' acceptance of these devices toward flight experience requirements.

As a pilot receiving instruction in a twin you discuss training safety protocols with your instructor before you fly. Unless you're new to twins very often you will act as pilot-in-command and be legally responsible for the conduct and outcome of the flight. More importantly, safety during flight instruction is a team effort; you and the instructor work together to ensure learning occurs while risks are managed.

Obviously, the major difference between training in a single and instruction in a twin is the presentation of engine failures. Whereas in a single-engine airplane the options are naturally quite limited (and obvious), engine failures in a twin require different responses and decisions in different phases of flight. In some of the phases of flight – most notably takeoff – the risk of providing the training in the airplane outweighs the benefit. For that reason, many instructors impose limitations on their operations and instructors. Here's what I (and many multi-engine instructors) will and will not do:

1. **Minimum runway length: 4,000 feet.** For accelerate/stop distance and in the event of a planned engine failure simulation on the runway, a minimum 4,000-foot runway works in most piston twins. The required runway may be longer at higher density altitudes.
2. **Minimum runway width for simulating engine failure on the ground: 100 feet.** Directional control is the skill to teach and learn if an engine fails during the takeoff roll. To provide a margin for under- or over-correcting, I require a runway at least 100 feet wide for a simulated engine failure on the runway.
3. **Maximum speed for simulating engine failure on the ground: 40 knots.** FAA guidance for instructors and examiners is that simulated engine failure on the ground should not be initiated at speeds more than 50 percent of the published VMCA speed for that aircraft. Apparently, the reduced inertia and therefore stopping distance at lower speeds offsets the lessened control authority at those speeds. Most piston twin VMCAs are around 80 knots, making 40 knots a good all-types limitation. Further, most original (analog) airspeed indicators become effective at 40 knots.

This made an easy crosscheck for instructors: If there is any indicated airspeed at all, you're too fast to simulate an engine failure.

Note that VMCA (red radial) speed is a worst-case scenario for engine failure in the air (the subscript "A"). There is also a VMCG (for "ground") that takes into account nosewheel steering and the nose tire's resistance to turning. However, in the absence of a published VMCG in most piston twins, VMCA is usually the only guidance we have.

4. **Minimum altitude for simulated engine failure after takeoff: 500 AGL/above field elevation.** The rate of departure from desired flight path on all three axes (pitch, roll and yaw) is very great in a twin at low altitude. The operating engine is generating more thrust, so the effects of asymmetric thrust are greater. Even in turbocharged airplanes, there is less thrust at higher altitudes because of reduced propeller efficiency. What you see practicing engine failures at the FAA-suggested 5,000 feet AGL minimum altitude is much less dynamic than what you'd experience in a real-world engine failure on takeoff because at altitude the "good" engine is putting out much less power.

   Meanwhile, there is more drag on the "dead" side's windmilling propeller in thicker, low-altitude air. If the gear is down the loss of airspeed is so great that you don't even have time to retract the gear before it becomes critical – hence push the nose down, chop both throttles to idle to remove thrust asymmetry, and hold heading with rudder while you land straight ahead. If the gear is up you may be able to push and hold to remain at VYSE ("blue line") while you address the engine failure and, if appropriate, feather the correct propeller. But you may climb very little or even lose some altitude while you do so.

   That's why I do not initiate a simulated engine failure within 500 feet of the ground – to give you room for a possible loss of altitude during your response.

5. **Single-engine go around minimum altitude: 500 AGL/above field elevation.** Experience shows that it takes roughly 400 feet to turn a single-engine final approach descent into a single-engine go-around climb in many piston twins. As you apply full power on the operating engine and adjust controls for the change in asymmetric thrust, re-trim the airplane and retract the landing gear and flaps. The airplane will continue to descend before it slowly begins to climb at the very low rate of a piston twin on one engine. This is an exception to the rule "positive rate, gear up." Most pistons and even some turboprops will rarely be able to climb at all on one engine with the gear extended. You need to retract the gear before seeing a positive rate of climb because you'll never see it if you don't retract the gear.

   This brings up another decision point: When landing on one engine (in a real-world engine failure), you are committed to land when either (1) you select full flaps (because of the substantially added drag and long retraction time) or (2) you descend below 500 AGL. If either (1) or (2) occurs, you may have to side-step and land on a taxiway or in the grass if something blocks the runway. But you have a very low chance of success if you attempt a single-engine go around.

   Personally, I use 800 AGL as a minimum single-engine go around altitude to provide a little margin. Unless the go around is done specifically for training (i.e., we're simulating a single-engine landing and someone taxis onto the runway ahead of us, or we'll land long or short, or we aren't holding centerline without sideways drift), I'll follow a prebriefed procedure with the student where we restore climb power to both engines and control the airplane into a two-engine climb.

6. **No landing with a propeller feathered except in an actual emergency.** There was a time when many multi-engine instructors would have the student feather a prop and then land. It's a great confidence builder and many members enjoyed the experience. But there are no margins for error. And restarting a feathered propeller on the ground is difficult and stressful on the engine (that's why the props have anti-feather lock pins for normal shutdown). So most multi-engine instructors limit themselves against actual one-engine landings – a personal minimum I fully support.

   I do, however, have the student land with an engine in zero thrust. This allows the pilot to experience the "rudder reversal" when reducing the operating engine to idle for landing. The rudder trim, set to counter the effects of asymmetric thrust, now yaws the airplane in the opposite direction. It also demonstrates the "float" and substantially longer landing distance on one engine, so much so I've always personally required at least 5,000 feet of pavement for a zero-thrust landing. This maneuver requires good pre-briefing and coordination between the instructor and student because to be effective the

pilot must leave the "dead" engine in zero thrust and not reduce its throttle before touchdown (simulating the reduction in drag from a feathered prop). To be safe, the two must work as a crew to advance power on both engines in the event of that previously described real-world go around.

I follow these personal minimums on presenting engine failures to protect you and your airplane. Multi-engine instruction is a very risky business, and I for one have a well-developed sense of self-preservation in addition to my concern for you and your airplane. As a pilot receiving instruction in your twin, I suggest you speak with your instructor to set similar boundaries before you fly.

If you want to practice more realistic engine failures during the takeoff roll and immediately after takeoff, that's what simulators are for. In fact, if you have a favorite Flight Training Device-based or simulator-based training facility, let me know its name, location and contact information at *mastery.flight.training@cox.net*. T&T

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

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PISTON TO TURBINE

WHEN IS IT THE RIGHT MOVE?

Part I

by **Joe Casey**

There's definitely an allure to a turbine. Do they exude status? Are they really safer and smoother? Is the performance that much better? Or is it just another hill to conquer?

I'm a flight instructor in the PA46 world, and I get to talk to a lot of people who are ready to make their dream of burning jet fuel a reality. I love the PA46 market for many reasons, the biggest being the type of person who ends up gravitating to this special niche of aviation. It attracts those who would rather fly themselves and who also demand the best in avionics, performance and style. About 50 percent of the airplanes in the PA46 market are piston versions and 50 percent are turbine versions. So, I help a lot of people make the move from piston to turbine and hear all the reasons why they make the move. I also provide initial training to many turbine wannabes and often see what makes the move from piston to turbine a huge success or a dismal failure.

Piper M350

Piper M500

Why a Turbine?

Well, the answer is different for many people, but it usually emanates from a negative piston event. To realistically consider a turbine upgrade, you've got to have solid experience in the piston world. Most prospective pilots don't even think about turbine aspirations until they have at least 500 hours in the logbook, and most have more than a thousand. I've seen some pilots move to a turbine in less than 500 hours, but in today's extremely tight insurance market, most can't make the move with such few hours and still be insured.

One of the really negative aspects of the PA46 market is that there are plenty of people who have more money than aviation experience. Simply put, they can buy more airplane than they can responsibly operate. Experience is important. Some prove it every year by causing a nose gear collapse on a turbine takeoff, crashing the airplane on landing by using beta/reverse improperly, or by just "being behind the airplane."

So, most of the time, a turbine wannabe is going to have filled up the first logbook. And, with a filled logbook usually comes a harrowing piston story. Most newbies in aviation have an "it can't happen to me" attitude when it comes to engine troubles. But, anyone with a filled logbook will probably have an inflight story about a valve spring breaking, a turbocharger blow up in flight, a seriously high EGT that scares them, or a complete engine failure. With that experience comes a freshly matured aviation perspective that is far more conducive to one day becoming an old pilot.

As for those big turbocharged pistons, are they as reliable as the moderately sized normally aspirated piston engines? I've got an IO-470 in my 1961 Bonanza, and I can operate that sweet engine very cool, very smooth, and once I go above 4,000 ft MSL, the engine is now running with less and less internal pressures. A Lycoming TSIO-540 in a Piper Mirage is working hard most of its life because it has turbochargers. During the climb, cruise, and even sometimes in descent, that engine is producing manifold pressures that are above 29.92 inches. I think less is asked of the normally aspirated engine, but turbine wannabes usually migrate from an airplane with a big turbocharged Continental or Lycoming engine starting with a "5," meaning engines where *a lot* is being asked of them in flight. Anything with "TSIO" as the first letters of the engine data plate are really engines designed to create about 250 normally aspirated horsepower, but they then bolt on all sorts of devices to allow them to create much more horsepower. With big piston engines, more is asked, and asking more demands a more adept aviation management touch.

So, that pilot with two logbooks ends up with a vibration in the engine, an engine hiccup, or starts logging unwanted glider time, and they survive to tell the story. Then, I get a phone call. So has started the turbine dreams of many a pilot.

And let's not forget about spouses. While many pilots believe they are the head of their household, the spouses are sometimes the neck, turning the head in whatever direction desired. The spouses don't like any engine noises other than a hum. Did your engine hiccup? Just ask your spouse; they are aware. They are like a wonderful watchdog that will let you know when anything weird is approaching. They may not be able to tell you what the amber or red light means, but they know when that light normally comes on and normally doesn't. So, when that noise occurs or the light comes on, the spouse is sometimes the one to say, "I think I'm okay with that turbine upgrade. It is safer, right?" Many a pilot has those turbine dreams answered because the spouse got onboard with the turbine plan.

How Important is a Good Engine?

You already know the answer: It is everything! Every single-engine pilot should be familiar with the mantra, "Put all your eggs into one basket and watch that basket." Engine health is critical. But so is the type of engine.

To explain this better, let's take a step backward in time to illustrate a point.

I own a 1940 LP-65 Porterfield. It is a historical tandem trainer airplane built before WWII (which means I love it already. I love old airplanes) that is affectionately called "the skinny bird" because it is so narrow. It is a fine airplane in every sense of the word, except for one thing: It has an engine that is not reliable – a Lycoming O-145. This was Lycoming's first horizontally opposed engine, one they made just after they stopped making sewing machines and automobile engines. It is a true historical engine, and it is not very reliable. There are more of these engines that are now the foundation for an FBO coffee table than are still pulling airplanes through the sky.

The O-145 is rated at 65 HP, but that is a stretch. There's not a VSI in my Porterfield, but I bet the rate of climb is less than 200 fpm with two people on board. With one person, it probably climbs out at a whopping 300 fpm. It is just an atrociously underpowered airplane. If anything happened to the engine on takeoff or climb out that was minor, just something that would reduce the power a little such as loss of a cylinder, a broken valve spring, or carb ice, I seriously doubt the engine would get me back to the runway.

So, although I love the Porterfield, you fly the Porterfield differently than other airplanes. You are super-vigilant about knowing the wind; you listen to the engine carefully while still over the runway; you turn 30 degrees off runway centerline so you have a chance of making "the impossible turn" possible; you stay near the airport until you have enough altitude to return to the airport; and we never take the Porterfield more than 100 nm from my home airport. Simply put, you fly the Porterfield with a different mindset than you fly an airplane with a strong and reliable engine.

This is the same inverse shift in mindset that you gain when moving from a piston to a turbine. The turbine relaxes the mind from troubles related to loss of power, either a complete loss of power or a reduction in power. If you frequently fly over mountains, fly at night, fly low IFR, fly over water, or fly any other scenario where an engine failure could spell death or destruction, then the turbine has tremendous appeal. If I fly a North Atlantic crossing in a piston, I've got the immersion suit on up to my waist and I'm vigilantly scanning for trouble. If I'm in a turbine, I'm far less concerned. The shift in mindset is what many turbine wannabes want, and I don't blame them.

Is the Turbine Really Better?

Yes! If I can afford to sit behind a PT6, I'm sitting behind a PT6. In every way that matters, the PT6 is a better engine. Strong statement? Yes. But, search the heart and mind of anyone that operates both piston and turbine and this truth will come out. If money were no object, you too would sit behind a turbine, assuming fuel availability and performance parameters are equal. If we are being honest, the turbine is better.

I mean, a piston engine is very old technology. The engines of

today are not substantially different than they were 80 years ago. We still use magnetos, still have lead in our fuel, and still have catastrophic engine failures. Yes, there's been some advancements in technology, some major ones. But, not many advancements in engines that develop more than 350 horsepower. So, if you dream of more performance and more reliability and you want to fly your own airplane and go far, you will have turbine dreams.

The horizontally opposed piston engines that dominate the owner-flown cross country market have a gob of parts that move in different directions, they have four separate strokes happening in the same small space every second, and have complex systems that are required to keep the engine developing more horsepower than originally intended. It is a testament to the fabulous engineering of these machines and the broad cadre of wonderful maintenance providers that keep these engines running that we don't have more accidents than we have today. It really is old technology.

The turbine engine? They too are a wonderful technology, but it is much simpler. The turbine has fewer parts and those parts all move in a continuous direction. Things turn in a turbine engine, and things push and pull in a piston engine.

The key to a turbine is that the four stages of developing energy (intake, compression, power, and exhaust) happen in separate areas of the engine. So, the intake does nothing but intake, the compression section does nothing but compress air – you get the point. And the area where combustion occurs, the "hot section," is where the power is generated. Because heat translates into wear with any engine, the hot section of a turbine gets lots of attention at maintenance events. "Nozzle inspections," "borescopes of the hot section," and "hot section inspections" are all new terms that replace "top overhaul," "cylinder replacement," "valve guide wear," and "corrosion on the cam" that happen with a big piston engine. With the turbine conversion comes a whole new vocabulary, a whole new language that must be learned.

Whereas a piston engine in a typical owner-flown cross-country airplane is an engine designed for less horsepower, and then we ask more of that engine to increase the horsepower, most turbine engines in the owner-flown world are engines designed to create far more horsepower than is actually used in the owner flown application. Most turbine engines are "derated," which means the torque is limited to a number that can be managed by the airframe. For example, the PT6-42A found in a Meridian is nearly identical to the engine found in a King Air 200, except that the Meridian is derated to 500HP and the King Air is derated to 750HP. The PT6-42 could develop more than 1,000HP if an airplane were strong enough to "let the horses run free."

So, the PT6-42A in a Meridian is never really challenged at all. At most, it is developing only half the horsepower it could create. There's a lot of margin built into a turbine. That makes me feel good about sitting behind a turbine.

Are Turbine Engines More Reliable?

Yes, with a huge caveat. As I've illustrated, the turbine engine certainly fails less than the piston. But the statistics of the turbine and piston world are not altogether different. Why? I think there are two reasons why: pilot experience and power rollback.

Engine failures in piston engines usually don't cause fatal accidents. Most piston engine failures result in a controlled landing. Now, that doesn't mean that the airplane flies again, but it does mean the pilot lives and gets to go flying again. Engine failures are not the nemesis of fatal accidents. The stall/spin scenario is the fatal scenario that every pilot should know to understand and avoid. An engine failure can certainly lead to a stall/spin accident if the pilot flubs the engine failure, but the engine failure was not the deadly event.

In the PA46 world, I'd like to report that the turbines have a much better fatal accident safety record than the piston versions, but that is not the case. It seems that the turbine pilot causes fatal accidents just as often as the piston pilot. But, it is not because of an engine failure, it is because of the pilot mishandling the airplane and causing a stall/spin accident.

The other event that causes accidents in the turbine world is the power rollback. In a turbine, there is the potential that the power can "roll back" to idle and the engine won't respond to power lever movements. It seems that the turbine engine airplanes certainly have fewer engine failures, but they seem to have a lot of power rollbacks that are mishandled by the pilot.

A single-engine turbine pilot will always have a Manual Override (MOR) switch or lever to control the engine in a power rollback scenario, but it also seems that the MOR is either fumbled or not even used when the rollback occurs. Every turbine pilot, either in a single or multi-engine turbine, should fully understand the power rollback scenario. Embarrassingly for the turbine community and the CFI cadre that train the turbine community, it appears there is a serious lack of understanding of the power rollback.

So, is the turbine more reliable? Yes! But, the turbine pilot had better understand the power rollback because the rollback is a real threat and nullifies the huge reliability advantage of a turbine over a piston.

Stay tuned for Part II in the May issue with more insights and considerations surrounding turbine performance, operation and maintenance. T&T

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Moving On Up
Introduction to Jet Maintenance

by **Elliott Cox**


PHOTOS BY AUTHOR

Let's just get it right out of the way: Jets are more expensive to maintain than piston twins. And they say writing is difficult.

I have a little bit of space left, so let's go over some examples of how people keep their kerosene burning speed machines legal and safe. As with most things in life, many options vary widely in cost and convenience, and there are probably nearly as many arrangements as there are airplanes, so this list is far from comprehensive.

Be Your Own Maintenance Manager

If you have the time and a basic grasp of how the maintenance world works, you can manage your own maintenance. There are thousands of parts, inspections and life-limited components to keep track of and a simple Excel spreadsheet just won't do. Turbine owners live and die by these intervals so you're going to have to invest in a maintenance tracking service like CAMP, FlightDocs, or Traxxall, to name a few. These subscriptions aren't inexpensive, but the service they provide is essential to having a solid grasp on the health and status of your airplane. Most services will provide you with a free trial period so you can work with several of them to see which one suits you best.

The interface with these services couldn't be simpler. You'll input the current hours and landings into the appropriate spaces, and it'll spit out a "due list," which will list the items that are due or will become due within the timeframe you specify. Maintenance tracking services are like crystal balls (without the bead curtain) that can save you plenty of downtime, money, and frustration when you use them properly.

When you have inspections or tasks due in the next several months, you need to have your slot secured with the service center of your choice sooner rather than later.

Service centers are busier now than ever due to many factors – workforce shortages, increases in private air travel, and supply chain problems rank highly among those factors. Earlier this month (February) I scheduled a maintenance visit for the Falcon 900LX that I maintain, and the facility I'm using was booked solid until November. Thankfully my inspections aren't due until December, otherwise I'd be scrambling to work out a Plan B. Many times, a service center can "work you in," but be prepared to be last in line for the available labor pool that the shop has on hand. It's best to use that crystal ball to stay as far ahead of the maintenance schedule as possible.

Another responsibility you will have to sort out as your own maintenance manager is figuring out who will be doing your pre/post-flight inspections, services, and database updates. The simplest solution is for you to do it all yourself, but a few factors may prohibit this. If you have your own hangar, external power cart, and oxygen and nitrogen bottles, this is a no-brainer. Otherwise, you may need to find someone on the field you can trust to check tire pressures, oil and oxygen quantities and keep your navigation and chart databases up to date.

Hand Your Keys to a Service Center

If there's a maintenance facility with which you have a good relationship, you can throw them a spare set of keys and grant them access to your maintenance tracking software with the understanding that they'll let you know when tasks are due. This is probably the most expensive option, but it frees you from putting a lot of time into maintenance tracking and planning. If you're based at the same drome as the service center, you get bonus points because you won't have to ferry an empty airplane every couple of weeks to accomplish minor tasks. Otherwise, you'll be paying travel expenses and labor for the service center to come to you.

The upside of handing over the keys is that you have a group of professional maintainers keeping an eye on your airplane's due items and service schedule. The downside of that is you're going to be paying a premium for most of the tasks they perform. Most shops won't nickel-and-dime you to death for the small stuff if you use them exclusively. Still, you can't expect them to tie up an avionics tech for a half a day to download, transfer, and install databases, download and submit engine data, and reset computer faults for free.

The "hand them your keys" model also limits your options when it comes time to comply with larger inspections. Even if there isn't a written contract, if you've handed your keys to a service center, they're going to assume that you'll use them exclusively. If another service provider offers you a great rate to do the next inspection and you take them up on it, the shop that has your keys will lose out on a decent payday. They've likely provided time and labor "on the house" for a lot of smaller tasks with the understanding that they would be the one to get that big inspection to even things out.

I'm not the biggest fan of using just one service center for all your maintenance, so this is the least desirable

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Engine removal in process.

option for me. I've known several owners who use this model and it's worked out for them, but I certainly don't think it's for everybody.

Hire a Maintenance Manager

This option is somewhere between being your own maintenance manager and handing your keys over to a service center because you're going to hire someone to take care of your airplane for you. You'll still be involved in the maintenance of the airplane, but you won't be shouldering the weight of day-to-day stuff.

The most difficult part of using a maintenance manager is finding the right person. They can be a mechanic that you know, a friend of a friend, or someone who comes to you via a recommendation from another operator. If you don't know of anyone who fits the bill, ask your flying friends or the folks in your type-association or aircraft club for recommendations, and you're likely to get at least a few solid references. Your maintenance manager will play a huge role in your safety, the safety of your passengers, and your money, so mutual trust is key.

Once you find that perfect person to take care of your airplane, the first thing the two of you need to do is to collaborate on a monthly maintenance agreement. You, as the owner, need to clearly convey what you expect to be done daily, weekly, monthly, etc. Your new maintenance manager needs to clearly convey how those things will be accomplished, the fee(s) that will be charged, and their requirements to do the job legally and safely. At the very least, your maintenance manager will need access to technical publications for the airframe and engines, full access to your maintenance tracking software, and the means to order parts and consumables. I'm a proponent of having the agreement in writing so each party can refer to it as necessary; whether you get a lawyer involved is up to you.

A maintenance manager can be whatever you need them to be, and you can be as hands-on or hands-off as you want. Clear communication between the maintenance manager and the owner/operator is key to making this arrangement work. I've heard nightmare stories of airplanes being grounded because each party thought the other was responsible for taking care of certain tasks, and a very big ball got dropped.

Of course, after you and your maintenance manager have worked together for a few months, there may be a certain amount of adjustment required to form a smooth operation. As long as the two of you can work things out agreeably, this can be a long-term and mutually beneficial relationship.

Parts to the nose wheel.

Something Completely Different

I've only scratched the protective plastic coating of the surface of turbine maintenance here. There are many driven and creative people in aviation, so I'm sure there are many ways to keep a jet legal and safe that I haven't run across yet. One big thing that people new to the world of jet maintenance, or aircraft maintenance in general, need to keep in mind is that the most expensive option doesn't necessarily guarantee the best quality care, and vice versa for the lowest cost option.

There is a learning curve when it comes to the difference in maintenance between a single-engine airplane and a twin, and that curve gets considerably steeper when you move up to a jet. No matter which part of the curve you're scaling, the bottom line is that you shouldn't go it alone. That's not to say that you should pour a bucket of cash onto

anyone who says they have the perfect system to take care of your airplane and you won't break so much as a bead of sweat. I'm saying that having a network of friends who have experience in maintaining an airplane like yours is priceless. A type-association is a great place to start if you don't have anyone based at your home airport with the same model airplane as yours.

If you're stepping into a Citation, the "Citation Jet Pilots" association is a pilot-owner group that probably possess more knowledge and resources for the smaller Citation jets than Textron. Cirrus operators have the powerhouse of COPA (Cirrus Owners and Pilot Association) if you're interested in a VisionJet.

No matter which airplane you own or are considering owning, I guarantee that there's an established group of people who own, fly, and maintain that model who will be happy to answer any questions you may have and help you build a network that will help ensure that you have many years of safe fun in your airplane.

Happy wrenching and fly safe. T&T

Elliott Cox *is a pilot and the Director of Maintenance for a Part 91 Corporate Flight Department in the Southeast. You can reach him at his website TheWritingFlyer.com or by email at* **elliott@thewritingflyer.com**.

Central Flying Service

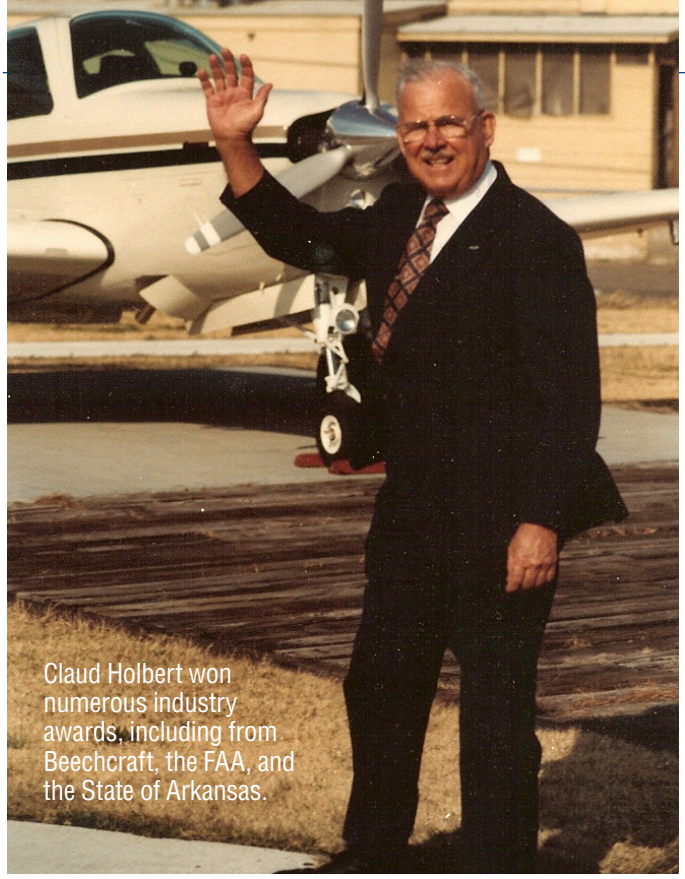
by **Lance Phillips**

If the companies we've been chronicling the last few months have anything in common, it's that they were aviation pioneers in various geographical regions in the United States, and they were born from a vision established shortly after the Wright brothers flew their first heavier than air flight. When the parents of Claud Holbert, themselves from a Tennessee family who'd migrated west to Texas in the 1800s, relocated to the hills of Arkansas, little did they know their son and grandsons would go on to establish Little Rock, Arkansas as a world leader in aviation.

Claud Holbert, born in 1910, didn't wait a day longer than legally necessary to earn his privilege to fly. He joined the Arkansas Air National Guard at 16. His dad had moved the family to Little Rock from Texas a few years earlier to open an auto parts and repair service, and it was there Claud gained a healthy respect for hard work and motoring. Soloing at 17, Claud also began his higher education and was pinned with officer's wings in the 154th Observation Squadron of the AANG. He soon saw and then realized a business opportunity – teaching others to fly.

The world in the late 1930s was eerily similar to what we're experiencing these days. A European aggressor was invading peaceful neighbors, and the U.S. was doing everything it could not to send young people into a foreign conflict. Claud started Central Flying Service in 1939 with a single financed Taylorcraft. He was awarded a contract with the federal government as a civilian pilot training center, or CPT, a program initiated by then-president Franklin Roosevelt to address the growing need for pilots in the United States. After World War I, people in the U.S. began to look skyward in new ways. Dreams of flying were becoming realized, and the government wanted to support the wave of growth in aviation interest. But as the looming threat of military aggression hit home in the U.S., Central transitioned into a war pilot training center. And in just a few years Central Flying Service became a full-fledged advanced war pilot training center designated by the U.S. government in support of the military, with 65 aircraft and 30 instructors.

The 1940s were a time of explosive growth. Due to WWII, an extraordinary number of aircraft were being built and



Claud Holbert won numerous industry awards, including from Beechcraft, the FAA, and the State of Arkansas.

lots of pilots were being trained, many by Claud in Little Rock. By that time, his methods of instruction were becoming well-known around the country. In 1944 Central acquired a Ford Tri-Motor and began Arkansas' first commercial air service. A few years later, in 1948, Claud took delivery of Beechcraft Bonanza serial number 23 and became The Natural State's first Beechcraft dealer.

The Arkansas River, a major tributary of the Mississippi, slices Little Rock in half. During much of the 1950s Claud actually operated two airports, the main one on the south side of the river and an auxiliary airport in North Little Rock. The main one on the south side was initially called the Little Rock Intermediate Air Depot. It opened in 1917 and was used by the U.S. Army Signal Corps. The Arkansas National Guard started using it for its 154th Observation Squadron in 1926; the same outfit Claud was later a part of. And by 1931, the citizens of Little Rock purchased the site and commercial air service from American Airways began. For many years it was called Adams Field, named after Captain George Geyer Adams of the 154th. He died in the line of duty after years of service in the Squadron and on the Little Rock City Council. He was instrumental in promoting the growth of aviation and the airport. Nowadays, it's officially known as Bill and Hillary Clinton National Airport/Adams Field. It became home to Central Flying Service in 1939.

The little airport on the north side of the river, known then as Central Airport, was required by the Civilian Pilot Training Program, started in 1938 by President Roosevelt, and later the War Training Service program training military pilots until 1956. Thousands were taught to fly at Central Airport, many by Claud himself.

Under Claud's leadership, Central continued to grow during the 1950s and 60s. It developed its own maintenance facilities and eventually added paint, interior and refurbishment shops. Claud amassed an incredible 50,000 flight hours at the helm of his instruction aircraft and charter fleets. He served as the personal pilot for Arkansas Governor Winthrop Rockefeller, the grandson of Standard Oil's John D. Rockefeller of New York. This work was the catalyst for becoming well known as an aviation hub in the area, especially due to few airlines operating in central Arkansas.

Central would later become the first jet charter service in the state. And politics would continue to play a vital role with the company. During one occasion, when Central needed a pilot for Rockefeller, Dick was tasked with the duty. He wasn't the usual pilot, his dad was, but he took the opportunity to fly to Washington D.C. He got Potomac fever while visiting the capitol, but since he was soon starting law school at the University of Arkansas, he knew he couldn't stay. However, while on that same trip and seeing some friends who were working with a Senator there, Dick was asked if he'd work for William Fulbright's campaign, and they'd pay for him to attend Georgetown law school. It was an unbelievable opportunity that he took advantage of. After finishing law school, he became an officer in the U.S. Army.

Brothers Dick and Don Holbert.

Beechcraft recognized Central for its outstanding sales accomplishments in 1964. It had become the first independent dealer to exceed one million dollars in sales. And in 1968, Don Holbert came home after a distinguished deployment for almost seven years in Vietnam with the U.S. Army. Don was a gunship helicopter pilot who had earned the Distinguished Flying Cross for Valor and many

Today, Central Flying Service offers maintenance, flight training, charter, sales and more.

other medals. Central welcomed him home and made him vice president at the company. Dick would leave the military in 1972.

Claud completed his career as the FAA's senior pilot examiner. He turned Central Flying Service over to his sons in 1975 and left us a few years later at the age of 72. The Chairman of the Arkansas State Aeronautics Commission, Eddie Holland, remarked: "Claud always said it wasn't work. It was what he enjoyed." He would go on to fly and instruct until passing in 1983. Don took over as president, and his brother Dick assumed executive vice president duties. They talk fondly about how their dad "retired" a few times but he kept on working until the day he died. The company states: *It must have been hard for a man who lied about his age so he could join the Arkansas Air National Guard in 1926 to walk away from something he'd dedicated himself to wholeheartedly for over 50 years. And by all accounts, Claud Holbert never actually left. His vision, leadership, and integrity are the foundation of Central Flying Service. We carry his passion and commitment to excellence in general aviation with us today. Claud loved to fly. Many who knew him fondly recount that he spent more time in the air and logged more flight hours than anyone else on earth. It isn't hard to imagine. His contribution to aviation in the state of Arkansas is without equal.*

Central Flying Service then entered its second era. Claud's sons Don and Richard had acquired their dad's enthusiasm, not just for aviation but also for the family company. Aviation, politics, and the military dominated their lives.

By 1980, Central was awarded by Beechcraft again. This time, Central's parts department became the first independent Beechcraft dealer to exceed one million dollars in sales. A year later, Don would move to the board as chairman and Dick would take the reins as president of Central Flying Service. Claud was inducted into Arkansas' Aviation Hall of Fame in 1982 before he passed away, and Central continued to amass awards and recognition. It was at this time that "The Greatest Cheeseburger in Aviation History" moniker was bestowed upon Central's newest facility, the Flight Deck restaurant at Adams Field.

However, as we entered the 1990s, changes at Beechcraft were happening. By 1994 Beech was in the process of taking aircraft sales in-house, and as an independent dealer, Central would no longer have that source of pride and revenue. It joined with several other independent dealers and founded the Pinnacle Air Network to speak to Beechcraft with a unified voice and continue to have aircraft sales operations. It was successful, and to this day, many of the Pinnacle members, like Central, are Beechcraft Service Centers.

After Central's acquisition of Midcoast Aviation in 2002, it became the world's largest FBO, with more square footage than any other on earth. Four years later, Don and Dick were both inducted into Arkansas' Aviation Hall of Fame, just like their dad. Don passed away in 2015 at 75 years old. By 2017, the Central Flight Training School logged over 475,000 flight hours.

By the time you read this article, we will know about the next phase of Central's journey. Early in 2022, Dick announced that he had a buyer for Central. It wasn't really up for sale, but an offer came to him that made sense – an offer from someone who understands the history, the legacy and the family. As I am writing, we expect to hear about the purchase and the new owners by the end of March or early April. The intent is for Central to keep its name, its employees and for some of the Holbert family members to say on board, while Dick remains as an adviser, at least for a while. We wish much success to Central 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.**

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by **Kevin R. Dingman**

Bifurcations

A retired airline pilot navigates a divergence.

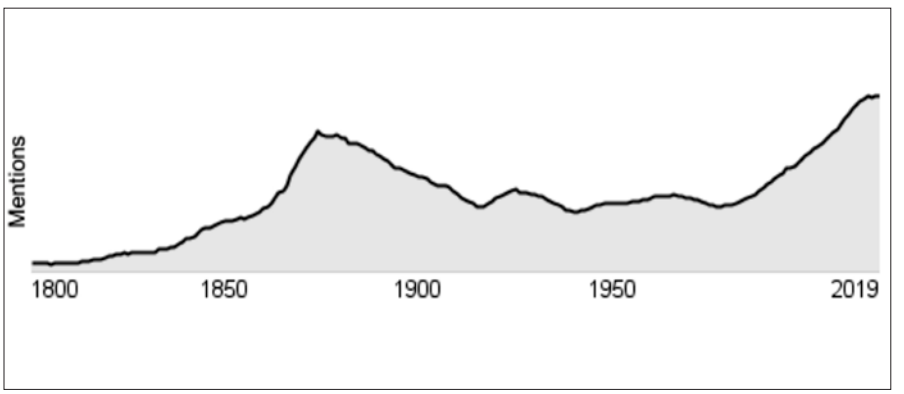
> When you come to a fork in the road, take it.
>
> – Yogi Berra

The story goes that Yogi was giving directions to his home. The road split left and right at the beginning of a large cul-de-sac-like road, with his house being on the backside of the circle. Either way you turned at the fork, you would end up at his house. His instructions thusly yielding another accidentally humorous yet accurate axiom: a Yogism. My retirement from airline flying due to the Part 121 age 65 rule lasted three months and eighteen days (see "Retire Me Not – Part Deux," T &T January 2022). The 108 days in retirement was spent doing my second-most favorite thing: hunting in Michigan and, sometimes, very remote areas of New Mexico. At the bifurcation, I resumed my number one favorite thing. No, not driving Round-And-Round (head nod to Ratt, 1984) in a cul-de-sac, but flying airplanes. Specifically, CE-650 Citation III's under Part 135 and 91 for a local, family-owned outfit and occasionally, contract work in a Citation VII.

verb /ˈbīfərˈkāt/

1. divide into two branches or forks.

The owners of the Part 135 company, plus most of our pilots and other bizjet pilots around the GA system, however, don't seem to be as nonchalant as me about the "I can't fly those days" and "let's play golf" mentality vs. "must fly for food, cancel my (fill in the blank) to cover the trip" mindset. Forty years of flying government jets and working under the umbrella of an airline union contract, and therefore a mostly painless flying career likely precipitated my philosophy. But now, like the tail on a V-35 Bonanza, my new GA flying world is bifurcated – thank you, Ralph Harmon (Beechcraft 1947) and Alan Greenspan (Fed Chairman 2005). That being said about a painless flying career vs. the struggling, hardworking GA pilots, and although paid to fly fighters and airliners since 1984, I did come from the 1970's GA world: FBOs, pumping 80 octane, flight schools, charters, cutting off shirttails, poker runs, pancake breakfasts, Oshkosh with Bobs Shrike Commander, the smell of Mennen aftershave in aerobatic smoke, landing on grass and owning airplanes. And while I have not flown corporate, on floats or in the bush, I understand many of GA's pains, pleasures, profit margins and (bifurcated) paths. While I appreciate these factors in the cutthroat business of GA, readapting to inconsistencies is part of my transition from 121 to 135. In the military and at the airline, every airplane and every pilot were cut from exactly the same high chart. This is not the case in GA.



Use over time for "anthropomorphism." This may be partially my fault.

By the time you reach my age, you've made plenty of mistakes if you've lived your life properly.

– Ronald Reagan

The company owners and our pilot cadre are an eclectic mix of ex-airline and military folks, corporate flight department transfers, "on my way to the airlines" hopefuls and even one really great stick that went straight from single-engine GA to jets. Well within the standard for professional pilots, safety requirements and my crew-concept-comfort level, but unlike the military and airlines (in which we are literally clones of each other), the pilots in this Part 135 outfit and the ones I've met around the system, are all different – a different background, approach to flying, career expectations and to leisure. The owner/chief pilot was an Army helicopter pilot, but for the most part, the rest of the company is owned and operated by a family that is totally home-grown GA. They, and the line pilots' bad-weather comfort levels, desire to fly a lot or not a lot, and their long-range goals all vary widely.

Of the group, I'm both the new guy and the old guy – as indicated on the trip sheets that reflect my um, "seniority." I have to say, it looks and feels weird to see 65 in the age column next to the ones that say 30, 40 or 50 something. Especially since the hangar/office in which I now begin my trips is the exact same one from which a long-haired, bell-bottoms-wearing hippy washed airplanes in 1972 and began his 50-year journey. It's embarrassing – how did I get to be so damned old? And unlike the airlines, in which each airplane of the same type (i.e., S-80, B-737, etc.) are exactly the same inside and out, the 135 and contract jets are all different: different interiors, avionics, instrumentation, paint schemes, post-flight paperwork, call signs and for those contributing to the inclining line on the anthropomorphism chart – different personalities. Lucky for me, all of the other pilots have much more experience in bizjets and how to make them behave despite their "quirks." They are also more accustomed to the level of sophistication displayed by our clientele.

A stabilizer heat controller in a Citation VII kept us from Punta Cana.

Of all classes, the rich are the most noticed and the least studied.

– John Kenneth Galbraith

This is the first time in my flying career that I've been exposed to real wealth – not airline, first-class wealth – use your G550 to transport just the family's cats to Hawaii wealth. My kit bag may be Tumi and wallet Coach, but their luggage and two or three pet carriers are often matching Louis Vuitton, Gucci or Prada. I have yet to see a set of HONMA Beres or Majesty Sublime golf clubs, but so far, I routinely see this year's Titleist, Ping or Callaway's with monogrammed bags (gotta trade in my Epic for a Rogue ST Max LS if I'm going to hang with these folks). Luggage is transported in an Escalade, and the chauffeur transports the clients in a Rolls Royce SUV. I didn't even know there was such a thing – not the chauffeur, the Rolls SUV.

And I love hearing the tales of their self-made success – it's

The view from the new office is still spectacular. (Photo by Captain Steve Lambert).

inspiring. This wealth bifurcation has made me curious about what the private owners of GV's, 737, 757, 777 BBJ's and similar jets must be like as compared to those riding in our (tiny?) Citation III's and X. I've been pleasantly surprised that the charter clients are much more pleasant, humble, well behaved and generally easy-going, as compared to the folks that were flying first-class at my airline (I had nine arrested my last five months as an airline captain). In addition to my first exposure to these fine charter folks, it's also my first exposure to bizjets. I'm flying about eight days each month, with a few of those spent playing golf and luxuriating. Sometimes with the clients or my flying partner, some by myself, all while waiting for the return trip home. Despite an unanticipated discomfort level with initial training, my chief and assistant chief pilots were right: I do love the Citation despite having to climb back on the recurrent training merry-go-round.

If you always do what you always did, you will always get what you always got.

– Albert Einstein (and Tony Robbins)

One thing that I'm trying to change is my aversion to above said training. As described in "Retire Me Not – Part Deux," I thought training for fun vs. "you-bet-your-ticket" Part 121 training would be painless…it was not. So, here I sit, 0300 in the morning reviewing the memory items and limitations for the CE-650. Why 3 a.m.? Because I've been getting up early my entire life: hunting, backside of the clock flying and shoveling or playing in snow. Why study eight months ahead of time for recurrent training? Because I always told myself when at the airline that if I'd only study a little bit all the time, then I wouldn't feel so apprehensive when training was upon me as I tried to cram all the information back into my brain that had fallen out.

Well, this time I mean it. I've already diverted in bizjets because a generator ate itself, sat three hours due to a rudder bias heater failure and missed out on Punta Cana over a stabilizer-heat controller. Good systems knowledge seems like a prudent plan. I'm trying very hard to review something Part 135 or CE-650 related every day. It's distressing to see how quickly the stuff has fallen out of my head. I'm hoping that it's simply because it's a new jet and I don't fly much vs. me being an 8-iron away from age 70.

Modesty is a vastly verrated virtue.

– John Kenneth Galbraith

For those who have never piloted a bizjet, and it may seem obvious, they are just what you would expect in a small(er), light(er) weight machine: taxiing can be squirrely, they're quick to accelerate to V1, roll rate is crisp, turbulence feels like rumble strips and less soft or "mushy" than a 150,000-pound airliner, and the climb rate drops off up high. Fuel use is low, weight and balance can be tight, cockpit layout is inconsistent from plane to plane, and there are a ton of these smallish jets out there. All of the Florida GA airports have been packed this winter. The night of the NBA All-Star game, we were in CLE with a Citation VII and parking was tighter than Oshkosh. While I don't miss TSA, airline terminal food and the "ill-mannered" passengers, I do miss flying an airliner: auto-throttles, auto-brakes, auto-spoilers, VNAV, and HUD or auto-land. But I'm grateful to have the Duke, and I'm happy that I took the fork leading to Part 135. It's fun – even if, andromorphically speaking, they can be moody. And I'm glad that Yogi didn't say "when you come to a bifurcation" because it doesn't roll off the tongue quite as nicely as does "when you come to a fork."

Author Correction: Thank you to the thousands (okay, dozens) that caught my math error in February's story, "Ancestor Worship": "Then, the next descent from 19k to 10k would be: (19-10) x 3 = 18. Start the descent at 18 miles from the fix." We should have started down at 27 miles from the fix, not 18. If we had followed the captain's math, we would have missed the assigned altitude and been violated! Actually, and typically, when ATC noticed we were late starting the descent, they would have (hopefully) said, "Are you starting down?" Or "you gonna make that crossing restriction?" Neither one is the preferred scenario. 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**.

Five Years Later

by **Marc Dulude,** Owner-Pilot

PHOTO COURTESY OF PAUL BOWEN

Five years ago, I wrote an article in the August 2017 issue of Twin & Turbine where I described the process that led to my taking delivery of the 2000th Citation Jet built, a Citation CJ3+. In that article, I noted the enjoyment I get from conducting very detailed comparisons of aircraft candidates, and the one I did before deciding on the CJ3+ was very comprehensive. Now, with five years of operating experience, I wanted to revisit the analysis and provide some additional information that I hope might prove helpful for others considering the purchase of the highest level of single-pilot operated aircraft.

One of the critical reasons I had chosen the Citation CJ3+ over competing aircraft was the tremendous support and interest I had received from Cessna, part of Textron Aviation. At every stage of the investigative process prior to making a decision, Cessna was incredibly responsive to my questions and open to additional visits and questions. In the 2017 article, I also highlighted Cessna's fervent desire that I visit often during the production stage – something that I did several times. Of course, one of the fears might have been that Cessna would change its responsiveness once the purchase was complete. Nothing could be further from the reality that I experienced. Cessna has built their business model around being highly responsive to their customers, and I knew that help was never more than a phone call or email away. As I write this article, I cannot think of a single time that I was truly AOG (Aircraft on Ground) with my CJ3+, but I did have a few times when I wanted to better understand something that had happened and the Cessna resources were immediately brought to bear to investigate to resolution.

Another key criterion for choosing the CJ3+ was that the core avionics panel is the Garmin G3000. In my view, the G3000 and the G1000 NXi are the most capable avionics panels available in the general aviation world today, and I wanted to ensure that this was the system with which I interacted every flight. Garmin has proven exceptionally receptive to input, which has led them to also be the industry's innovation leader – exactly the kind


Marc Dulude

of partner I wanted. Since taking delivery of the CJ3+ in 2017, Garmin has also added new functionality through releases made in coordination with Cessna. They also introduced a CPDLC (Controller Pilot Data Link Communications) offering for the USA that is referred to as FAA DATA COMM, and I've made extensive use of it through my travels. Once again, the partner I had bet on came through as hoped and expected.

As for how the CJ3+ has performed against expectations, it is hard to imagine how it could have been better. In these last five years, including the more than one year of almost lost aviation because of the COVID-19 pandemic, I've flown the airplane beyond where most general aviation pilots tend to go. Prospective buyers often choose the shortlist of aircraft based on numerous performance characteristics that always include range. The range used can be based on several factors, but the range sought is normally derived from the so-called "typical mission." I have found, though, that each airplane I've bought expanded the definition of my typical mission. Trips I would not have really considered with one aircraft become wholly practical with another.

Additionally, many people don't recognize that range equals flexibility. For instance, a trip that I did with some regularity was Savannah (KSAV) to Ottawa (CYOW), a trip length of 840 nm. In my Citation Mustang, it was a trip that I could do most of the time and land with just enough reserves. If the weather was poor for an area around the arrival airport, the trip became much more questionable. In my Citation M2, the trip was more practical, but I often saw large frontal systems that would make the choice of a true alternate challenging. In the CJ3+, all those concerns are gone. A friend of mine followed along my path going from Mustang to M2 to CJ3+, and shortly after he acquired his CJ3+, he called to ask me advice on selecting an alternate when a widespread area had low ceilings and visibility. I highlighted for him some places he could pick that were VMC despite being 250 nm away from his destination airport. The increased range provided much more flexibility and safer operation.

In another case, I needed to get from Iowa to Newfoundland from one day to the next. The trip was 1,650 nm with a small tailwind lasted four hours. I landed with more than 1,600 pounds of fuel – that's more than two hours of cruise fuel! A friend of mine transports his extended family in his CJ3+ between various family destinations, routinely carrying a total of eight people and, on occasion, filling all 10 seats on board. Again, the fuel carrying capability that provides the range also creates the flexibility to make these trips.

Being able to go these long distances also depends on an efficient airframe. The CJ3+ routinely exceeds its book values like all modern Citations. According to the flight planning and performance manual, the plane's maximum cruise speed at FL450 and ISA conditions is supposed to be 385 KTAS if departing at maximum takeoff weight. Its maximum cruise speed is at

a somewhat lower altitude. I routinely fly at well over 400 KTAS at FL450, sometimes even faster than 410 KTAS at that highest cruise altitude when the plane is lighter. The most recent release of the G3000 software (V4.8 for Citations) has a comprehensive flight and performance planning capability that adds an airspeed bug depicting the book value under the actual conditions. Almost always, the indicated airspeed at cruise is 8 to 12 KIAS higher than the cruise book value. So, given that I based my purchase decision on the book values of each aircraft, I am elated with how much better the performance has been in actual use.

One of the penalties that operators typically pay for such capability is much longer runway requirements. Although nobody can claim that the CJ3+ is a STOL aircraft, its landing and takeoff performance is impressive. I landed the CJ3+ at Mackinac Island for a regional event with the Citation Jet Pilots (CJP) association, the world's largest owner-operator group focused on Citation aircraft. The airport has a single runway 3,501 feet long. I landed and had to power up to get to an exit taxiway, having used less than 2,500 feet of that runway. I have the G3000 option called Surface Watch installed that shows airport information in many forms, including the distance remaining on the runway. I routinely depart my home airport using less than 2,000 feet of runway. Once again, the CJ3+ had proven to outperform the book values in every category.

In Gilbraltar with N825MD during an international trip with AirJourney.

Additionally, the amount of storage space available on the CJ3+ has exceeded my expectations. It's one thing to list these quantities in a comparison sheet and another to be able to use all that space in planned flights. For instance, I flew to pick up a group of professional golfers I know to fly them to their next event. And believe me, they travel heavy carrying large tour golf bags and heavy-duty luggage able to withstand any kind of rough treatment. They also need to carry additional equipment to best prepare for their tournament play. The CJ3+ holds 1,000 pounds of luggage in its two large storage areas. The two Citation aircraft I considered in my analysis were exceptionally well-positioned in this category.

I will also note that I have been pleasantly surprised by the WIFI capabilities onboard. When I ordered the CJ3+ and specified the list of options, I included the Gogo ATG system. I believe I was the first person to have installed an ON/OFF switch in the panel since successfully negotiating the use of hourly pricing for CJP with Gogo. In fact, the system has worked so well that I now consider it as virtually a required piece of equipment. Gogo introduced new technology under the brand name AVANCE, and I am currently scheduled to upgrade my system to that new architecture soon.

A friend of mine recently sold an aircraft he had bought not long ago and is moving back to his previous aircraft type. Although there was much to like about his new choice, too many areas had not lived up to expectations. That often happens as aircraft sales information is difficult to wade through and find what you can certainly expect after purchase. But with five years behind me in the 2000th Citation Jet built, a CJ3+, I can say that the plane has outperformed in every category and the reasons why this jet is so popular are clear. T&T

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Distance Learning

Although I have no evidence to prove it, I think pilots of turbine aircraft are spending less time hanging around the airport regaling each other with flying tales. Most of them grab a rental car after landing and are off to a business meeting or family event. And COVID hasn't helped the situation.

It's a lost opportunity to share experiences and perhaps even save a life or two.

At the Citation Jet Pilots Association (citationjetpilots.com/safety), we have created a workaround. It's called "What Good Looks Like" and is a video series available free to any pilot. Yours truly volunteers to fly a less than perfect flight in a FlightSafety International simulator, and then safety consultant, Neil Singer, demonstrates the "right way" to do it.

The series, now in its fifth year, began by showing things like engine out procedures and maneuvers you might expect to see in your recurrent training.

Then, something interesting happened. Call it "virtual hangar flying."

Our safety foundation chairman, Tom Abood, shared a scary incident while flying his Citation CJ3. Right after takeoff, in low ceilings and icing conditions, Tom had his stick shaker engage. For those unfamiliar, the stick shaker causes the control column to vibrate vigorously, warning of an impending stall. A problem with the angle of attack vane in Tom's airplane was sending invalid data to the stall warning system. We literally never train for this type of failure, and Tom was experiencing it in real-time, IFR conditions. This story could have had a nasty ending, but Tom set the appropriate pitch and power settings and maintained control.

Finding folks willing to share a story, especially if it calls attention to a less than perfect flight, is often challenging.

"Tom, could we tell your story in one of our videos?" I asked. "Sure, I'll be happy to help," he responded. He then met me in Wichita and we strapped into the simulator.

In the video, "Flight Control Stick Shaker," you can see me experience the event and hear in Tom's own words exactly what he was thinking as it happened. It's worth watching even though it's unlikely it could happen to anyone else.

But it did.

Several months later, one of our CJP members, Michael de Nigris, posted a story about his stick shaker inadvertently engaging right after takeoff. He and his co-pilot briefed the event and the possibility that it might happen again on approach to landing. Sure enough, it did. They simply flew as Tom did and made an uneventful landing.

I was amazed, and I answered Michael's post with a reference to the video we had produced about Tom's incident.

"I know all about the video," said Michael. "I watched it a couple of months ago and remembered what Tom did while my stick shaker was vibrating. My situation was basically a non-event because of the video."

Tom's sharing some virtual hangar flying made Michael's flight a little safer.

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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