TWIN & TURBINE

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

AUGUST 2020 $3.95 US
VOLUME 24 NUMBER 8

LOW AND FAST

THE WORLD OF AGRICULTURAL AVIATION

Buying and Selling in Today's Market

Cessna 421C vs. King Air C90

PilotTube Part Three: CitationMax

"DANKA, STEVENS!"

On time. On budget. Exceptional work. That's how you earn respect from around the world. This spring, working with a German customer, Stevens performed the pre-buy for this King Air 90, then installed a G-1000 avionics suite, MT 5-bladed props, winglets, strakes, as well as custom interior refurbishment and partial paint. Seventy years ago, we began building a reputation for technical expertise and personal engagement. Airplanes have changed since 1950, but the Stevens commitment to a great customer experience remains the same.

STEVENS AEROSPACE AND DEFENSE SYSTEMS

EST.1950

SOAR WITH THE LEADER

www.stevensaerospace.com | 1-800-513-9164 | Greenville SC | Macon GA | Nashville TN | Dayton OH

TWIN & TURBINE

EDITOR
Rebecca Groom Jacobs
rebecca@twinandturbine.com
EDITORIAL OFFICE
2779 Aero Park Drive
Traverse City, MI 49686
Phone: (231) 946-7770

PUBLISHER
Dave Moore

PRESIDENT
Dave Moore

CFO
Rebecca Mead

PRODUCTION MANAGER
Mike Revard

PUBLICATIONS DIRECTOR
Jake Smith

GRAPHIC DESIGNER
Marci Moon

TWIN & TURBINE WEBSITE
www.twinandturbine.com

ADVERTISING DIRECTOR
John Shoemaker
Twin & Turbine
2779 Aero Park Drive
Traverse City, MI 49686
Phone: 1-800-773-7798
Fax: (231) 946-9588
johns@villagepress.com

ADVERTISING ADMINISTRATIVE COORDINATOR & REPRINT SALES
Betsy Beaudoin
Phone: 1-800-773-7798
betsybeaudoin@villagepress.com

ADVERTISING ADMINISTRATIVE ASSISTANT
Shannon Martin
Shannonmartin@villagepress.com

SUBSCRIBER SERVICES
Rhonda Kelly
Kelly Adamson
Jessica Meek
Jamie Wilson
P.O. Box 968
Traverse City, MI 49685
1-800-447-7367

To change mailing address, email *rhonda.kelly@vpdcs.com*

Twin & Turbine (ISSN 1945-6514), 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. All rights reserved. Copyright 2016, Village Press, Inc. 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.

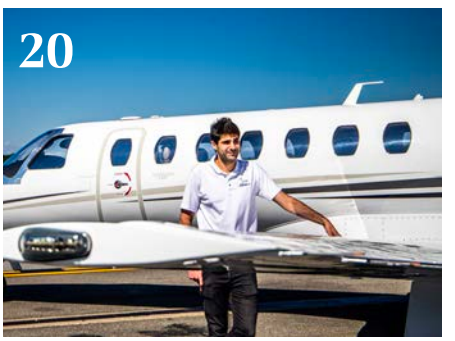
ADVERTISING: Advertising in *Twin & Turbine* does not necessarily imply endorsement. Queries, questions, and requests for media kits should be directed to the Advertising Director, *Twin & Turbine,* P.O. Box 968, Traverse City, Michigan 49685. Telephone 1-800-773-7798. Website: *www.twinandturbine.com*.

MANUSCRIPTS: *Twin & Turbine* assumes no responsibility for unsolicited manuscripts, photographs, or art work. While unsolicited submissions are welcome, it is best to query first and ask for our Writer's Guidelines. All unassigned submissions must be accompanied by return postage. Address queries and requests for Writer's Guidelines to the editor.

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

Contents

AUGUST2020 • **VOL. 24, NO. 8**



COVER PHOTO:
Photo Courtesy of Air Tractor

Issues of Twin & Turbine are available for free *www.twinandturbine.com*

Editor's Briefing

by **Rebecca Groom Jacobs**

Good Time to Buy/Sell?

For a few months now I have heard the same hopeful sentiment repeated from folks all across business and general aviation – "GA will see a jump in sales thanks to COVID and the increased interest in private travel." Heck, I have been saying (or hoping) it, too. It makes sense. Undoubtedly, more people and businesses are out there with the means for aircraft charter or ownership but previously lacked the motivation to make the leap. I don't think it's a stretch to speculate that ongoing health risks and growing inconveniences associated with commercial travel will provide such motivation.

But, I wanted to check that hypothesis with what salespeople are currently seeing on the aircraft market. Are they already seeing increases in activity? And for current owners, is the COVID-19 era a prime time to buy? To sell? Or is it advisable to wait until the waters calm?

Based on insights from the aircraft dealers I spoke with, there was an obvious dip or pause in transactions from March to mid-April, but as pandemic-related restrictions lifted, sales activity came back – and it came back fast and furious. Discounts can especially be found in the midsize to large-cabin jets. As you enter more into the owner-flown pistons and turbines, the competition gets tougher and more unpredictable. Here are some of those insights straight from the aircraft sales front line:

> *"The light aircraft marketplace is very active, perhaps due to a combination of rising demand for mobility and opportunistic purchasing by latent buyers. They had been waiting for a chance to jump into the marketplace. This is a reason for cautious optimism, but to be frank – it's still a buyer's market for the time being. And that is a good thing because we are all buyers. If you are a seller, be deliberate, consider enlisting the help of a professional, because the increased competition demands it. If you are a buyer, hurry up before the market takes off without you!"*
>
> – Jesse Adams, Sales Director, Aerista (Primarily Piston/Turboprop Sales)

> *"The overall trend we are seeing is a renewed interest in private air travel. The airline experience has continually declined over the past two decades, and this new health threat is just another reason to fly your own plane. And now is a good time to buy…and sell. Quality aircraft are changing hands daily and interest rates have never been lower. My advice today would be the same yesterday and tomorrow: do your homework! Regardless of which side of the table you are on, enlisting the aid of an experienced aircraft dealer/broker is money well spent. Sellers tend to have a blind eye when it comes to the value of their aircraft and may set an unreasonable asking price. Likewise, buyers often do not know their true mission profile and may seek an ill-suited model. A sales professional can help avoid these potential frustrations."*
>
> – Jonathan Lones, Vice President of Sales, Flightline Group (Primarily Turboprop Sales)

> *"There are definitely pockets of opportunity and you can find some really good buys in today's market. Even if you have to sell your current aircraft before you can get into a new one, don't think there aren't any buyers. There are. And yes, you may end up taking a lower price on your current aircraft, but the savings you'll realize on the new aircraft may far outweigh the loss on the current one. Also, don't forget that bonus depreciation is scheduled to begin phasing out next year. And depending on the outcome of the election, may go away completely. So do what all savvy entrepreneurs do – find opportunity in any situation, because they're there."*
>
> – Kandi Spangler, Sales Director, jetAVIVA (Primarily Jet Sales)

Judging from the experts above, it appears the incredible freedom of mobility and personal safety provided by general aviation is really starting to ignite the industry. We hope and pray that the pandemic will abate in the months ahead, but I have to believe that the amazing value of private flying will continue to attract new customers for years to come.

ice shield PSA™
de-icing systems

PRESSURE SENSITIVE ADHESIVE (PSA) WING BOOTS HAVE ARRIVED!

Visit IceShield.com/PSA or contact an Authorized Ice Shield Distributor for more information

Ice Shield is pleased to offer Pressure Sensitive Adhesive (PSA) wing boots. Simialar to the FASTboot®, Ice Shield PSA allows minimal aircraft downtime and easy installation. Contact an authorized distributor to purchase today.

Ice Shield & Ice Shield PSA products are available for sale worldwide!

IceShield.com/PSA • 800-767-6899 • info@iceshield.com

"The World Turned Upside Down"

In many ways it feels like we've been living the words from the popular musical "Hamilton" in Act 1. According to legend, which is further propagated in the Broadway production, the British army band played an English ballad entitled "The World Turned Upside Down" during their retreat at Yorktown in 1781.


THE
World turn'd upside down:
OR,
A briefe deſcription of the ridiculous Faſhions of theſe diſtracted Times.
By T. J. a well-willer to King, Parliament and Kingdom.
London: Printed for John Smith. 1646

The siege of 2020, too, has turned many worlds upside down.

If you're like me and plenty of others, your 2020 plans were severely rerouted or outright grounded. For a pilot in the pre-COVID days, a go/no-go decision was focused on evaluating the weather and doing the IMSAFE self-assessment on your fitness to fly. Now we can add a few more considerations: virus hotspots and what quarantine mandates exist at your home base and at the destination. Maybe someone cleverer than me can come up with a catchy acronym for that.


Owner-pilot Suraj Nagaraj recreated the G1000 Piper Meridian cockpit.

Presently, my home state of Kansas has a list of states that if you visit you must undergo a 14-day quarantine upon returning home. One of those states happens to be where my eldest daughter lives and is training with the Navy – Texas. Not that I particularly want to visit the highly COVIDized area where she lives, but any thought of visiting her is a "hard no" right now.

Another COVID casualty: my annual 10-day flying adventure to the Out Islands of the Bahamas was canceled. I was heartened to see that the country is attempting to reopen, albeit with some fairly onerous requirements, including a negative COVID-19 test within the last 10 days. If you happen to get sick while there, treatment and travel back to the United States could be tricky. As much as the country depends on tourism dollars for its survival, I know I'm not alone in choosing not to take the risk just yet.

Some pilots have come up with creative ways to keep current on their skills and buttonology during the pandemic. Owner-pilot Suraj Nagaraj has created an amazing home simulator that has recreated his G1000 Meridian cockpit. He did it using X-Plane 11 flight simulator, three 50-inch HDTVs, a computer with a fast processor and good video card, and RealSimGear G1000 hardware. Carenado offers software expansion packs that cover a wide variety of airframes. According to Suraj, it is a great way to retain currency and keep from going bonkers during the pandemic.

Aviation events are turned upside down, too. It was heartbreaking but not surprising when AirVenture Oshkosh was canceled, followed by AOPA, NBAA, and others. MMOPA, the organization I helm, had postponed its spring convention in Tucson until September. That was before a mushroom cloud of COVID formed over Arizona, leading us to cancel the event.

But with adversity comes opportunity. Every organization and company is re-inventing how we can connect, communicate and share knowledge. EAA held a virtual Oshkosh that featured a virtual expo and a robust schedule of streamed and on-demand content.

MMOPA also is planning a virtual event called MMOPA 2020 LIVE to replace the in-person convention. The event will be live-streamed with hosts broadcasting real-time and a wide variety of presentations, inspirational talks, roundtable discussions and virtual happy hours. While it's not exactly the same as being there, the event will allow a larger number of members to participate, including a large international contingent. In fact, this may be our best attended convention ever, although it will forever have an asterisk next to it.

One thing for sure, much of this is uncharted territory. Life may never be the way it was. It will be different – maybe not worse, maybe not better. Just different. And those of us game for adapting and not fighting the turbulence are bound to come out the other side in good shape. Just as in flying, sometimes you have to deviate.

As Hamilton put it (as interpreted by Lin Manual-Miranda), "See you on the other side of the war." T&T

Dianne White *is the executive director of MMOPA and editor of MMOPA Magazine. For a total of 14 years, she was editor of Twin & Turbine and has worked in the business aviation industry for nearly 30 years. She also serves on the board of directors for Angel Flight Central. An active multi-engine, instrument-rated pilot, Dianne lives in the Kansas City area and can be reached at* **editor@diannewhite.com.**

Piston Power Series

Cessna 421C vs. King Air C90

by **Joe Casey**

PHOTOS COURTESY OF PAUL BOWEN PHOTOGRAPHY

Let's say you've got a family of six, and the kids are barely kids anymore. You used to be able to haul everyone around in a Piper Malibu, a Cessna 210 or a Cherokee 6, but the kids keep growing and waists keeps growing. Suffice it to say that your family is not what it used to be in terms of weight, and you want to be able to carry everyone when you go on family trips.

Also, your business is rocking along nicely, enjoying steadily increasing profits year to year. And while you used to just fly yourself around to business meetings, you now find yourself flying passengers more and more. A bigger airplane would sure be nice.

Bottom line, you are ready to move up. What is the next logical step?

Any of the "big fuselage" King Airs just seem like too much airplane, both in cost and size. The MU2's performance looks cool, but you plan to fly 100 hours per year and self-admittedly, you know you are not Chuck Yeager's protege. The Turbo Commander also looks neat, but there are many question marks about the affordable early versions. A TBM would do the trick, but dang, seven digits are required to enter that world.

The bottom line is you have $300,000 to $450,000 for a budget, and you don't want to make a mistake. Can you really afford to purchase and feed a cabin-class twin? A cabin-class turbine twin? The answer is maybe, and your search will likely result in the King Air C90 and the Cessna 421C on your shortlist of prospective airplanes.

Similarities

When looking at either a King Air C90 or a Cessna 421C, the first thing you'll notice is their impressive size. Stepping into either cabin reveals seats that are wide apart and comfortable for all sizes of people, even the tall and wide. It's a long hunched-over hike for the pilot up the aisle between the seats, but that pilot is welcomed to a large cockpit with plenty of panel for the latest gadgets, lots of legroom and large comfy seats. In both airplanes, the pilot sits high off the ground with a "grand appearance" view noticeably different from any piston single.

Both have solid all-engine operating performance numbers, with the C90 climbing a bit better and cruising a bit faster. The C90 will average about 220 KTAS while the 421C averages about 205 KTAS. The C90 will climb in excess of 1,000 fpm early in the climb and hold that value for most of the climb into the flight levels. The 421C will hold 1,000 fpm early in the climb, but the engine temps will require a cruise climb airspeed that will net about 600 fpm when leveling off in the flight levels. With cabin size and performance so similar, what are the true differences for the discriminating buyer?

King Air C90

The King Air 90 came out in the late 1960s and quickly developed a reputation as a great airplane. Before long, the A90, B90 and C90 became available. Of course, there are E90s and F90s and a whole lot of modifications to make the C90 like the newer and faster versions, but the C90 is the most prolific version of the King Air 90. Why? The C90 is the version that holds true to the unofficial design mantra of the entire King Air fleet: "In no single aspect of consideration is it the best, but in every category, it is really good."

The C90 is not the fastest, most powerful, nor will it go the farthest, but you get a lot for your money, both in airplane and performance. The C90 is sneered at by the pro pilots for being a slow turbine, but those who really know best will testify that the C90 shows up just a little later on most trips than some other sleek airplanes, and the owner doesn't have to empty the bank account to buy it or fly it.

In the King Air C90, there is a potty system that actually works, giving passengers comfort. The belted potty is so nice that if all the seats are full, a wise passenger might even select the potty for the long ride as opposed to the main cabin seats. Plenty of legroom and plenty of privacy exists. There is also ample luggage space in the C90. You can really carry six people, all of their bags, and still leave room for enough fuel to go a long way. It is a comfortable cross country cruiser that is still a rugged, strong Beechcraft King Air.

But, the best part about the C90 is the PT6 engines. The PT6-21 engine came standard on many of the C90s, and I think it is one of the best engines ever. There are literally thousands of -21 engines flying around the planet, so finding a maintenance provider with experience is easy. Like the C90, it is not the "sexy" big engine found on some other airplanes, but it is a rugged and smooth engine that hums along without a whimper. Once you get it started, it likely won't fail unexpectedly unless you run the fuel tank empty. Bulletproof. That's the PT6-21.

Cessna 421C

The Cessna 421C was Cessna's flagship of the multi-engine piston world and arguably still is—except that they aren't being made anymore. Few manufacturers today have a multi-engine piston flagship, but don't let that fool you into thinking that the Cessna 421 is not a good airplane. There are a lot of Cessna 421s in the world, and they make remarkable purchases for the savvy buyer.

The Cessna 421 first became available in the late 1960s, quickly gaining popularity as an airplane with a big cabin, solid performance and sexy looks. It was a great step up from a Cessna 310, Cessna 210, or even an unpressurized Cessna 300-series. Sales were solid and improvements soon came along. The pick of the litter is the latest model, the Cessna 421C. The C-model has the best fuel system, trailing link landing gear and the newest year model. Clearly, the C-model is the most desirable in the marketplace today.

However, the Cessna 421C gained the reputation for having engines that were particular – and that is not a good thing. The geared Continental engine requires a knowledgeable, well-trained pilot. Simply put, power management is critical to the long life of the engine. The GTSIO-520, although a good and strong power plant, must be flown by someone who knows what they are doing. It doesn't suffer neglect, abuse or disrespect well. Treat it well and it'll provide years of solid performance. Treat it in any other fashion and it'll eat you out of house and home and hangar.

And oh my, does it require maintenance. Any piston engine requires more maintenance than a turbine, but the Cessna 421 is nearing 50 years old, and anything 50 years old with lots of moving parts will go to the maintenance hangar frequently. With the big twins, there's double the power available and double the number of things that can go wrong.

NATIONWIDE AIRCRAFT FINANCING

• Specializing in Turbo Prop Aircraft – 1980 & Newer

• 27 Years Financing Aircraft Only

• Best Rates, Terms & Service in the Industry

• Fast Turnarounds

MHF
MILE HIGH FINANCE CORPORATION

Call Dan at **800-439-4860**
www.milehighmoney.com

Match Your Need

So, at the end of the analysis, both a C90 and a 421C will accomplish your mission, and both will be much more expensive to operate than any single-engine piston. But, which do you select? My advice is to make sure you match your need to the airplane you are going to buy.

The big-piston Cessna 421C could be the exact answer to your traveling needs, and if your budget is $350,000 to $450,000, you can get one of the nicest Cessna 421Cs on the planet. You should be able to buy a 421C with super nice paint and interior, a well-stocked panel of avionics, low engine and airframe times and an example with no damage history.

That $450,000 will also buy you a C90, but that C90 will be an older 1970s version, may not have the latest avionics, may have tired paint and interior, and the engines may be mid-life. But, it'll be a turbine, and that is scary for the uninitiated.

If you go for a Cessna 421C, make sure you place a high value on the maintenance pedigree. Maintenance in any airplane is a "pay me now or pay me later" situation. If the present owner has been skimping on maintenance, you don't want to pay anywhere near retail. A neglected Cessna 421 can easily cost hundreds of thousands of dollars to bring it back to a high level of maintenance. And there are lots of Cessna 421s languishing outside in the weather on ramps all over the United States. But if you can find that cherry Cessna 421C, and you don't mind paying to keep the maintenance at a very high level, it could be the perfect airplane for your mission. You can buy a lot of airplane for the money.

But, if I can afford to fly behind a PT6, I'm going to fly behind a PT6. To me, the engines are the critical factor and this is where the C90 shines. I can handle tired paint and less-than-stellar interior. I don't mind steam gauges if they are being pushed by a nice GPS unit and a good autopilot. So, if you can find a "good bones" C90 with good engines, you've got something worth pursuing.

Summary

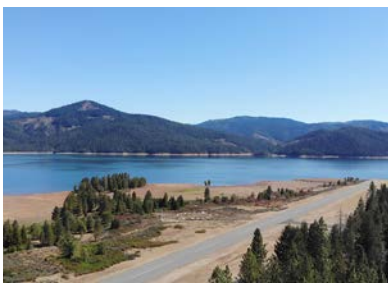
Ready to enter the turbine world? If so, the C90 is a great way to get into the game. But, I advise buyers to consider their cash reserves and their appetite for the big expenses. If a $200,000 hit would throw your company out of business or force you to sell the airplane, stay in the piston world and buy a Cessna 421. Just accept the mosquito bite maintenance requirements that come along with owning a big piston airplane. But, if you are cash-solvent with income that you can predict far into the future, and have a mission that regularly requires four to seven people, then go for the King Air C90. I have a lot of flight time in both, and would gladly own and pilot either if it fit my mission. T&T

Joe Casey *is an FAA-DPE and an ATP, CFI, CFII (A/H), MEI, CFIG, CFIH, as well as a retired U.S. Army UH60 standardization instruc-tor/examiner. An active instructor in the PA46 and King Air markets, he has accumulated 14,300-plus hours of flight time, with more than 5,200 dual-given as a flight instructor. Contact Joe at joe@flycasey.com or 903.721.9549.*

For sale: The Trinity Airporter Resort

Located in Beautiful Trinity Center, Trinity County, CA - with a 3,215 foot paved runway!







The property features a restaurant & bar area that consist of approx. 4,250 square ft, that offers a full kitchen, large prep area, walk-in refrigerator, locked liquor room and ample storage, plus main office. Accompanying this building is a 2 bedroom, living room, kitchen, bathroom and with large decking over looking Trinity Lake. Separate building entitles you to 8 hotel rooms with lake views, next building comes with a 2-bedroom cabin, living room, dining area, bathroom and private patio. A one-bedroom chalet cabin with kitchen, large living room, bathroom and private deck, and yes there is more…. A 3-bedroom, 1.5 bath home…Plus a public bathroom, public laundry room with two washer hook ups and two dryer hook ups, RV hook ups, plenty of parking & all with great views of Trinity Lake. Property is next to the Trinity Center Airport and Trinity Lake on 3.87 acres of flat and gorgeous land… what a great opportunity for multiple VRBO's, air B & B's, company retreats, family compounds, rent some of the buildings, or all of them!

BIG VALLEY PROPERTIES
www.bvptrinity.com

Shannon Aikins Realtor® SFR, CNE • Big Valley Properties 1313 S. Main St. • P.O. Box 1263 • Weaverville, CA 96093
Office 530-623-5690 • Cell 530-524-2479 • DRE# 01701263
saikins@copper.net

www.bvptrinity.com

PHOTO COURTESY OF AIR TRACTOR

LOW AND FAST

THE WORLD OF AGRICULTURAL AVIATION

by **Grant Boyd**

According to the most recent survey by the National Agricultural Aviation Association (NAAA), there are approximately 3,500 agricultural pilots and 1,560 aerial application operations throughout the United States. Though a lesser-known side of aviation, the small businesses and pilots making up the industry play a vital role in helping farmers produce a safe, affordable and abundant supply of food, fiber and biofuel, as well as protect forestry and control health-threatening pests. As it is a predominantly turbine-powered fleet (84 percent), I sought to learn more about the ag aviation world by visiting Heinen Brothers Agra Services in Seneca, Kansas.

Meet an Operator

Heinen Brothers Agra Services operates more than a dozen bases outside of its home in Northeastern Kansas. Naturally, most of the company's locations mirror states with the heaviest concentrations of aerial application operations, including Kansas, Nebraska, Missouri, Iowa, Texas, South Dakota and Louisiana. Operating around 20 aircraft, the company's pilots fly several hundred hours per year over an average four- to five-month season (with July and August as the season's peak).

Scott Heinen, a commercial pilot and aviation science graduate, founded the outfit in 1994. After growing up on a farm with an early interest in aviation, combining the two areas wound up being a natural career fit. Shortly after creating what was then known as Nemaha Valley Aerial, Scott's younger brother Glenn began working for the company while in high school and soon became one of its full-time pilots. Glenn had more of an interest in the crop science side of the business and went on to earn a degree in Agronomy. While still in college, the younger Heinen took on more of a formal role within the company and ultimately became a full partner in 1999.

PHOTO BY AUTHOR


PHOTO BY AUTHOR

The brothers' skills and interests are a natural complement to one another, enabling the company to grow significantly from a two-men, one-plane operation. Yearly, the company's pilots spray several hundred thousand acres of fields, ranches and other lands where either the terrain is too rough for equipment or aerial spraying is more efficient.

"What we spray depends on which region we are operating in," said Scott. "For example, in Kansas, we predominately see corn, wheat, and [soy] beans. But in the South, we see some different things like cotton."

This diversification in spraying location and crop type has enabled the company to grow in size and scope and lessen concern if a particular crop experiences hardship. For instance, Scott noted the stay at home orders resulting from COVID-19 negatively affected vehicle driving hours, reducing the need for corn used in Ethanol.

Ag Flying

To an even higher degree than other types of flying, crop dusting is heavily reliant upon weather, which dictates how many of the seven days that the pilots can fly. On flying days, the job is truly a "sunup to sundown" affair, and pilots can be hard-pressed to spend much of their day outside of the cockpit. During my visit to Seneca, the job's intense demands were reiterated by everyone I spoke with, yet never in a resentful tone that perhaps people in other professions who are "forced" to work all day may express.

Glenn spoke positively about how the previous day he had flown for 15 hours, with roughly 15-minute breaks for fuel and rest. Seeing as money comes in only when crops are being sprayed, the industry standard is to turn and burn as long as there is light, only shutting down the planes when work is done for the evening.

To keep the aircraft in airworthy condition, the company employs three full-time mechanics, along with several pilots who are also capable of turning wrenches. With Heinen's fleet all propelled by Pratt & Whitney PT6 engines (a decision they made several years ago to standardize their inventory), the complexity in maintenance tasks is lessened. That being said, the maintenance crew must work extremely hard to maintain nearly 100 percent operational availability during peak season as a plane sitting in the hangar doesn't make any money.

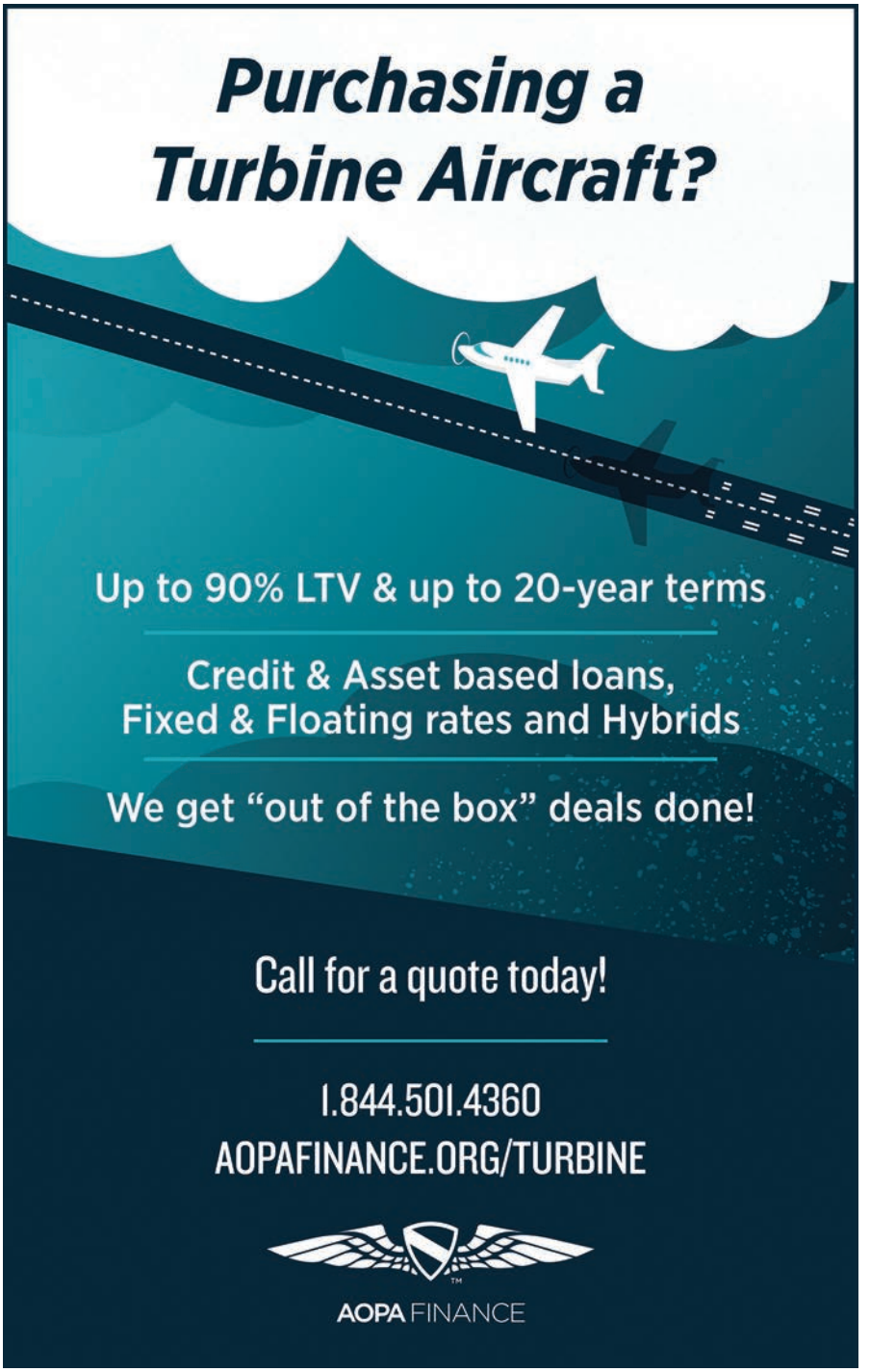
Across the ramp from the company's maintenance hangar, which takes up the lower level of their office building, sits one of their storage hangars that houses several aircraft.

The Planes

Heinen Brothers Chief Pilot Jim Uselton has more than 35,000 hours flying ag planes and spoke to me about the company's aircraft and general agricultural flying operations. He had just returned from a multi-day trip to Northeastern Oklahoma, where he sprayed several thousand acres of ranchland. On this day, he and his Air Tractor AT-802A were taking a well-deserved break caused by low ceilings and the imminent threat of storms.

Jim's model aircraft (AT-802A) gained its name due to how many gallons of liquid (whether it be chemicals or water) that fit in the "hopper" – a nomenclature followed by Air Tractor for all its planes. As "the world's largest single-engine ag aircraft," it can haul 800 gallons of spray with 254 gallons of fuel aboard. The plane can fly for several hours before the tanks need to be refueled.

Although this is achievable, Jim notes that being loaded down that heavily is an exception. A more realistic condition would be about half fuel, which is enough for about a two-hour spraying mission. The seasoned pilot, who first cut his teeth in his late teens flying Piper PA-25 Pawnee spray planes for his dad, discusses several qualities unique to ag planes.



Spraying System

The spraying system is what sets an ag plane apart from other beefy-winged aircraft with a turbine engine. Chemicals are transferred to the hopper from an exterior storage source in the same fashion that the aircraft is fueled through a single point. When needed during flight, the chemicals are drawn from the hopper by pressure caused by the pump driven by the air that rotates the system's propeller under the front of the aircraft. The liquids are routed down the length of the aircraft and out through one of the few dozen nozzles under the wing, where it is spritzed upon the crops below.

GPS/Computer Software

One of the stark differences between ag planes of today and those of the past are the complex computer systems the pilots utilize to help guide them along the spraying path as well as advise on the amount of chemicals to offload. Jim walked me through some of the software, of which one device, the Satloc G4, stores each flight's data – down to how many chemicals were sprayed and on which portions of the subject property. After a flight, these details are exported to the company's computers to demonstrate to customers where the pilots applied chemicals. Coupled with modern glass instruments, air conditioning and ADS-B, the digs inside of these planes rival that of other aircraft in this magazine.

Aircraft Construction

A key focus of the industry and its pilots in recent years has been risk reduction, with several educational programs and initiatives developed. While they have seen high levels of success, all risks cannot be eliminated, and it is statistically low that a pilot will not have a crash during their career. Jim notes that the AT-802A, like most ag planes, "flies and is built like a racecar." With the cockpit constructed out of 4130 Chrome Moly tubing in a roll cage style and fronted by polycarbonate windows, the helmeted and often Nomex-suit wearing pilots are relatively safe in their airbag-equipped five-point harnesses.

Flying Demo

While the weather was unfortunately not conducive for a day of crop dusting, Jim was kind enough to offer me the opportunity to photograph a couple of low passes. After towing N803HB from storage, down the gravel road, and into a spot adjacent to the chemical loading spot, it was time for startup.

Upon hearing the turbine kick over, it wasn't long before the plane was airborne and I got more of a feel for what the aircraft was capable of. While not laden down with much fuel or spray, it was still surprising to see how nimble the 36-foot (fuselage) by 59-foot (wing) bright yellow aircraft is. In simple man's terms, ag operators spray a field

AG AVIATION FACTS

- In the early days, aerial applicators were known as "crop dusters" because they worked with dry chemicals, mostly insecticides.
- The agricultural aviation industry treats 127 million acres of cropland aerially each year.
- The five most commonly treated crops among aerial application operators are corn, wheat/barley, soybeans, pastures/rangelands and alfalfa.
- On average, each aerial application business has 2.3 aircraft, ranging in price from $100,000 to nearly $2 million depending on hopper size, engine type and engine size.
- The average hired aerial applicator pilot has 19.4 years of experience in the industry; the average aerial applicator operator has 27.9 years of experience.
- Today's aircraft utilize sophisticated precision application equipment such as GPS (Global Positioning Systems), GIS (geographical information systems), flow controls, real time meteorological systems and precisely calibrated spray equipment.

Source: National Agricultural Aviation Association

in the same method that it would be mowed. Depending on barriers like poles and wires, the pilot will turn around and spray a strip right next to the one that they just laid down and continue until it's all covered.

Several seconds after tires left the pavement, Jim did a 180-degree turn and pointed the five-bladed propeller right at me. Going about 130 miles per hour, an average spray speed in the aircraft, he buzzed past about 50 feet above me, guided by a laser altimeter. Upon reaching the end of the runway, he immediately pulled the aircraft up, pitched about 60 degrees to the right, and quickly settled it back onto its path parallel to the runway.

Next, he demonstrated a more realistic height from where crops would be sprayed. With his tires almost kissing the earth, he again made a speedy pass and demonstrated how stable of a platform the aircraft is. Soon, the show was over, and the flying farm machine settled back down. This flight was only a brief show of the aircraft's capability and mission, but impressive to witness up-close.

For more information, you can visit *www.heinenbrosag.com* and *www.agaviation.org.* T&T

Author's Note: *I would like to give a special thanks to Scott Heinen, Glenn Heinen and Jim Uselton, and Colleen Isaacson and Andrew Moore from the National Agricultural Aviation Association.*

Grant Boyd *is a recent MBA graduate of Wichita State University. A private pilot, Boyd is currently working toward his instrument rating, with the ultimate goal of combining his love of business and aviation with a career at a general aviation manufacturer. You can contact Grant at* **grantboyd2015@gmail.com**

The Worldwide General Aviatio

owner/operators and chief pilots of these air

100%

TOTAL MARKET COVERAGE

Jets – 15,414

Chief Pilots & Owners

Count	Aircraft
55	AIRBUS ACJ319
26	ASTRA 1125
30	ASTRA 1125SP
49	ASTRA 1125SPX
33	BEECHJET 400
226	BEECHJET 400A
117	BOEING BBJ
371	CHALLENGER 300
53	CHALLENGER 600
31	CHALLENGER 601-1A
108	CHALLENGER 601-3A
49	CHALLENGER 601-3R
286	CHALLENGER 604
9	CHALLENGER 800
163	CITATION 500
279	CITATION 525
261	CITATION BRAVO
150	CITATION CJ1
82	CITATION CJ1+
188	CITATION CJ2
170	CITATION CJ2+
364	CITATION CJ3
123	CITATION CJ3+
273	CITATION CJ4
151	CITATION ENCORE
55	CITATION ENCORE+
305	CITATION EXCEL
18	CITATION I
248	CITATION I/SP
437	CITATION II
57	CITATION II/SP
154	CITATION III
86	CITATION LATITUDE
191	CITATION M2
377	CITATION MUSTANG
123	CITATION S/II
256	CITATION SOVEREIGN
76	CITATION SOVEREIGN+
234	CITATION ULTRA
232	CITATION V
27	CITATION VI
97	CITATION VII
249	CITATION X
29	CITATION X+
208	CITATION XLS
229	CITATION XLS+
1	DIAMOND I
38	DIAMOND IA
5	DORNIER ENVOY 3
227	ECLIPSE EA500
59	EMBRAER LEGACY 500
141	EMBRAER LEGACY 600
67	EMBRAER LEGACY 650
221	EMBRAER PHENOM 100
264	EMBRAER PHENOM 300
73	FALCON 10
20	FALCON 100
19	FALCON 200
196	FALCON 2000
22	FALCON 2000EX
56	FALCON 20C
14	FALCON 20C-5
21	FALCON 20D
2	FALCON 20D-5
31	FALCON 20E
9	FALCON 20E-5
65	FALCON 20F
58	FALCON 20F-5
178	FALCON 50
7	FALCON 50-40
93	FALCON 50EX
152	FALCON 900
24	FALCON 900C
104	FALCON 900EX
176	GLOBAL 5000
128	GLOBAL EXPRESS
19	GULFSTREAM G-100
202	GULFSTREAM G-200
9	GULFSTREAM G-300
22	GULFSTREAM G-400
288	GULFSTREAM G-450
8	GULFSTREAM G-500
500	GULFSTREAM G-550
54	GULFSTREAM G-II
21	GULFSTREAM G-IIB
120	GULFSTREAM G-III
165	GULFSTREAM G-IV
283	GULFSTREAM G-IVSP
170	GULFSTREAM G-V
33	HAWKER 1000A
5	HAWKER 125-1A
6	HAWKER 125-1AS
4	HAWKER 125-3A/RA
11	HAWKER 125-400A
13	HAWKER 125-400AS
12	HAWKER 125-400B
9	HAWKER 125-600A
3	HAWKER 125-600AS
95	HAWKER 125-700A
59	HAWKER 4000
184	HAWKER 400XP
34	HAWKER 750
170	HAWKER 800A
33	HAWKER 800B
336	HAWKER 800XP
39	HAWKER 800XPI
83	HAWKER 850XP
158	HAWKER 900XP
6	JET COMMANDER 1121
3	JET COMMANDER 1121B
8	LEARJET 23
15	LEARJET 24
1	LEARJET 24A
11	LEARJET 24B
28	LEARJET 24D
11	LEARJET 24E
7	LEARJET 24F
10	LEARJET 25
35	LEARJET 25B
8	LEARJET 25C
85	LEARJET 25D
4	LEARJET 28
26	LEARJET 31
161	LEARJET 31A
30	LEARJET 35
350	LEARJET 35A
13	LEARJET 36
32	LEARJET 36A
29	LEARJET 40
186	LEARJET 45
166	LEARJET 45XR
92	LEARJET 55
4	LEARJET 55B
12	LEARJET 55C
253	LEARJET 60
108	PREMIER I
6	SABRELINER 40
17	SABRELINER 40A
3	SABRELINER 40EL
1	SABRELINER 40R
21	SABRELINER 60
17	SABRELINER 60ELXM
2	SABRELINER 60EX
58	SABRELINER 65
13	SABRELINER 80
6	SABRELINER 80SC
66	WESTWIND 1
4	WESTWIND 1123
27	WESTWIND 1124
63	WESTWIND 2

Turboprops – 11,605

Chief Pilots & Owners

Count	Aircraft
369	CARAVAN 208
1208	CARAVAN 208B
32	CHEYENNE 400
131	CHEYENNE I
13	CHEYENNE IA
251	CHEYENNE II
56	CHEYENNE III
37	CHEYENNE IIIA
51	CHEYENNE IIXL
23	CHEYENNE IV
176	CONQUEST I

n & Business Aviation Markets

craft *ALL RECEIVE* Twin & Turbine every month

Do you want your marketing message to reach these key decision makers?

It will when you advertise in Twin & Turbine

Count	Aircraft
253	CONQUEST II
42	JETSTREAM 31
57	JETSTREAM 32
60	JETSTREAM 41
25	KING AIR 100
484	KING AIR 200
21	KING AIR 200C
17	KING AIR 200T
197	KING AIR 250
173	KING AIR 300
9	KING AIR 300LW
554	KING AIR 350
64	KING AIR 350C
354	KING AIR 350I
16	KING AIR 90
10	KING AIR A/B90
63	KING AIR A100
209	KING AIR A200
48	KING AIR A90
104	KING AIR A90-1
93	KING AIR B100
854	KING AIR B200
99	KING AIR B200C
8	KING AIR B200CT
91	KING AIR B200GT
4	KING AIR B200SE
21	KING AIR B200T
77	KING AIR B90
329	KING AIR C90
34	KING AIR C90-1
191	KING AIR C90A
351	KING AIR C90B
80	KING AIR C90GT
89	KING AIR C90GTI
150	KING AIR C90GTX
12	KING AIR C90SE
242	KING AIR E90
156	KING AIR F90
25	KING AIR F90-1
61	MITSUBISHI MARQUISE
1	MITSUBISHI MU-2D
22	MITSUBISHI MU-2F
16	MITSUBISHI MU-2J
33	MITSUBISHI MU-2K
10	MITSUBISHI MU-2L
18	MITSUBISHI MU-2M
17	MITSUBISHI MU-2N
24	MITSUBISHI MU-2P
36	MITSUBISHI SOLITAIRE
616	PILATUS PC-12 NG
462	PILATUS PC-12/45
146	PILATUS PC-12/47
215	PIPER JETPROP
68	PIPER M500
79	PIPER M600
794	PIPER MERIDIAN
201	QUEST KODIAK 100
2	ROCKWELL 680T TURBO
5	ROCKWELL 680V TURBO II
5	ROCKWELL 680W TURBO II
4	ROCKWELL 681 HAWK
96	SOCATA TBM-700A
68	SOCATA TBM-700B
283	SOCATA TBM-850
100	SOCATA TBM-900
33	SOCATA TBM910
111	SOCATA TBM930
5	STARSHIP 2000A
68	TURBO COMMANDER 1000
30	TURBO COMMANDER 690
132	TURBO COMMANDER 690A
136	TURBO COMMANDER 690B
81	TURBO COMMANDER 840
24	TURBO COMMANDER 900
52	TURBO COMMANDER 980

Twin Piston – 6,320 Owners

Count	Aircraft
34	BARON 56 TC
1412	BARON 58
2	BARON 58 PA
339	BARON 58P
108	BARON 58TC
3	BARON A56TC
332	BARON G58
186	BEECH DUKE B60
163	CESSNA 340
507	CESSNA 340A
58	CESSNA 402B BUSINESS LINER
130	CESSNA 402C
24	CESSNA 404 TITAN
244	CESSNA 414
352	CESSNA 414A CHANCELLOR
39	CESSNA 421
34	CESSNA 421A
319	CESSNA 421B
596	CESSNA 421C
50	CESSNA T303
110	DIAMOND D42
108	PIPER 601P AEROSTAR
24	PIPER 602P AEROSTAR
515	PIPER CHIEFTAIN
25	PIPER MOJAVE
308	PIPER NAVAJO
208	PIPER SENECA
12	ROCKWELL 520 COMMANDER
4	ROCKWELL 560 COMMANDER
11	ROCKWELL 560A COMMANDER
8	ROCKWELL 560E COMMANDER
7	ROCKWELL 560F COMMANDER
13	ROCKWELL 680 SUPER
3	ROCKWELL 680E
15	ROCKWELL 680F COMMANDER
12	ROCKWELL 680FL GRAND COMMANDER
5	ROCKWELL 680FLP GRAND LINER

High Performance Move-Up Singles – 5,807 Owners

Count	Aircraft
219	BEECH BONANZA
438	CESSNA 182
56	CESSNA 206
389	CESSNA P210N
21	CESSNA P210R
54	CESSNA T182
818	CIRRUS SR20
2991	CIRRUS SR22
28	MOONEY ACCLAIM ULTRA
10	MOONEY OVATION ULTRA
238	PIPER MALIBU
104	PIPER MATRIX
441	PIPER MIRAGE

39,146 TOTAL AIRCRAFT

TWIN & TURBINE

John Shoemaker, Advertising Director
2779 Aero Park Drive • P.O. Box 968 • Traverse City, MI 49685-0968
(800) 773-7798 • (231) 946-3712 • Fax: (231) 946-9588
E-mail: johns@villagepress.com • www.twinandturbine.com

Five on the Fly

by **Grant Boyd**

PHOTOS COURTESY OF AIR TRACTOR

WHO:
Andrew Moore

COMPANY:
National Agricultural Aviation Association

POSITION:
CEO

1. Why is agricultural aviation important to everyone, including those who don't live on a farm or have interests in agriculture?

Each year, 127 million acres of cropland are treated aerially, or 28 percent of the total cropland acres. This includes corn used for food and ethanol, cotton used for clothing, and rice, soybeans, fruits, vegetables, grains, etc. used for food. Aerial application also treats range and pastureland to feed livestock used for consumers' dairy and meat consumption. Whether it is conventional cropland or cropland grown organically, aircraft are used to apply seeds to start crops, nutrients to feed crops and pesticides to protect crops until harvest. The industry also provides firefighting and public health application services to combat disease-carrying mosquitoes and other health-threatening pests.

2. How is the industry working together to minimize risk within the agricultural flying environment?

Similar to all of aviation – general, commercial or military – safety is paramount for ag aviators. Flying ag introduces more risk into the flying equation due to making applications at just 10 feet above the crop canopy typically at speeds above 100 mph. Flying at this altitude means flying below obstacles such as utility poles with accompanying wires and communication and meteorological evaluation towers. Many of these towers are unmarked. From 2008 to 2018, there were 22 agricultural aviation accidents from collisions with METs, communication towers, towers supporting powerlines and wind turbines, resulting in nine fatalities.

For all of general aviation, there have been 40 tower-related accidents and incidents resulting in 36 fatalities over the same 11-year period. As

a result of these accidents, NAAA won a hard-fought victory in seeing federal legislation signed into law in 2018 requiring rural towers between 50 and 200 feet tall and 10 feet in diameter be marked and logged into an FAA database accessible to aerial applicators. Prior to this legislation being passed, only towers above 200 feet were required to be marked.

To address other aviation safety, security and environmental professionalism issues, NAAA developed its annual PAASS (Professional Aerial Applicators' Support System) program, an annual training program offered to all U.S. aerial applicators. The PAASS program hit the stage back in 1998 and produces new educational material every year on safety, security and environmental stewardship. In that time, the PAASS program has successfully reduced agricultural aviation accidents by almost 25 percent.

3. How has the industry shifted in terms of aircraft?

The ag aviation industry has primarily transitioned to turbine engines (81 percent of the total fleet) from piston engines. Turbine powered aircraft are popular because of their greater efficiency, reliability and power. It has resulted in larger and faster ag aircraft being developed. This translates to more acres treated, but also a decrease in the number of aircraft in the industry's fleet and the population of ag pilots. Today there are approximately 2.3 aircraft per agricultural aviation operation or a total of 3,588 aircraft nationwide. According to the 1962 FAA Publication "Aircraft in Agriculture," there were 5,075 aircraft in the U.S.

The largest ag aircraft the same year were the Snow S-2 and the Ag Cat, each with maximum hopper capacities of about 300 gallons. Today, with turbine equipped aircraft, the average-sized plane is over 500 gallons with 600-, 700- and 800-gallon hopper-equipped aircraft quite common. Air Tractor is currently working on FAA certification of an aircraft with a hopper capacity of 1,200 gallons.

GPS, in addition to diversifying the industry to make variable/precision applications and create aerial images, has also decreased the number of crew members needed to make aerial applications and made it safer occupationally. GPS did away with the human flagger – a field worker that would use flags at the beginning of the application point in the field for the ag pilot to see to line up each swath.

4. What do you see as the future of agricultural aviation?

The future looks promising for the aerial application industry. The current U.S. population is 328 million people, which is expected to grow to 438 million by 2050, according to the Pew Research Center. Globally and domestically, that is a lot more mouths to feed, bodies to clothe and biofuel to power a growing population's needs – all of which our farmers produce and aerial applicators treat, fertilize and seed. Aerial applicators will also continue to diversify. They will photograph and utilize more aerial-digital images to make precision/variable rate applications as agricultural sustainability continues to grow.

5. How is the industry attracting new pilots?

There are several ways in which the NAAA is working to attract pilots to the agricultural aviation industry. We have a great section on our website, *www.agaviation.org,* about learning about ag aviation careers. There are also several flight schools that focus solely on ag aviation. We provide programs at our annual convention and state and regional aviation associations that answer questions posed by potential ag pilots about how to get involved in the industry. Our convention, as well as Oshkosh, is also a great place for ag pilots looking for work to network with operators hiring and vice versa. Ag pilots like the good pay and the seasonal work offered by flying in the aerial application industry because it allows them downtime to travel or take different jobs in the winter off-season months. T&T

Pilot Tube

CitationMax: Flying Viewers into the Citation Jet Age

by **Dale Smith**

Max Weldon, Citation CJ3+

If you've ever wondered how a 25-year-old guy can go from earning his PPL at 18 to becoming an ATP-rated, professional pilot in the left seat of a brand-new Cessna CJ3+ in only seven years, you need to tune into the CitationMax YouTube channel.

It's a pretty easy assumption that when people first meet Max Weldon, they're possibly pleasantly surprised by his maturity, politeness and humble demeanor. Oh yeah, and there's also the fact that he's an ATP-rated, professional pilot flying a new Citation CJ3+ for his father's business.

Before you jump to any conclusions, being his father's son didn't guarantee Max a "golden ticket" to the CJ's left seat. Mr. and Mrs. Weldon didn't raise their children to expect things to be handed to them. No, like they said in the old Smith Barney commercials, "He earned it."

That he did, and Max is justifiably proud of what he's accomplished. And you would be too. It takes a huge amount of time, determination and dedication to go from zero flight time to an ATP with 2,000 total hours – over 700 of which are in Citations – in just seven years.

Sure, like most parents, his mother and father have been very supportive of his dream. But when he started his airborne adventure, he had no idea he'd end up where he is. In fact, until he landed his first job as a professional pilot, owning a private airplane was something his family had never considered. But, before we get too far ahead, let's go back to where it all started.

True Love Never Dies

"I grew up in England, and my father was away a lot on business. When I was four, my mom says I'd sit in our garden and watch the planes landing at Heathrow. I'd shout 'Papa' every time one flew over," Max says. "Airplanes became my dad's and my thing. We'd talk about airplanes all the time. He'd tell me about all the ones he flew on and ones he saw."

"On my eighth birthday, I spent all of my gift money on Microsoft Flight Simulator 2004. I don't know how many hours I spent in my room imagining I was flying the world," he said. "As much as I loved it, I never thought I would become a pilot. It wasn't that I didn't long to, but for some reason, maybe lack of confidence, felt that it was out of my reach. But I sure wanted to try."

The Weldons returned to the United States in time for Max to attend high school, and more importantly, convince his mother to let him take flying lessons.

"I had been pestering my mom to let me take lessons. She wasn't comfortable with any of the Cessnas or Pipers she saw," he says. "But I was determined and found a flight school in White Plains with a fleet of new Cirrus SR20s. The parachute did the trick."

"I soloed on September 18, 2015 – I have the shirt on my wall," Max continued. "I earned my PPL (Private Pilot's License) and, like that, just hit a wall. I was so wiped out by all the studying and flying, trying to be really great, I just got burnt out. I honestly didn't know if I'd ever fly again."

"It took me about six months to get my head around it and realize I wasn't going to settle for being a weekend pilot – not that there's anything wrong with that – but it wasn't enough for me," he added. "I loved flying. I had to figure out a balance and a way to move forward."

One thing that was on his side, which he's very thankful for, is that his original flight instructor had become his friend and aviation mentor.

"He has always been very important in my aviation career. I wanted to be perfect. He taught me what it was to be a professional," Max says. "He helped me over the hump, and that help has transformed from a private pilot into someone who can make professional aviation his career."

A Career is Born

After earning all the required ratings, Max's first break came when the Part 91 aircraft management company connected to the Cirrus Training Center hired him to be one of their contract pilots flying Cirrus owners around.

"I was 20 and had 250 hours in my logbook, but the operators knew and trusted me," Max says. "It was a career-defining opportunity. Along with flight experience, I also learned firsthand what it meant to be a 'professional' pilot and being responsible for passengers and their needs."

While that was indeed a break for young Max's career, he says the true turning point was when he was offered the right seat for a flight in a Citation.

"It was a client-owned CJ, and they wanted a co-pilot to help with the radios and all. I didn't need a type rating," he explained. "The Captain was fantastic. He was professional as they come. He's the kind of pilot I strive to be."

While the flight to Cincinnati was educational, the real lesson came after they landed. As their lone passenger deplaned, he leaned in the cockpit and said that he had clogged the aircraft's flushing toilet.

"The FBO wanted $800 to fix it, so we went to the store and bought all the stuff to clean it. When we got back to the plane, the Captain handed me the blue gloves and said, 'Welcome to the glamorous world of corporate aviation,'" Max says. "I wasn't raised to back away from a commitment. Even though I wasn't getting paid, when I accept any job, I finish it. So, I put the blue gloves on and dove in…"

Max Earns His Stripes

After 18 months of hearing Max talk about all of the people using single-engine airplanes for business, his dad decided to buy one of the first Cirrus SF50 Vision Jets.

"My father likes to be a maverick of sorts and was fascinated to learn that Cirrus was manufacturing a personal jet that had a parachute. He decided it could make sense to have his own, professional-flown Vision Jet for domestic travel," Max said. "This was a huge step for my dad. He flew in Coach until he was 50 – he's just not that kind of guy. He knew other people who had airplanes, but he never understood the value they delivered until he got one."

Max explained that after attending Cirrus training for the new jet, they flew it for about six months traveling all over the U.S. for business.

"It was on a longer leg when my dad decided he needed something bigger and with more range," Max said. "So, after looking at the available models, the decision was made to upgrade to the Citation M2. The management company was hugely pro-Cessna, and my dad liked that it was an American-owned company."

While Max had already amassed quite a bit of experience flying the various Cirrus aircraft and Citations for the management company, his aha moment as a professional pilot came when he went to FlightSafety in Wichita for his CE525 type rating with the "S" (Single-Pilot) endorsement.

"We have always flown as a professional operation, but FlightSafety really made me a much better pilot. I learned so much in those three weeks. I left with all the confidence and knowledge I needed to fly the M2 safely," he said.

Speaking of professional pilot operations, Max stressed the fact that although he and the M2 (and subsequent CJ3+) are single-pilot qualified, whenever his dad is on the airplane, every flight is made with another professional pilot in the right seat.

"In fact, my preference is always flying as a crew with another experienced pilot," he says. "When I do fly

single-pilot, I work closely with our aircraft manager who provides complete oversight through a regimented pre-departure process, which is spelled out in our safety manual."

He also shared the story behind N-number, N2RF. Reggie and Figo are the names of the family's beloved dogs, and his mom wanted to honor their memories by christening the Citation in their memory.

"My mom is a true animal lover, and she says that whenever we're flying, Reggie and Figo know we are up there close to them," he says. "It makes us all very happy."

"When my dad is not using the airplane for business, my mom (CitationMom) flies with me in support of her animal rescue efforts," Max said proudly. "She has an animal sanctuary in Jackson Hole, Wyoming. She also does a lot of work with dog rescue groups in the Mississippi Delta Region."

New Airplane – Same N-Number

While the Citation M2 was a huge upgrade from the Cirrus Vision Jet, it falls short in one key ability: range. Max explained that his father's business requires that he make frequent trips to Bermuda. The M2 can't get there from here.

"After only six months and 250 hours of flying the M2, we upgraded to a new Citation CJ3+. It's really the airplane we should have gotten in the first place," Max says. "The CJ3+ is a fantastic airplane. It's fast. It climbs like a rocket. And, most importantly, it fits my dad's mission precisely. He's a numbers guy, and the CJ3+ just adds up to be everything we need."

Fly Along with Max

"I started my YouTube channel when I began taking flying lessons. I used to go back and watch the videos to learn from my mistakes. It was one camera with no editing," Max stated. "It evolved to be better and when I started flying the Vision Jet, I renamed the channel CirrusMax. Then when we got the M2, it became CitationMax."

"Flying is my life, and I love sharing my experiences with all of my subscribers. I try to give them the feeling of what it's like to be in the right seat of a professionally-flown CJ. Even when the right seat is taken, I want to verbalize everything I do so they feel like my co-pilot," he explained. "I also want every 16-year-old kid who watches me know that if they have a dream, they can work towards it."

"I had obstacles, and yes, I had help," Max continued. "But I believe that if you start to work towards your dream, people will help you. If you work hard enough, you will find your own breaks – it's possible. Maybe it's not flying, but whatever it is, you can do it. My YouTube channel gives me that connection." T&T

Dale Smith *has been a commercial, private and business aviation marketing and media communications specialist for nearly 40 years. He is an award-winning aviation journalist and aviation artist. Dale has been a licensed pilot since 1974 and has flown more than 40 different types of aircraft. Contact Dale at* **dalesmith206@comcast.net.**

Owner Spotlight

How a Water Guy Takes to Air

by **Nicholas Guida**

J. Wickham "Wick" Zimmerman has been flying for more than 30 years. His childhood dream was to get his pilot's license and move to the beach to fly a banner plane up and down the shore all day advertising drink specials and beer. Unfortunately, that dream got put on hold when he realized the costs involved with getting your license and having a plane.

Fortunately for Wick, a successful career as a structural engineer in the construction business has allowed him to realize his dream of getting his license and owning a plane. He eventually started his own company, Outside the Lines, which designs and builds water features, rockwork and themed environments for entertainment spaces, including retail

entertainment, zoos, aquariums, resorts, museums and corporate venues. Many of his clients and job sites are not close to major airports, which was a core reason behind getting a plane. Travel time is shortened by private flying, with more time for face-to-face meetings to discuss and view plans and models.

Getting started as a pilot had more challenges than just money. Wick claims his first flight instructor tried to fire him a few times. He started his training at Hayesfield in Ellicott City, Maryland (which has since closed). The instructor was incredibly knowledgeable and patient, but originally only wanted to do one lesson per week. Wick was more interested in getting his license as quickly as possible and didn't want bad weather on his "one day" to throw him even farther behind. He also wanted to learn how to fly and not just learn what he needed to know to pass a test, and he felt this instructor was the best person to help him do that. Finally, they negotiated a schedule that worked for both of them and Wick got his license in about a year.

Wick bought his first plane, a Beechcraft Bonanza A36, shortly after getting his license. He flew the Bonanza for about 12 years before moving up to a twin-engine Beechcraft Baron. His appreciation for the quality of Beechcraft planes started with a Beechcraft V-tail at the airfield where he learned to fly. Ultimately the A36 won him over because compared to the V-tail it has a little more room and a better center of gravity (CG) envelope, which gave Wick more flexibility when loading the plane.

His current plane, a Cessna Citation CJ1 (CE-525), is his first Cessna and his first jet. As you would expect from an engineer, Wick did a lot of research before buying the plane and ultimately settled on the CJ1 primarily due to the quality of construction, longevity of the model's production, and because it was certified for single-pilot operation. He was impressed that the 525 was designed to Part 25 standards, which are the standards used for transport category airplanes.

J. Wickham Zimmerman and his wife Allison with their Citation CJ1.

He and his wife, Allison, have been flying their CJ1 for about six years.

On average, the Zimmermans fly between 150 to 200 hours per year, though they are expecting a slightly busier year this year. Most of those flights are for business. Their company is headquartered in Anaheim, California, with an office in Dallas, so they do many flights between the two cities. They also travel to Boise and Salt Lake City regularly and make a trip to the East Coast every few months for work and family visits. Working on up to 20 projects or more at a time like Wick's team does means efficiency is so important.

Wick's engineering background and track record of problem-solving for his clients fit well with his pilot sensibilities. The math and science that go into constructing a functioning fountain that shoots water 150 feet into the air and is choreographed to music follow the same rules involved in the aerodynamics of flight – movement, gravity and resistance. That is combined with the beauty of the final product, whether it is a spectacular light and water show or a natural-looking home for a family of penguins. It is easy to compare that creative vision to the majestic beauty you see looking out of an airplane as you come over a mountain or watch the sunset from the sky.

While Wick is the official pilot, he is encouraging Allison to consider getting her license. She took a brief course at last year's Citation Jet Pilot (CJP) Convention and is considering more lessons. However, Wick said there is a big benefit to having her on the radio – the controllers always like her better and are generally nicer.

In August of 2019, Wick said they made a change to their CJ1 that has had a big impact on their flights: they added Tamarack Aerospace's Active Winglets. He was familiar with the science behind winglets and had flown a Beechcraft Duke and King Air with passive winglets, though ultimately didn't buy those planes. He liked that the Active Winglets didn't require any structural modifications. The fuel savings he has seen has been most apparent on his frequent trips to Dallas. Typically, they use 150 lbs less fuel each way to make the trip. And while they could typically make the trip from California to Dallas without stopping, on the return flight, it was always a 50/50 chance of whether they would have to refuel because of the headwinds. Because

the Active Winglets give the plane a significantly better climb rate, they get to a higher altitude faster and burn less fuel. This means they can do the return flight without stopping unless there are dramatic headwinds. Before they were limited to doing three-hour flights with appropriate reserves and now a four-hour flight is no issue. They can also complete East Coast to West Coast trips with one fuel stop instead of two.

While having fewer stops is a benefit for everyone, it is particularly important when you are carrying valuable cargo like a rescue animal. Wick and Allison work with volunteer groups Pilots N Paws and Doobert to help transfer rescue animals to new homes. Their passengers have included a 133-pound Mastiff, a pair of wolf dogs and an elderly pit bull mix. Wick said it seems like the animals can sense they are on their "freedom missions" to a better life. Though, it is still helpful to have a bag full of hot dog pieces to keep a Mastiff occupied and out of the co-pilot seat.

Wick said what he loves most about flying is the ultimate sensation of freedom. "Even though we fly in a very regulated and controlled world, there is nothing like it that I have experienced," he explained. "The convenience of flying one's self is certainly a close runner-up." T&T

Nicholas Guida *is a pilot and aerospace engineer with over 30 years of experience in the development of certified aerospace products. He is the Founder and CEO of Tamarack Aerospace. You can contact Nicholas at* **sales@tamarackaero.com.**

by **Kevin R. Dingman**

To Err is Human

...Unless You're a Pilot

err/er,ər/
verb
be mistaken or incorrect; to make a mistake

"We got your prime pilots that get all the hot planes, and we got your pudknockers who dream of getting the hot planes…see, some peckerwood's gotta get the thing up and some peckerwood has gotta land the son of a bitch. And that peckerwood is called 'a pilot.'"

–Pancho Barnes, "The Right Stuff"

According to The Oracle of The Happy Bottom Riding Club, we are either pudknockers or prime pilots and all of us that take off and land airplanes are peckerwoods. But are pilots human? Of course we are, but after 100-plus years of manned flight, in the eyes of most people that are not pilots, the mystique of flying remains exciting, dangerous, difficult, romantic and sometimes a bit superhuman. And they expect all of us pudknockers and prime pilots alike to be error-free. When I was a silver-reflective-sunglass-wearing teenage private pilot (wow, that's a mouthful), I had a T-shirt that said: "To Err is Human; To Forgive is Out of The Question." The term for making a mistake in baseball is an "unforced error." And I made one in MIA, felt like a pudknocker, and I'm having trouble forgiving myself.

Head Games

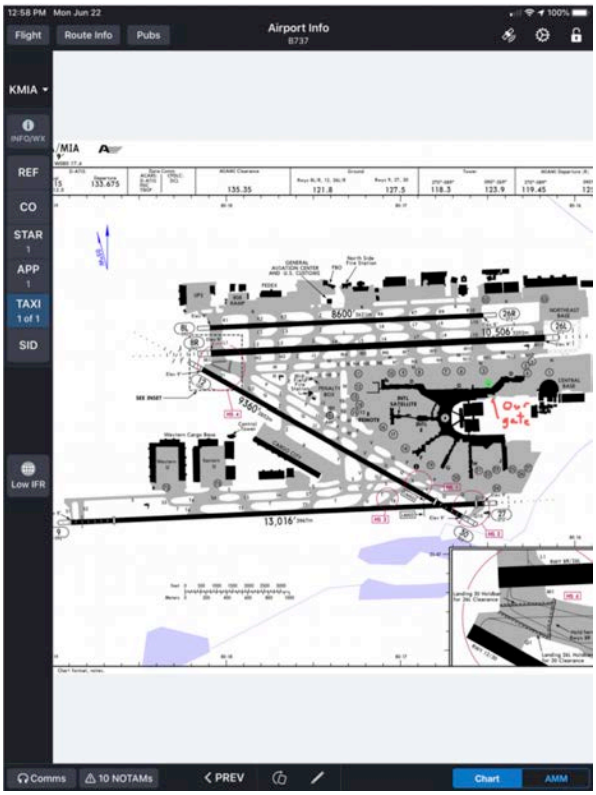
Other than the cost of learning to fly, the aforementioned exciting, superhuman mystique is likely the reason most pilot wannabes continue to be wannabes. And why some who become pilots are reluctant to learn to fly more complex machines or in more challenging environments. No one wants to feel like a pudknocker by meandering too far from their comfort zone. It's that mentality that kept me from becoming a professional baseball pitcher, applying to the USAF Academy and dissuaded me from any type of engineering profession because those folks are more disciplined, more talented, smarter and able to learn much easier than me.

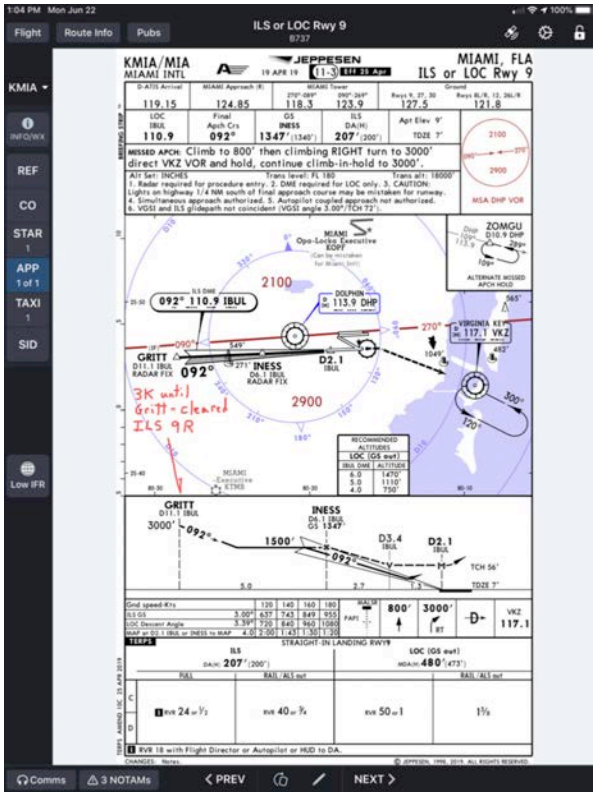
So, how did I get past that mentality to become a steely-eyed fighter pilot, airline captain and brilliant writer? I forced myself to become disciplined and focused, which eventually gave me skill (if not talent). And by working longer and harder than my peers (I know, everyone says that), I slowly learned to fly airplanes and write magazine articles. And even though flying an F-16 gave me FPAS (Fighter Pilot Arrogance Syndrome), my occasional unforced errors in piloting nowadays are an effective therapy in correcting this annoying personality flaw – mostly.

Perceptions

Over the years, the public has grown to believe that the superhuman part of piloting is only needed for the first and last ten minutes of a flight. Ask most travelers how we are able to fly from A to B while in the rain, snow and gloom of night from lift-off to touch down, and they will say that ATC, radar, GPS and autopilots are making all of the brilliant maneuvers and flawless approaches. Unmanned drones are not helping with this mindset. If it was a bumpy flight, if it takes longer than planned, or if we make a bad landing, then we must not have listened to ATC, we turned off the autopilot or we are simply ham-fisted pudknockers. With our modesty in check, we can do our best to clarify this perception and promote the piloting profession.

When I make a PA to the pax about the ride ahead, I always say that pilots above, below or out in front of us are saying it will be smooth or bumpy. Yes, we get that information from ATC and I'm grateful, but they got it from a pilot, not radar, GPS, an autopilot or their ride-forecasting Ouija board – they got it from a pilot. Whenever a passenger gives us a compliment on the trip, in-flight PAs or the landing, I'm grateful and contrite (FPAS notwithstanding) as I smile through





my COVID mask, nod and say thank you. And when the FO flew the leg, I always say it was the copilot's leg and landing, not the first officer but the copilot. I want for them to hear the pilot word. But on this day in MIA, I was disappointed in myself as a pilot not only because it was my error that created the need to go-around, but I lied to my passengers about the reason I did it. Here's the truth.

Arrogance Syndrome Rehabilitation

There I was, in my painted 737 (as opposed to a shiny MD-80). It was a one-leg day, ORD to MIA, in daylight, decent weather, with a 24-hour layover in a COVID-ruled hotel with a COVID-ruled, but delicious, seafood restaurant next door. The trip signed in at 0415 for a 0515 departure so we were finished and in our hotel rooms by 1000. My FO and I hadn't flown together yet on the 737 but had been paired together a handful of times in the Mad Dog. Except for the 0245 alarm clock, it's an easy peasy trip – not hours of boredom punctuated by moments of terror. The two-hour flight was, however, punctuated with the MIA-typical runway selection/change ritual in the last few minutes. I had done this trip four or five times in the previous couple of months and since our gates are on the north side of the terminal, we had repeatedly been assigned one of the north-side runways: 8R ILS or 8L RNAV GPS, all from the SSCOT-5 RNAV arrival.

Knowing this in the descent, I loaded and briefed the 8L RNAV GPS because it's easier to switch to the ILS from the RNAV than to switch to the RNAV from the ILS. But this time we got the ILS to 9R – no big deal. The process of flying an approach includes loading the FMS, tuning and identifying the NAV radios, setting the radar and baro. altimeter mins, then briefing the approach to the other pilot. We have acronyms to help remember the process, including the FMS steps: "check-plus-two" covers the FMS and setting up the HUD. A semi-optional step is to use the fix-page to put a 2-mile ring around the FAF/glide path intercept point. This gives us a heads up to intercept the descent path and finish getting configured.

I forgot this step. The 2-mile ring step, not the get configured step, and it bit me in my lazy hinny. Not because I skipped it, but because I tried to complete the step instead of a more important step, which was pushing the GS capture button. I instead created the 2-mile ring around INESS. We were level at 3,000 feet, in the weather at GRITT, and by the time I finished creating the ring and armed the GS capture mode, we were past the descent path and too far above the glide slope to salvage a stable approach. After we went around, I told my passengers that we were too close to the aircraft landing in front of us. I lied – what a pudknocker.

At Home in the Sky

> A well-adjusted person is one who makes the same mistake twice without getting nervous.
> – Alexander Hamilton

I'm coming up on 30,000 hours in the sky: 2,000 military, 2,000 in the Guppy, 18,000 in the Mad Dog and the rest in GA. Comfortable and confident describes how accustomed I am to being in an airplane. Oftentimes my biggest threat of the day is not overconfidence but being complacent – lazy. Like when you think to

yourself that it feels as if the car knows its own way to the office. I've got to stay more focused and maybe stop going to Florida. The battery in my C-150 overheated near TPA; I had a near mid-air between my Cherokee and two F-4s in South Florida; I had to jettison some malfunctioning, inert F-16 ordnance off the coast of MIA; and I sucked a bird down the intake between MIA and the Avon Park bombing range. The right engine of my MD-80 blew up at gear retraction in MIA (see "Issues," T&T September 2010), and I allowed my FO to bust an altitude on approach into MIA. Now I've committed an unforced error by forgetting to arm the GS mode which dictated a go-around – also in MIA. I'm seeing a sunshine state trend. We were still 20 minutes early at the gate, but I was disappointed in myself for the mistake and the lie.

The Spirit of Pancho Barnes

The malfunctioning 500-pound Mark-82 bombs and the MD-80 engine failure were not my fault, nor was the C-150 battery malfunction, the near-midair nor the bird-sucking event. And a go-around for any reason is not a mistake. But the ILS switch error made me feel like a student pilot and not at all superhuman – like an unfocused, let-the-car-find-its-own-way pudknocker. To err is human indeed, but I didn't like the smirk that I imagined on Pancho's face as she shook her head and called me a (expletive) pudknocker.

But I've learned that a stable approach ranks right up there with not stalling the airplane, not hitting anything with the airplane and not running the airplane out of gas. Flying a stable approach is one of the most important things that we do. Many of us are just now getting back into the saddle after the COVID lockdown, and we're once again flying in some serious rain, snow and gloom of night – OK, maybe not snow yet. Stay focused and stay ahead of the airplane, my fellow peckerwoods. The spirit of Pancho Barnes is watching. T&T

Author's Note: *Since mid-June when I wrote this article, I've added another reason to avoid Florida. It looks like the positive COVID test I received on June 29 was a result of time in MIA. Mine was a "relatively" mild case (102.9 temp, lost 15 pounds in 7 days, no smell or taste, flu-like pains and quarantined/off work for three weeks) but even still – I strongly recommend following CDC guidelines. And yes, I was wearing a mask constantly except when in the cockpit.*

Kevin Dingman *has been flying for more than 40 years. He's an ATP typed in the B737 and DC9 with 24,000 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 organiz tion Wings of Mercy, is employed by a major airline, and owns and operates a Beechcraft Duke.Contact Kevin at* **dinger10d@gmail.com**.

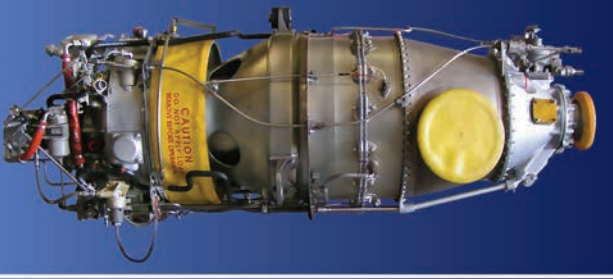
TURBINES INC.

PRATT & WHITNEY PT6A

FLAT RATE OVERHAUL

NO B.S. - NO BUREAUCRACY

ENGINE	BASIC	CAPPED PRICE
PT6A-11 / -21	$ 169,000	$ 240,000
PT6A-27/ -28	$ 180,000	$ 245,000
PT6A-34 / 34AG	$ 190,000	$ 255,000
PT6A-112	$ 169,000	$ 225,000



Engine must be a normal time expired core with no missing parts. Basic price includes accessory overhaul. Basic price does not include CT Blades or 1st Stage Reduction Gears. Replacement parts may be new PWC, overhauled PWC or PMA. Pricing does not include life limited parts, freight, insurance or taxes.

MASTER ENGINE BUILDERS PT6 & OVERHAULERS

812.877.2587
turbines@turbinesinc.com
/turbinesinc
youtube.turbinesinc.com
linkedin.com/company/-turbinesinc/

TSO High Altitude
FAA Approved Mask

with
comfort fit
headgear

Carbon Fiber Diluter
Demand Mask

aerox®
Phone (800) 237-6902
www.aerox.com

Ad Index

ADVERTISING DIRECTOR, JOHN SHOEMAKER • 2779 Aero Park Drive, Traverse City, MI 49686
Phone: 1-800-773-7798 Fax: (231) 946-9588 • E-mail: johns@villagepress.com

TWIN & TURBINE
ONLINE!
View the entire magazine on the site!

Viewable on
any device!

- Current Issue
- Issue Archive (2015)
- Purchase Back Issues
- Page Turn Version
- Comment on Articles
- Advertiser Spotlight
- Advertiser Links
- Feature your plane
- Special Jet Journal Section
- Contact Us

www.twinandturbine.com

COMBAT WOUNDED
THEY'VE GOT HEART, THEY NEED WINGS

Imagine returning home from combat facing devastating injuries
and long-term hospitalization-- in a facility hundreds of miles away from your family.

Imagine somebody brings you together.

The VAC provides free air transportation to wounded veterans and their families for medical and other compassionate purposes through a national network of volunteer aircraft owners and pilots.

FIND OUT HOW YOU CAN MAKE A DIFFERENCE.

VeteransAirlift.org

952-582-2911

How Much Stress is Enough?

"I will have to shut down the GPU for a few minutes," yelled the line guy on the Signature ramp. Darkness and heavy mist hung in the early morning at Dallas Love Field (KDAL). "Why?" I responded. "We just detected a lightning strike west of the airport and everything has to shut down," he replied.

Just a little more stress to start the day.

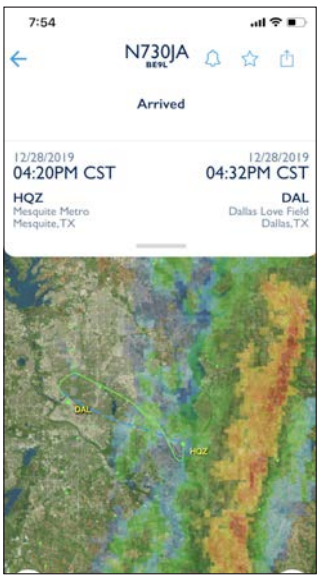
Only 24 hours before, I received a phone call that a favorite relative had passed, and today I was flying a planeload of family members to a funeral.

"Dallas Love Field information Alpha, wind one four zero at one two, gusting two three, visibility two and one half, light rain, thunderstorm, fog, overcast six hundred, temperature one two, dewpoint one zero, altimeter two niner eight four, simultaneous ILS approaches runway one three left, runway one three right in progress."

Are you beginning to see the picture?

Prior to the flight, I ran my mental risk assessment and decided to call Jason, a multi-thousand-hour King Air instructor, to help in the right seat. We were headed to Jackson, Mississippi, and a line of weather was forecast to pass through Dallas about the time of our return.

Jason handled the passenger safety briefing as I set up the cockpit. On departure we were immediately enveloped in IMC and light rain and turbulence. Jason worked the radios while I cycled the boots in light icing between 14,000 to 16,000 feet. With a 40-knot tailwind, we landed an hour and fifteen minutes later after shooting the GPS Runway 16 to Hawkins field (KHKS). Five of us scurried to the rental car while Jason tended to the engine covers and checked the oil.



On the drive to the funeral home, Patty's phone rang. On the other end was the nurse at the retirement home where her mother lives. "Your mom has fallen, and we need to know if you want us to take her to the hospital for a CT scan," came the request.

Another little addition to the stress quotient.

From the backseat, my son Matt asked me about a Piper Cheyenne that crashed on takeoff in Louisiana as we flew overhead. My family had more questions.

Just a tad more stress.

During the funeral, the line of thunderstorms west of Dallas continued its eastward crawl. I glanced at my iPhone radar picture only once, knowing that Jason was watching closely at the airport.

Just a tad more stress.

After the service, Jason and I huddle at the FBO and decide that we can head back towards DAL and land short if necessary, to wait out the line of weather.

In between layers at FL 200, Center says, "November seven three zero Juliet Alpha, regional approach says they are no longer taking arrivals from the southeast. We can take you all the way west and back to Love or you can divert and wait out the line of thunderstorms."

Jason and I discuss the options. "Can we proceed as far as Mesquite (KHQZ) 20 miles short of our destination?" I ask. "Standby" comes the response. Then, "Approach says they will agree to that."

We head for Mesquite, the C90 now fully enveloped in the turbulence and clouds, where the weather is 600 overcast in 2 miles visibility with crosswinds gusting to 24 knots. I cycle the boots and activate all the deice equipment. "Jason, you have the airplane," I said. This gives me the time to fully brief the puzzled passengers and answer a couple of their questions, knowing that Jason has control of the airplane.

We land on a wet runway and file a flight plan to KDAL 30 minutes later, landing in light rain. Jason puts the covers on the airplane, and I clean the cabin, while Patty heads to see her mother.

It was really nice to have another set of eyes and hands in the right seat. Sometimes it's not about how you fly the airplane, but how you manage the flight.

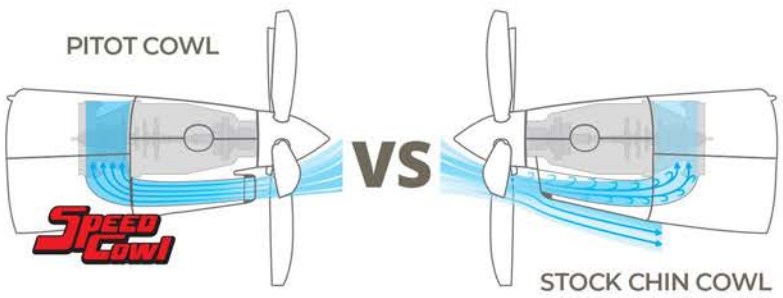
Fly safe.

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**.

UNLEASH THE POWER OF YOUR PC-12

COWL INTAKE DESIGN

Internal Aerodynamic Design is a key factor in achieving optimal engine performance. The stock Pilatus cowl is referred to as a chin cowl. In general, chin cowls are not efficient due to the turbulent air they develop which reduces the airflow (ram air recovery) to the engine. The design of Speed Cowl is referred to as a pitot cowl. Like a pitot tube, the inlet is positioned lower and forward to capture uninterrupted airflow. Speed Cowl provides increased ram air recovery to the engine which equates to better engine performance.



HEATED INLET LIP DESIGN

Take a look at the left side of the stainless steel inlet lip on your PC-12. You will undoubtedly see discoloration on the lip due to excessive heat. There is roughly +800° F exhaust entering the lip at that point. The heated air moves to the right side of the lip where it exits at about 350° F. Over time the carbon fiber and paint start to deteriorate, especially on the left side of the lip. As all PC-12s age, heat damage to the carbon fiber and paint is inevitable. Speed Cowl's patent-pending heated stainless steel inlet lip features internal baffling reducing the temperature of the exhaust entering the lip and maintains a more even temperature of the heated air as it moves through the lip. This design will reduce the possibility of heat damage to the carbon fiber and paint over time.

Keep a look out for more Speed Cowl benefits.
In the meantime, if you have any questions email:
sales@edmo.com

Manufactured by AMERICAN AVIATION INC. | *Distributed by EDMO Distributors, Inc.*

info.edmo.com/speedcowl

GIVE YOUR LEGACY PANEL NEW LIFE

Avidyne's FMS/LPV with ADS-B upgrade solution provides more features, increased capabilities, and a reliable performance proven by even the most experienced pilots. Upgrade your legacy flight deck in days not weeks saving you on downtime and installation costs.

Compatible with most legacy EFIS systems including Primus 1000 and Pro Line 21™.

CERTIFED, IN STOCK & READY TO SHIP!*

Visit **Avidyne.com/business-aviation** for a list of Authorized Certified Dealers.

See Avidyne's FMS/LPV upgrade solution in action **Avidyne.com/videos**.

* CITATION 500 SERIES, KING AIR AIRCRAFT

Call: **800.AVIDYNE (284.3963)**
Email: **sales@avidyne.com**
Visit: **avidyne.com/business-aviation**

AVIDYNE®