

Flight Levels

MAGAZINE

For owners and operators of Twin Commander Aircraft



Geoffrey Pence, Longtime Twin Commander Technical Service Manager, Flies West

There's a common refrain when you speak to friends and associates of Geoffrey Pence, Twin Commander's long-serving technical service manager. He was universally liked, respected, and admired. After a long career helping others solve issues and serving customers, Pence was best known as honest, straightforward and, most of all, a genuinely nice guy.

Soft-spoken, he possessed a sharp wit and ironic sense of humor. Pence retired from Twin Commander earlier this year, capping off 21 years with the company. Before that he worked at Aero Air, a Twin Commander Factory Authorized Service Center, and Gulfstream when it was producing Commanders.

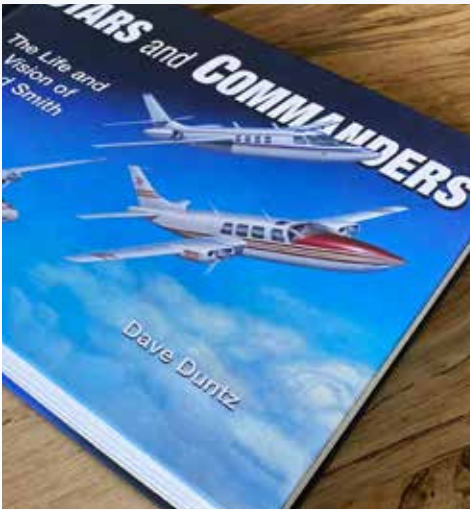
Jim Matheson, the former owner of Twin Commander Aircraft, hired Pence. "Geoffrey was a big part of how we turned around the company," he said. "Hiring him was the best thing I ever did." Previous to Matheson, Twin Commander Aircraft had not fully understood all of the implications of owning an aircraft type certificate, in particular the need to provide a full range of

support services for owners and service centers. Matheson knew that far from just selling parts, the type certificate holder needed to instill confidence and trust in the product. Matheson said that Pence, "gave Twin Commander the credibility that it needed to work with the service centers."

Working with the Factory Authorized Service Centers

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New Book Offers Complete History of Twin Commanders Q&A with Dave Duntz



Author Dave Duntz has given the Twin Commander world a gift. He has published a new, authoritative history of the full Commander line, starting with the prototype and moving through to the Jet Commander. *Stars and Commanders: The Life and Vision of Ted Smith* is an engaging combination of Duntz's research, historic photos, first-hand accounts, and lengthy excerpts of Smith's own words from his unpublished memoirs. *Flight Levels* interviewed Duntz to get a sense of why he wrote the book, what he learned during his research,

and what makes the Commanders such revolutionary aircraft.

You can purchase a copy of the book at www.starsandcommanders.com.

Q: What's your aviation background?

A: I've always had an interest in aviation. My dad had a J-3 Cub, so I started flying with him at a very early age in the back seat. I soloed in the summer after my senior year in high school and got my private

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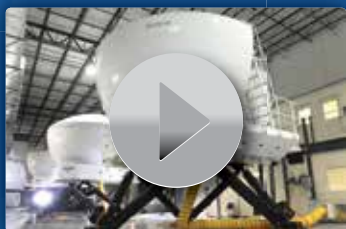
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Taking Our Temperature

By Brian Harbaugh

Temperature testing is becoming a trend. Some buildings require you to lean forward while they point the laser at your head, other places work on the honor system and ask if you have a high temperature. Soon airports and public gathering areas will have automated temperature systems to screen high fevers – all as part of our new normal.

At Twin Commander we are taking temperatures as well. Recognizing that the safety of our workforce is primary, every day we ask the staff to take their temperature at the gate. We're also wearing masks, and like I mentioned in the last column, washing hands frequently. Keeping everyone safe benefits our employees and our customers. We are committed to staying open and operating at full capacity during these uncertain times. When you need something, be it a part, some

advice, or to give us the latest goings-on in the field, we want to be sure that someone will be here to answer the phone.

We want to be sure that engineering programs continue, and that we are doing everything we can to support owners, operators, and the independently owned Twin Commander Factory Authorized Service Centers.

I've also been using this time to take the temperature of the business. And from where I sit, the company is poised for the future and healthy. We recently hired Andrew Wilson to be the next Technical Service Manager, a critical position that interacts with the Factory Authorized Service Centers. He will make sure the technicians in the field have the resources they need to do their jobs. Andrew is an up-and-comer in aviation. He started wrenching

on motorcycles when he was a kid and since then he has worked on everything from small pistons to military hardware. His most recent position was managing a large fleet of twin turboprops, so he is well accustomed to what it takes to keep airplanes in the air.

Andrew is also that rare breed who loves the mechanical aspects of the machine but wants to enjoy the operating experience, too. He rode the motorcycles he worked on, and he's been a pilot for many years. That will help him build a rapport with owners as well.

We also recently hired Pam Moore as a librarian. Pam will help organize engineering and technical services in a way that will enable us to respond faster and more efficiently to the needs of owners and the Factory Authorized Service Centers.

Finally, when I evaluate the plans for the next year and review all that we're working on today, I see a robust series of engineering

and parts initiatives that are responsive to our customers and critical to keeping our fleet active and relevant. We're also embarking on a more formal program of evaluating all our legacy parts offerings and shortages, and Custom Kit opportunities, looking for even more ways to keep the fleet in top shape.

Our business is looking healthy, the industry is looking healthy and, hopefully, all of us will remain healthy as well. I know these have been difficult times for many, but when I look forward, I see only blue skies ahead.



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FLIGHT LEVELS MAGAZINE

For Twin Commander Owners and Operators. Published quarterly with a circulation of 3,500. © 2020 All rights reserved.

PUBLISHER

Twin Commander Aircraft
An Ontic company
1176 Telecom Drive
Creedmoor, NC 27522
P: 919.956.4300
F: 919.682.3786

BUSINESS UNIT DIRECTOR

Brian Harbaugh

EDITOR / EDITORIAL OFFICE

Ian Twombly
ijtwombly@gmail.com
301.233.3999

PRODUCTION /ADVERTISING OFFICE

Matheson Media Corp. 1024 1st Street
#204, Snohomish, WA 98290
P: 360.862.8040
markm@mathesonmedia.com or
sarahl@mathesonmedia.com





Getting Back in the Air

By Mike Grabbe

The SARS-2 virus, COVID-19, or whatever name you choose has kept you grounded until now. But it is finally time to go fly.

Think about how long the aircraft has been sitting and how many gremlins may have possibly infested the aircraft. Was the aircraft covered, protected, closed up, plugged etc.? Let’s take a walk around and see where we could possibly have troubles.

Piston Commanders can have uninvited squatters in the engine cowlings building nests of straw and dried grasses between the cylinders, just waiting to catch on fire after the engines get up to operating temperatures. In the past we have removed truly amazing quantities of straw that the birds have stuffed into the nacelles. (I recall completely filling two of our large shop trash cans with straw stuffing from one aircraft that sat for two months.) Birds building nests in the bottom portions of the nacelles are easily detectable on a good preflight inspection. You did look, right?

Turbine Commanders can have birds wriggle their way into the nacelles as well. They will enter through the upper cowling vents,

with the same potential for flaming results. Birds, snakes and other critters have been found lurking in the nacelle spaces above the wing—that space formed by the hump behind the firewall in either piston or turbine Commanders.

Both piston Commanders and early turbo Commanders can have mud-dauber wasps build nests in the vacuum ejector port on the right side of the fuselage. Think about what will happen if that instrument and wing boots vacuum system ejector port is clogged. We have also heard of little insects clogging pitot tubes. It’s rare, but it has happened, so it’s a good reason to use pitot covers.

If the aircraft was parked outside after the last flight, did you attach the external rudder lock? Or if the aircraft has been pulled out of the hangar for you by helpful FBO staff—did they attach the external rudder lock before pulling it outside? A good time to check for a possible sheared rudder torque tube.

OK, so let’s assume no squatters, no invaders, and the external rudder lock was/is in place. The cowling covers have

been removed, pitot covers have been removed, and the nacelles cleared. Does the Nitrogen bottle used for emergency gear extension have a full charge? Did you check the bungee cords for condition?

Let’s move to the nose gear. Anytime the aircraft has been towed, and for every preflight, check that the four little bolts on the bottom of the nose strut holding the steering cylinder in place are secure. And look to see that the castle nut and cotter pin are there, keeping the steering cylinder rod attached to the pin on the steering block.

For the engines check oil levels and the hydraulic reservoir level. (Remember the correct procedure for this check?)

The next checks apply regardless of whether you flew the aircraft last or it just came out of maintenance.

Time to look in the cockpit. First thing is the gear handle down?

Now sit in either cockpit seat. Remove the internal flight controls lock. Hopefully it was installed. Move the flight controls full travel to make sure there is no binding and no strange noises generated.

Starting from the left sidewall look at and touch every control to make sure it is in the position you need it to be in for flight. Both pilots and mechanics have been known to leave them in random positions and not where they need to be for next flight. Work across the instrument panel from left to right. Verify the engines controls are free to move and in the correct position for starting. People have left engine control levers in the wrong position with interesting results. End at the right-hand sidewall and verify you have a full charge of oxygen on board.

OK, so far so good, nothing out of place. For the overhead switch panel start on the bottom row on the left, work to the right. For the top row scan from right to left ending at the battery switch (also do this overhead panel check after every shutdown).

Maybe most important... fuel on board?

Mike Grabbe is technical advisor for Eagle Creek Aviation Services.





Creating a Winner

There’s a new energy at an old service center. A mainstay of the Twin Commander Factory Authorized Service Centers for decades, Winner Aviation’s new management has brought a renewed excitement and even more focus on customer needs to the business.

Headed now by turnaround specialist Meg Bianco, Winner sold off the FBO and now operates only airline ground services and an MRO facility in Youngstown, Ohio. In addition to being a Twin Commander Factory Authorized Service Center, Winner is also a Honeywell-approved facility, which translates to discounts on critical engine components, expanded tooling, and additional expertise.

Winner Aviation began nearly 75 years ago as Beckett Aviation

at the Youngstown, Ohio, airport. The airport had just opened, and there wasn’t a fuel provider. Forest Beckett had recently been exposed to aviation through a friend and he saw an opportunity to fuse his new passion for aviation with his abilities in business. A company history says that in the 1950s Beckett invented the earliest type of fractional ownership, and by the 1960s the MRO facility was maintaining about 55 aircraft as part of that business. By the 1980s the company had grown to 18 FBO locations, and in 1995 Jim Winner bought the facility at Youngstown and renamed it Winner Aviation. Rick Hale became the CEO. In 2008 Hale purchased the company, and late in 2018 he brought on high school classmate Bianco to re-energize the organization and plan strategic growth.

Youngstown is not the first place you’d think to put a world-class MRO facility. The winters are cold, big-city services require a bit of a drive, and economic conditions in the area have suffered from a move to offshore manufacturing. But Bianco contends it has the best Italian food outside of Italy, not to mention highly experienced technicians who treat customers and each other like family.

A few of the company’s 30 or so MRO employees have been on the job for more than 40 years, and the average time of service is 23 years. That steady workforce translates to a comfort level from customers. They know who they are going to talk to when they call, they know the names of the people working on their airplane, and they trust the work will be consistent. Bianco said the reason aviators love coming to Winner

is because of the people. “They know they’re in good hands. We will get them safely back in the air on time, and best of all, they get treated like family.”

Trust is part of that relationship. The company philosophy is that customers should never be surprised. Bianco said they never get a surprise bill, and the work is done on time. “People are coming to Youngstown because elsewhere they get one quote and a completely different bill. They don’t have to worry about anything when they think about bringing their plane to Winner.”

Tim Tobey, who runs the MRO business, gave a prime example of this philosophy in action. Tobey is proud of Winner’s pre-purchase inspection capabilities, something the company tends to do a lot of. When we spoke, he had just returned from a few days in Texas preparing a Twin Commander for a ferry flight from its current home to Youngstown in order to be evaluated for a potential buyer. Although the airplane had only sat for a month or two Tobey was worried about some test results from one of the engines, and he wanted to make sure it was safe to ferry the airplane. “My standard is that if I won’t get in it or won’t put my family in it, I don’t think it’s safe to fly,” he said.

The buyer is a California-based customer Tobey hadn’t previously worked with. “Customer communication is key,” he said. “Everyone has to be comfortable.” By keeping the buyer and seller continually updated and involved in the process Tobey was able to build trust with the current owner in order for it to be released to Youngstown, while gaining the confidence of the potential buyer that Winner’s inspection

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Geoffrey Pence, Longtime Twin Commander Technical Service Manager, Flies West

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PENCE WORKING FROM HIS TWIN COMMANDER OFFICE IN ARLINGTON, WASHINGTON

was one of Pence’s chief responsibilities. He was the conduit between the independently owned facilities and the engineering and support staff at the factory. That meant gathering information about areas that needed improvement; helping to communicate new engineering programs, parts, and Custom Kits; and most of all, troubleshooting.

Doug Jacob was a Twin Commander technical service rep in Britain between 1978 and 1990. He first recommended Pence to Matheson, and said he’s always been happy he did. “He got the job done and was diligent,” Jacob said. A good tech rep must be

able to listen, Jacob said, and Pence was certainly good at that.

Ken Molczan hired Pence at Aero Air, “five or six times” and said he was also a very quick study. “He was really sharp on the airplane, no doubt about that.” At Aero Air Pence worked on a variety of airplanes, including former Aero Air owner Swede Ralston’s Piaggio seaplane. One time, Swede apparently didn’t come back from a trip to his cabin in remote British Columbia, so Molczan and Pence went looking for him. They found him at the cabin with a broken swing arm on the gear leg. With welding tools and parts in hand they repaired it right on the dock. It took four days



GEOFFREY PENCE SURROUNDED BY OFFICE STAFF AT GULFSTREAM AEROSPACE – THE LAST DAYS OF GULFSTREAM COMMANDER PRODUCTION.

to do it. “We ate a lot of fish in those four days,” Molczan said.

Soon after Pence retired, Business Unit Director Brian Harbaugh and the team at Twin Commander recognized him for his many contributions with a Lifetime Achievement Award. In addition to Pence’s family and staff at Twin Commander, representatives from Eagle Creek Aviation Services, Aero Air, Legacy Aviation Services, Byerly Aviation and Gemini Air Group attended. It was a fitting tribute to a man who had spent years helping people, either hands-on with fixing airplanes or through advice bolstered by original drawings from the factory where he long ago worked.

Pence passed away at his home on June 15. “He was always willing to participate in anything Twin Commander related,” Harbaugh said. “But most of all he was a mentor and just a good friend.”



Creating Winner

< Continued from page 5



TIM TOBEY, WINNER AVIATION MAINTENANCE

process will be robust enough to ensure he’s getting a solid deal. “I invite everyone to the shop during the inspection,” he said. It’s his way of making the process as transparent as possible.

Pre-purchase inspections are a niche for Winner, but they are just a small portion of what the company can do on a Twin Commander. “There’s nothing we can’t do,” Tobey said. He touts their heavy structural repair and sheet metal work, which often brings them insurance cases. Winner can also do full avionics upgrades, interior refurbishments, and limited painting.



Experience is a major asset in inspection and maintenance work because same-model airplanes tend to have similar issues. Knowing the history of the model, and possibly the specific airframe, makes for quicker troubleshooting and more efficient repairs. “Ninety percent of the time you know where to go because you’ve seen it before,” Tobey said. “It saves the customer time and money and that’s a plus.”

Bianco’s experience as a turnaround specialist usually means she’s in and out of a company quickly. But Winner has drawn her in. She said she loves the passion of the aviation community and

feels proud to be able to serve in a business with such a rich history. But that doesn’t mean there haven’t been changes. She initially faced a culture rooted in tradition. Now when someone says, “That’s just how we do it,”

Bianco’s favorite reply is, “Yes, but it’s a new day at Winner.”

Winner Aviation is offering Flight Levels readers a special discount.

Anyone who books their next Twin Commander 150-hour inspection with Winner Aviation will receive \$500 off. The booking must be made by September 1, 2020. The appointment can be for any time in the next 12 months. All you have to do is mention you saw our article in Flight Levels when you call to make the appointment.

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Meg Bianco

Winner Aviation’s Meg Bianco is that rare aviation business executive who didn’t come up through the ranks by pumping gas, putting in the hours as a primary instructor, or keeping the books. In fact, heading up Winner is her first job in aviation.

Bianco’s career has been defined primarily by her ability to turn around struggling companies. Anyone who has been part of a turnaround effort knows they can be gritty and emotional affairs, but Bianco exudes calm, and a genuine interest in the people at Winner as well as the company history.

Her unlikely path to running an MRO and ground services company came after a chance meeting with owner Rick Hale. Bianco and Hale grew up together in Youngstown, and a mutual friend got them together for dinner when Hale was visiting Las Vegas, where Bianco currently lives. From there they started talking, with Bianco helping Hale informally. After another of Bianco’s turnaround projects finished, Hale asked her to come on fulltime in late 2018.

Bianco’s diverse background includes working for St. Jude Children’s Research Hospital. She has also run a global technology company for 14 years and at the end of the spectrum a degree in fashion, and designs clothes and stage costumes in her free time.

Coming to Winner has opened her eyes to aviation and the people and their passion for airplanes. The business, she said, is straightforward. It’s all about



numbers. But the community is special. “I love any industry where people are so passionate, they will stay in it for 40 years,” she said. “You build strong businesses by having people stay and be trusted experts.”

Her office at Winner overlooks the runway, and early in her tenure she would catch herself just staring outside watching airplanes. “It’s just mesmerizing.” When one of the traveling warbird groups came to Youngstown, she got a ride in a biplane, probably her top aviation experience so far. “I would never have imagined or expected the experience would be as great as it was,” she said. “It was like floating on the wings of angels.”



NEWS

Andrew Wilson Hired as Technical Service Manager



Twin Commander Aircraft has hired Andrew Wilson, a longtime aircraft technician and proven maintenance manager, as the company’s new Technical Service Manager. He replaces Geoffrey Pence, who retired shortly before passing away. (See page 1 and

6.) Wilson comes most recently from Dynamic Aviation where he served as a Maintenance Controller and Flight Operations Support for a fleet of Beechcraft King Airs and Bombardier Dash 8s and other various aircraft on many government contracts. He has experience in onsite technical support, quality assurance, international operations and regulations, government accountability, and hands-on airframe, engine, avionics, and hydraulic work.

In addition to his work as a maintenance technician and

manager, Wilson is a certificated pilot and a member of the US Military. He has served with the Department of Defense in the Middle East several times on various aircraft and projects. He credits his lifelong love of wrenching with working on dirt bikes and other types of motorcycles and cars starting at age 6, when he did hill climbing and track riding.

The Technical Service Manager position is the focal point for many important responsibilities at Twin Commander, but one of the most critical is as a conduit

between the factory and Factory Authorized Service Centers.

Wilson will be relied on for expertise on parts, service techniques, and troubleshooting. He joined Twin Commander on June 1 and will be relocating to Twin Commander headquarters in Creedmoor, North Carolina.

The company has also hired Pam Moore as a librarian. Moore’s duties will include vault and printed document maintenance, maintaining the owner list, subscription information, service bulletin communications, and yearly reporting requirements. Moore started with the company on June 15th.





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Verify Correct Flight Idle Fuel Flow

By Robert Erlick

It is important to have a properly adjusted fuel flow at flight idle on TPE331-powered aircraft. More specifically, instances have been identified in which the flight idle fuel flow was adjusted too low in an attempt to increase descent rates. This practice can adversely affect the flight characteristics at low aircraft speeds.

An aircraft descent rate is affected by its gross weight and thrust. The minimum amount of thrust required to maintain an optimum aircraft sink-rate is normally established during aircraft certification test flights. Moreover, for propeller-driven aircraft, the amount of thrust is a function of propeller blade angle and fuel flow (turbine temperature) to the

engine. Hence, for a given aircraft gross weight, and provided all engine controls are rigged correctly, minimum inflight propeller thrust and thus specific sink rates are dependent upon fuel flow.

Between flight idle (FI) and maximum power, known as the prop-governing mode, the power lever (PL) controls fuel flow (Wf). Moreover, the lowest in-flight fuel flow can be attained by reducing the PL to the FI gate. It is imperative to remember to never reduce the PL behind the FI gate while airborne. This PL position yields what is called Flight Idle Fuel Flow (FI Wf). A higher-than-recommended FI Wf will result in a lower sink-rate and causes “floating” during the landing flare. Conversely, lower-than-the-

recommended FI Wf settings may unfavorably affect aircraft controllability due to excessively high sink rates and Negative Torque Sensing system operation (NTS’ing) during the flare. Remember that NTS’ing occurs when the wind slipstream drives the propeller.

Pilots should occasionally check the FI Wf settings of their aircraft. This can be easily accomplished by verifying the correct rate of descent and confirming the absence of any yawing tendencies during a FI descent. However, each aircraft has its specific FI Wf and rate of descent. Therefore, the respective aircraft maintenance manual should be consulted to ascertain the correct FI rate of descent at a specific gross weight, airspeed, and altitude.

If the FI sink rate differs from the specified value, if the aircraft is yawing, or if there are any indications of NTS’ing during the FI descent, the FI Wf must be corrected in accordance with the applicable maintenance manual procedures.

For additional information on this or any other TPE331 engine operational issues, please contact Rob Erlick at the Honeywell Flight Technical Services Group at (480) 399-4007, or Robert. Erlick@Honeywell.com.



FROM THE SHOP FLOOR

Maintenance Training Adapts to Travel Restrictions



Photo courtesy of Byerly Aviation

Although much of a Twin Commander technician’s learning happens on the job, formalized factory-approved training is a requirement for those working at a Twin Commander Factory Authorized Service Center. Normally an eight-day in-person experience, instructor Mike Grabbe has had to improvise during the worldwide pandemic.

Grabbe is a technical advisor for Eagle Creek Aviation Services in Indianapolis. He’s been teaching

the course at the company for seven plus years. Needless to say, this is the first time he’s had to face worldwide travel restrictions. “Most mechanics are tactile learners,” he said. They want to be able to touch, push, pull, and prod the things they are working on. Although much of the training is spent in a classroom, Grabbe has a variety of bits and pieces he uses to help convey the information as well as any aircraft in the shop at the time of the class. That’s hard to do when

you’re not in person. “It’s one thing to speak and do Powerpoint,” he said. “It makes a heck of a difference when they can go and touch it and see for themselves.”

Because of the travel restrictions Grabbe had to cancel a class scheduled for April. He’s working now with five of the participants to try and reschedule it for sometime in the next few months. Although the class is designed for up to 12 students, five is the most Eagle Creek can handle because of social-distancing guidelines.

Recurrent training is more flexible. Grabbe was able to conduct a class online for a fleet operator at the beginning of March because all the technicians had extensive Twin Commander experience.

Currently there is an in-person class scheduled for September 21 through 30. The class runs a full eight days with another half-day for testing. “Open wide and here it comes from a fire hose,” Grabbe said. “Basically, everything that’s in the airplane is covered.

About the only thing I don’t cover is interiors.” “Everything” includes service publications, inspection programs, landing gear, flight controls, electrical system, fire suppression, annunciators, environmental systems, fuel, and engines. Because EASA does not count exam time as training time, the class is now an eight day event to accommodate technicians under EASA rules. Technicians working on European-registered aircraft will need an additional 30-hour engine-specific class, and some practical hands-on experience at home to complete the training.

Grabbe has decades of teaching technicians how to work on Twin Commanders. After many years as a floor mechanic for various operators he taught in a FAR 147 approved A&P school for more than nine years, and then the Twin Commander course at FlightSafety for more than six years.

For more information about Twin Commander maintenance training, contact Eagle Creek at 317-293-6935.





Twin Commander Tribal Knowledge

Moving up to a more complex, higher-performance aircraft involves several stages of learning. First is the research done to arrive at the decision to buy a particular make and model. Call it the kindergarten phase.

Second is primary school. It's the formal pilot transition training that typically involves a deep dive into systems, limitations, normal operating procedures and emergency procedures, plus hands-on simulator or in-airplane flight training.

Next comes secondary school, which is the knowledge and confidence gained through the experience of real-world flying.

And, finally, there's the fourth stage of learning, the graduate course. The textbook for this course is published by an institution of the highest learning—the school of hard knocks. The textbook's authors are the many pilots who have been operating the same make and model aircraft for many hours over many years.

Collectively they've encountered all of the situations, all

of the problems, and through trial and error, ingenuity and sometimes good old-fashioned luck they have figured out techniques, tips and tricks to solve problems or, better yet, avoid them in the first place. The lessons aren't always about solving or avoiding problems, however; many are intended to accomplish tasks more efficiently.

The fourth stage of learning how to fly a particular airplane, in our case a Twin Commander, is acquiring the tribal knowledge.

We'd like to open that tribal knowledge textbook and see what it says, find out things we can do to make our flying more efficient, more problem free and more enjoyable. We'll take those lessons from two sources. First is by picking the brains of the many highly experienced Twin Commander pilots flying today and who have come before. Second, we want to hear from you. What have you learned that makes you a better Twin Commander pilot? What tips,

tricks, techniques and insights can you add to the tribal knowledge textbook so that others can benefit?

We'll start where all Twin Commander flights start—with engine start. That's the topic we'll focus on in the next issue of *Flight Levels*. We'll have some comments from recognized Twin Commander pilot experts, but we also want you to go to your bookshelf and pull out your annotated copy of *Twin Commander Tribal Knowledge Secrets Revealed*, turn to Chapter One, Engine Start, and let us know what notes you've made in the margins. What issues have you seen on engine start under a variety of conditions, and what workarounds have you used to deal with those issues? We'd like to include your comments in the next **"Tribal Knowledge" column**.

Please email your comments to *Flight Levels* editor, Ian Twombly, ijtwombly@gmail.com, and we'll start our engines.





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A Powerful Aircraft Purchase Incentive in the CARES Act

Understanding the Value of Equipment Expensing and Carryback Net Operating Losses

By Suzanne Meiners-Levy

In uncertain times, businesses and individuals often delay large purchases and investments they had long anticipated, and that will ultimately serve the long-term interest of the company, for fear of uncertain outcomes or with a mistaken belief that it is not the right time. In our practice, where we interact with over 1,500 general aviation owners and operators on an on-going basis, we have fielded many questions and concerns about purchasing and operating company aircraft in 2020.

Anticipating this anxiety, coupled with the real economic loss that is anticipated as a result of the impact of COVID-19, the drafters of the CARES Act reinstituted powerful tax incentives to motivate companies to move ahead with equipment purchases in 2020. This article will focus on one of those incentives—the carryback net operating loss (NOL) and how it can serve to both help finance the aircraft purchase and provide additional working capital for your business.

The background

The 2017 passage and signing of the Tax Cuts and Jobs Act (TCJA), the Trump administration's tax reform package, reshaped the business and individual tax landscape. A highlight of the TCJA was the revision of the bonus depreciation provisions pursuant to Section 168(k) of the Internal Revenue Code to allow for 100 percent bonus depreciation for qualifying new and pre-owned aircraft purchased and placed in service after September 27, 2017, gradually phasing down beginning in 2023. Additionally, Section 179 expensing elections have

increased substantially, allowing additional first-year write offs for equipment and component parts placed in service. In order to use bonus depreciation, the equipment must be used at least 25 percent of the time for qualified business use, and at least 51 percent of the time for total business use.

Additionally, the TCJA cut business tax rates, with the most substantial rate cut going to C-corporations. Closely held companies and individuals also experience small rate cuts, coupled with potential taxable income deductions for qualifying businesses.

The CARES Act's NOL provisions

On March 27, President Trump signed the Coronavirus Aid, Relief, and Economic Security Act (also known as the CARES Act), a \$2 trillion stimulus package intended to help mitigate the economic impact of the coronavirus.

The CARES Act includes changes to the tax treatment of business net operating losses (NOLs) for corporations and other taxpayers. An NOL occurs when a company's tax deductions exceed its taxable income within a given tax period. While the TCJA had allowed carry-forward NOLs (with some limitations), it had not allowed businesses to carry NOLs back to prior tax years. The CARES Act now allows a five-year carryback of any NOL generated in a taxable year beginning after December 31, 2017, and before January 1, 2021. In addition, fiscal year 2017 returns (returns that began before January 1, 2018, and ended after December 31,

2017) can now be carried back two years as a result of the technical correction to the effective date language in the TCJA (which originally applied the prohibition on carrybacks to taxable years ending after December 31, 2017).

The mechanics of the NOL

Generally, the entire amount of the NOL for any taxable year (a loss year) must be carried back to the earliest taxable year to which such loss may be carried. (In the event that a business activity did not begin until a later year, i.e., 2017, the loss gets carried to that year first. In the event that the five-year period cannot absorb the full deduction, a taxpayer may be able to carry forward the additional loss into 2021 or elect an alternate depreciation deduction.) Such carryback must be applied until the maximum NOL is absorbed with respect to that year. Any remaining NOL is then carried forward to the next carryback year, and so on.

For example, if I purchase an aircraft for \$1 million in 2020 and am eligible to take bonus depreciation, I first use that deduction against this year's taxable income. Should the \$1 million exceed my net income, I can go back to my prior-year returns, beginning in 2015 if I had taxable income in the activity in that year, and generate a tax refund from the IRS for the previously paid taxes. If my \$1 million deduction is still not exhausted, I then carry the remainder to 2016, then 2017, and forward until I have been able to utilize the full deduction to generate tax refunds.

The value of the NOL

Why is the carryback NOL a powerful business tool? Many companies have had robust years building up to 2020 and recognize the utility of general aviation aircraft in the years ahead as the economy eventually returns to normal. The carryback NOL allows companies to tap into the value of those prior years—and the significant tax revenues that they generated—in order to plan for the future. By filing a 2020 return with a carryback loss reflected, you can generate a refund from prior year taxes that creates working capital now. For companies that experienced a significant rate change in 2018 as a result of the TCJA, the value of the refund is even higher because it occurs at the tax rate that applied to the return rather than the current lower rate, increasing the true value of the deduction.

General aviation aircraft grow businesses and allow them to work more efficiently. In the current economic and political climate, they can provide peace of mind when commercial airlines are cutting routes and causing significant anxiety among some travelers. The carryback NOL in the CARES Act stimulus may mean that 2020 is a great year for an aircraft investment for your business.

Suzanne Meiners-Levy, Esq. is a Shareholder in Advocate Consulting Legal Group, PLLC, which serves the needs of general aviation clients throughout the country.

For more information see www.advocatetax.com.





Photo courtesy of Byerly Aviation

Digital Autopilot Basics

By Keith Thomassen, PhD

In an article here several years back, titled “Navigation Gone Digital” www.avionicswest.com the general impact of various digital navigation devices and the capabilities they encompass were described. This article deals specifically with using digital autopilots in typical flight situations, and illustrates the things they can do to ease pilot workload. It should be noted that digital autopilots have been available for over a decade from Garmin, TruTrak, and Avidyne, but the combination of newer GPS navigators, EFIS systems, and digital autopilots from Garmin, BendixKing, and S-TEC have given them even more value.

Digital autopilots use the digital pitch (GPSV) and roll (GPSS) commands from GPS navigators, unlike analog autopilots that cannot use pitch commands, and must have the roll commands first converted (sometimes internally) to heading commands to follow them in HDG mode, often by selecting them with a GPSS converter switch. Modes like IAS (indicated airspeed) and VNAV (vertical slopes from baro-altitude waypoints) are also features of these new autopilots.

These autopilots also offer other modes of operation to assist in different flight situations. Altitude preselect is a common one, as is the ability to climb



FIGURE 1. THE S-TEC 3100 (TOP LEFT) AND GFC 500 (BOTTOM LEFT) CONTROL UNITS ARE SHOWN HERE, ALONG WITH A G5 PFD (RIGHT) WITH AUTOPILOT MODE ANNUNCIATIONS ON TOP. THE SAME LEFT/RIGHT MODE PRESENTATION IS SHOWN ON THE TWO AUTOPILOTS.

or descend at constant vertical rate or indicated airspeed. You may be able to follow a specific magnetic course over the ground (TRK mode), reverse the sensing of a back-course approach (BC mode), or return to level flight (LVL mode). Some units offer envelope protection in the event that prescribed pitch or roll angles are exceeded. Enroute baro-VNAV courses from newer navigators can be tracked if your EFIS displays that vertical course on a VDI (vertical deviation indicator) as it does for GPS or ILS vertical courses. (This may not work with mixed manufacturers of the GPS/EFIS/Autopilot combos).

Generally, you can arm a mode while flying another mode. Typically, flying HDG mode towards a GPS flight leg, the course of that leg is “armed” by engaging the NAV button on the autopilot, and the automatic transition is made when you get close to the course. On the G5 display, autopilot modes are displayed at the top of the unit. The division of lateral modes on the left of the AP (or Flight Director, FD) selection in the middle, and vertical

modes on the right, is typical.

On the G5, the HDG mode is active (green) and the GPS mode is armed (white). On the right, the ALT (hold) mode is active, while a GPS glide path (GP) is armed. Similarly, if you set a preselected altitude in the autopilot, then engage IAS or VS, you will climb in those active modes while ALT is armed. Garmin uses ALTS for selected altitude and ALTV for a VNAV altitude, and a VNAV vertical course is called a VPTH (vertical path) and starts at the TOD (top of descent) point. Garmin navigators only provide VNAV descents, but Chelton EFIS systems create both VNAV climbs and descents. Currently, the S-TEC does not have the VNAV mode although it is a planned upgrade.

On the S-TEC 3100 and the GFC 600 mode annunciators are on the faceplates. Again, lateral modes are on the left, and vertical modes are on the right. Also, active modes are on top, and armed modes are below them. Modes can also be shown on an Aspen, G3X or G500 EFIS, or on

Continued on page 17 >



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FIGURE 2. A FLIGHT PLAN FROM KGOO TO KMYV ON FOREFLIGHT (LEFT), AND THE ACTIVE FLIGHT PLAN (RIGHT) CONSISTING SOLELY OF THE RNAV 32 FLIGHT LEGS. ACTIVATING THIS APPROACH CREATES THE LEG D-> OTRUW.

New Book Offers Complete History of Twin Commanders

< Continued from page 1

license in college. I pursued an aerospace engineering degree, and had a 26-year career in the Air Force. During that time I bought a Citabria. I was single so I could get away with it. Had that a few years and started taking aerobatic lessons. Moved up to a single-place Pitts for nine years. I earned my instrument and multiengine rating under the GI Bill, bought a Twin Comanche, and thought when I got out that I probably wanted to fly professionally. After six years I sold the Twin Comanche and bought a 1980 Aerostar 600A with a partner. We went from 165 knots to 210 knots. I loved that airplane and bought out my partner. I got my ATP in it and had it for 20 years. After retiring from the Air Force, I flew Part 135 charter in Learjets and then flew a corporate Pilatus PC-12.

Q: Why did you write the book?

A: In 2007 I was attending an Aerostar annual association meeting in Nevada and Niels Andersen, one of the original builders of the Aerostar, was a guest speaker. He just mesmerized the whole audience with the philosophy Ted Smith had building the airplane and how it revolutionized building twins. Somebody mentioned that Ted had written a memoir of his life that was unpublished. So, I asked around to several of the old timers and learned that Ron Smith, Ted Smith's son, had the memoir. He said you're welcome to come out and take a look at it. I got to spend a few days with Ron and his wife Karen. What followed was reading the memoir and reorganizing and condensing. Ted was quite the chatterbox. That was the start. You start asking various people about this, that, and the other thing. From their background working for Ted Smith, or working at the factory, or being an early Aerostar or Commander owner you end up having a network of 30 or 40 people contributing to the book. Aerostar people and Aero Commander people are terrific folks.

Q: Who helped you during the research phase?

A: I've always been a student of the Aero Commander, but I realized early on that I was in no way knowledgeable. I enlisted the help of several folks who knew more about it than I did, especially Bill Leff who's right here in Dayton, Mike Grabbe from Eagle Creek Aviation Services, and

Geoffrey Pence from the factory. I saw Jim Matheson in Arlington, Washington. Jim was very good, pointing out a lot of info for me. And of course, probably the guy who is without peer is Barry Collman. We struck up a two-year email conversation of dozens and dozens of emails back and forth both before I wrote the manuscript and after I wrote the manuscript. Barry was a tremendous help.

Q: What surprised you in your research?

A: The wow moment was evident when I realized how many revolutionary things Ted had incorporated into his Aero Commander and his Aerostar, especially the Aero Commander. The Aero Commander was an incredibly revolutionary aircraft. There was no market for it. There was no light twin. Ted believed he could take the horizontally opposed engines that were being developed to come up with a nice little five-place twin that would have as good a speed as the DC-3, which at the time was the benchmark. That was his goal, to have an airplane as fast as or faster than the DC-3.

Q: Why do you think the Commanders are so important to aviation history?

A: In addition to the plane being revolutionary and designed to fill a niche in the market, it was the first light twin to have constant-speed full-feathering propellers, the first plane to have a swept vertical tail, the first light twin to have 3-bladed propellers, the first light twin to fly a president, the first light twin to have superchargers, and the first pressurized light twin. And when the Jet Commander came along it was the first business jet to fly. The Learjet was flown a little later. The Lockheed Jetstar and the Sabliner were around, but designed to meet military requirements. Bill Lear and Ted were in an informal competition to get in the air first and Ted did get in the air first. That made Aero Commander the first GA airplane company to offer a jet.

Q: Commanders have evolved significantly over the years. Is that a testament to Ted and the team, or do you think the credit goes to later manufacturers?

A: Ted speaks to how when he was the project engineer at Douglas for the A-20 they produced more than 20 versions. He started that job the day after Pearl Harbor. What he learned there was the natural progression of airplanes to grow in gross weight and change configurations. When the Aero Commander was designed, he designed it to higher gross weights than the original configuration. He had a lot of things in mind. When you look at the difference between the very first Aero Commander, which is the prototype, the L3805, and the very next production configuration model, the Model 520, there are so many changes. It's a significantly different looking airplane. But yet the internal structure is basically the same. That allowed him to move steadily with improvements through the years by making changes under the existing type certificate.

Q: How did Ted feel about the turboprop versions?

A: His version of the Aero Commander with a turbine in it was more like a 690 where the engines were farther from the fuselage than they were in the original 680 series. He remarks in his memoir he had no idea why they didn't follow through with his original concepts that he was working on when he left Rockwell in 1963.

Q: Why did Ted leave to start the Aerostar?

A: This guy was a visionary. He saw a market for the Aero Commander when no one else did. He also told Rockwell in 1963, "Guys, the Aero Commander was designed in the 40s. It's time we look at coming up with a new generation of twin that will allow us to remain in the leadership role in the twin market." At the time their share of the market was more than half. The Aero Commander was looked at as a prestige airplane. Many very large companies bought Aero Commanders. He wanted to maintain leadership in that part of the GA market and Rockwell agreed that it would be nice to do, but they were maxed at the

time financially with developing the Jet Commander. That's why Ted left Rockwell and started Aerostar, which in his mind was the next generation twin.



Q: Do you have a favorite model?

A: I think the 560F was a great model. In the turbines I like the 840 Jetprop. Ted's favorite was the 680. He continued to own that. He never owned or had an Aerostar as his personal plane. All through the time he was running Ted Smith Aerostar he kept the 680. He loved that airplane.

Q: What do you think the book offers?

A: The book is three things. It's a biography of Ted Smith. It's also a story about a lot of the people who worked for Ted, many who are largely responsible for Ted's success. He was blessed with great engineering teams and prototype shop people, and blessed with some good backers. And the third thing I think it achieves is providing a reference about the various models of each of his aircraft. The Aero Commander, for example, has 30 models. There's a chapter on the evolution of the Aero Commander and a chapter on the evolution of the Jet Commander so people can see how these designs progressed from one model to the next and what unique features each of these models has.



Model 690C “Jetprop

By Barry Collman

The Model 690C, marketed as the JetProp 840, was the twenty-fifth type to be placed into production, the first 63 by the General Aviation Division of Rockwell International Corporation at Bethany (Wiley Post Airport), Oklahoma City, Oklahoma; the next 52 by Gulfstream American Corporation, Commander Division; the penultimate one by Gulfstream Aerospace Corporation, Commander Division; and the last one of this model by Gulfstream Aerospace Corporation, Oklahoma Operations.

The 122 examples were built between May 1979 and May 1985, serial numbers 11600 through 11703; 11709; and 11719 through 11735.

Of these, 16 were initially certified in 1979, 41 in 1980, 48 in 1981, 10 in 1982, 3 in 1983, 3 in 1984, and 1 in 1985.

A factory document describes the Model 690C as “Certified September 7, 1979. Similar to the 690B, but several changes were made. The most notable changes were: a) 30-inch wing tip extensions added; b) increased seating from 10 to 11; c) Zero fuel weight reduced from 8750 to 8463 lb.; d) AiResearch TPE331-5-254K engines; e) Dowty Rotol propellers; f) engines canted down 2 degrees; g) wet wing outboard of the nacelles added; h) fuel capacity increased from 384 to 425 gallons; i) nacelles redesigned; j) landing/recognition lights were added to the nose; k) extended baggage compartment floor; and l) canted wing tips added.”

The model 690C was indeed certified on September 7, 1979, under Type Certificate 2A4 and had AiResearch TPE331-5-254K

engines. The first example had the 106-inch diameter Dowty Rotol (c)R.305/3-82-F/8 “supercritical” propellers (blade model not known), while the next 114 used the (c)R.306/3-82-F/7 / VP2926 (with a B.F. Goodrich de-icing kit), and the last seven the (c)R.306/3-82-F/7 / VP3027 (with Dowty Rotol de-icing boots). The Dowty Rotol propeller had a supercritical-type blade form whereby the blades selected for a particular propeller assembly were not only matched in weight but also in centroid. This made for very smooth-running propellers. While performing propeller strain gauging flight tests in Bethany the Dowty Rotol technician made the comment that a slight downward tilt of the engine installation would position the propeller disk more perpendicular to the airstream, thus resulting in smoother operation as well as longer propeller life.

TPE331-10T “Dash Ten” series engines are available for installation under STC No. SA236CH.

Gross weight is 10,325 pounds and the cabin pressure differential is 5.2psi, giving a 13,000-foot cabin at 33,059 feet and a sea-level cabin at 11,595 feet.

Although the cabin pressure remained at 5.2 psi, same as the 690B, a new direct-bleed environmental system was incorporated. This system had been designed for the pressurization increase planned for the new model 695A/690D fuselage. It was utilized on the 690C to take advantage of a 60-pound weight saving over the old multiple jet-pump system used in the 690B.

Total fuel capacity is 430 U.S. gallons (1,628 litres) as standard,



A digital image taken by Jarrod Wilkening on February 25, 2017 at Houston- David Wayne Hooks Memorial Airport, Texas, N777NV is serial number 11680. Originally Certificated on June 19, 1981 it was exported to Distributor, Commander Jetprop de Venezolana, in Caracas, Venezuela as YV-415CP, for SA Construcciones y Parcelamientos (SACONPA), of Valera, which is in the State of Trujillo. In December 1988 it returned to the United States as N7052J and after a spell in Mexico as XA-JYNM, became N680WA in December 1996, then N777NV on February 9, 1998 with the State of Nevada, Department of Transportation, in Carson City. As clearly evidenced in the image, a Zeiss RMK aerial survey camera was installed in January 1998, together with photographic glass in the emergency exit window. At the same time, the standard TPE331-5-254K engines were replaced by TPE331-10T-511K, with Hartzell “Q-tip” propellers. In April 2020, new registration marks were assigned, being N885LV.

with an optional capacity of 482 U.S. gallons (1,825 litres). Two complete and independent fuel systems were created. This was the first time a Commander deviated from the single-tank concept. The center fuselage sump was replaced with a sump and fuel pick-up area in each system, just outboard of the fuselage and forward of the rear spar. The submerged-type boost pumps used on all previous Commanders were now replaced by inline-type boost pumps located in the nacelles. Each fuel system supplied its respective engine. An interconnect valve (normally closed) in a centerline wing bulkhead allowed fuel to flow by gravity from one system to the other in a single-engine or fuel-imbalance situation. The increase in usable fuel quantity to 474 gallons involved the following:

One additional flexible fuel cell was added in each system outboard of the MLG wheel well and forward of the rear spar. The entire wing torque box outboard of the nacelle (including wing panel extensions) was redesigned as an integral fuel tank. All fuel inboard of the nacelles remained in flexible cells. A single fuel port for each system was located outboard of the nacelle in the wet wing area. This combined with an increased number of enlarged interconnect tubes across the nacelle area made a great improvement in fuelling time. Marketing literature says 474 gallons could be now be put aboard in 20 minutes.

The Model 690C was the first of those marketed as the “JetProp” series and had a longer wingspan, with 32-inch panels added outboard of the ailerons and “winglets” giving an increase in total span to 625.47 inches. The landing lights were re-positioned back to the nose, as preferred by pilots, who had commented that the extension speed limits on the retractable wing-mounted lights precluded their use as recognition

lights on high-speed let-downs.

From serial number 11719, the Model 690C also featured a cosmetic dorsal fillet, but this time it was a much shorter one that started higher up the fin.

On March 25, 2004, serial number 11640, registered as N840KB, was issued a Certificate of Airworthiness in the Experimental - To Show Compliance category, for collection of performance data applicable to the FAR requirement of RVSM (Reduced Vertical Separation Minimum). This reduces the vertical separation between Flight Levels 290 to 410 from 2,000 feet to 1,000 feet and thereby makes six additional flight levels available for operation.

Barry Collman’s lifelong interest in airplanes began when he was growing up in a house located underneath the downwind leg to busy Northolt aerodrome, an R.A.F. base near London-Heathrow airport. As a young teenager he discovered airplane “spotting”–hobbyists’ observation and logging of aircraft by make, model, and registration number. The hobby began to grow into a passion as Collman joined a club of like-minded spotters. At one point he purchased a copy of the January 1966 U.S. Civil Aircraft Register, and thumbing through it came upon the Aero Commander. He was hooked. Eventually he acquired every available FAA microfiche file on Commanders, and since 1995 has made annual pilgrimages to Oklahoma City to sift through FAA records. He now has a database with about 100,000 records as well as a collection of negatives, slides, photographs, digital images, magazines, brochures, knick-knacks–and a very understanding wife. This series on Commander production history originally was written for the Twin Commander Flight Group, of which he is an enthusiastic member.



Scanned from a slide taken by Mike Madden in March 1980, shortly after arrival at Moorabbin Airport, Victoria, Australia. N5871K is serial number 11619 and was finished in factory paint design #Standard, in Bavarian Cream, Condor Gold Metallic and Medium Bronze Metallic. Certificated on February 8, 1980, and having had an Export Certificate issued on the same day, it was sold to the Australian Distributor, Civil Flying Services Pty Ltd and then registered in Australia as VH-UVT on October 16, 1980. Ownership having been transferred a couple of times. It was exported back to the United States and became N16TG on July 6, 1990. After having been re-registered as N86ST in October 1992, it became N72TB in December 1992 and is currently registered as such. Note the nose lights and the absence of a dorsal fillet, a feature thatwas not incorporated until serial number 11719.



Uncertainty Turns to Optimism

When the world hunkered down and went into quarantine earlier this year, many in aviation feared the worst. A worldwide recession far beyond what we saw in 2008 seemed plausible. Yet, after a downturn in sales and operations that lasted about a month, activity in many parts of aviation came back strong, pointing to an optimistic future.

Eagle Creek Aviation Service's Jim Worrell said the maintenance business is strong, and prospects are starting to complete deals. "We're picking up speed," he said. Byerly Aviation's Bruce Byerly has a similar take on the current market status. "Some pretty nice

airplanes have sold recently," he said. "The Commanders are soldiering along steadily."

Some of the downturn during the pandemic seemed to be strictly logistical. A lack of travel made it difficult to move airplanes and connect buyers. Worrell described a deal he couldn't complete because the buyer was Canadian and decided not to wait any longer for the borders to open. He opted to buy something closer to home.

In terms of the current market, supply has been more limited recently than it was at the end of last year. At the time of this writing there were about four

1000s, one 980, one 900, and about 12 690As actively listed. According to Byerly that supply is down 30 to 50 percent from the end of the last year. Curiously, that hasn't resulted in higher prices. Airplanes are selling faster, supply is tighter, but prices ticked down slightly. Byerly attributes the unusual market behavior as a symptom of the overall volatility.

Both Worrell and Byerly forecast a decent year despite a challenging first quarter and it being an election year. Worrell said his inquiries had been averaging 10 a month, and now he estimates it's more like 25. "Some weeks I get three a day," he said.

Larger general aviation activity markers indicate that private flying activity has fully recovered. Foreflight said IFR filings are back to pre-quarantine levels, and FAA data from a random sampling of airports shows the same.

As borders reopen and destinations begin to accept visitors in the way of open hotels and restaurants, it seems clear that with the exception of the airlines, aviation activity will fully recover in the mid-term.



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Digital Autopilot Basics

< [Continued from page 13](#)

a separate unit like the GI 285.

Two other typical features are CWS (control wheel steering) and GA (go around) modes. If the autopilot is engaged and you want to temporarily disengage, use the CWS button on the yoke to do that. While depressed, you can change the roll/pitch attitude of the airplane, and when you let go the autopilot will engage in the new ROLL and PITCH attitudes. On the S-TEC 3100 and GFC 500, when the GA button is depressed to go missed the autopilot disconnects and commands the FD bars to a wings-level new pitch attitude for your aircraft.

Let's fly a typical flight: takeoff and climb to a selected altitude, select a lateral course, then cruise to a destination, shoot an approach to a landing, and a missed approach. After start-up, turn on the autopilot and trim master switches and allow the ADAHARS (in the S-TEC 3100 and GFC 600) to initialize. Before takeoff, be sure the controls are free and correct, then turn on the autopilot and do the lateral and vertical mode checks spelled out in your manual. Now, preselect an altitude.

After takeoff, you should climb to about 500 feet before engaging the autopilot (or FD if you want to hand fly). With the aircraft cleaned up and a climb attitude held, engage the AP to hold this attitude. It now shows Pitch and Roll as the vertical and lateral modes. Next, sync the HDG bug to

current heading and then engage HDG mode on the autopilot. Then, select VS or IAS to climb to the selected altitude. Use the thumb wheel or Up/Dn buttons to adjust the climb rate or speed. Finally, select a lateral mode (or modes) to join your flight plan route.

To descend enroute and in the terminal area, use the altitude pre-select and the VS rate while tracking the GPS course in NAV mode. The 3100 will announce NAVGPSS while in this mode. If you're tracking a VOR course it will simply show NAV. If you select APR before reaching the final approach course it will say APRGPSS until reaching final, then it says APRGPSL (L for lateral). If the approach were an ILS, it would say APRLOC. These different announcements for the NAV mode are very transparent—a nice feature of this autopilot.

Let's describe in more detail the steps for approaches into nearby Marysville (KMYV) from my home airport of KGOO (elev. 3158 ft). They have an RNAV 32 (LPV with 250-foot minimums) and an ILS 14 with 200-foot minimums. The flight plan is shown in Fig 2 on ForeFlight, along with the flight plan in the GTN 750 consisting solely of the approach. There's no need to make a flight plan with origin and destination on the 750; it can be a procedure all by itself. To do that, select PROC then Approach and fill in KMYV, RNAV 32 GPS LPV, and

the transition at OTRUW. Now, Load and Activate the approach to proceed D-> OTRUW from KGOO, climbing to 4000 feet.

On the ground at KGOO we'll enter 4000 feet for a preselected altitude, set the HDG bug to runway heading, ensure that the 750 CDI selection is GPS, then climb 500 feet and engage the AP in HDG and VS modes. After a left turn, re-center the course by going D-> OTRUW, then engage NAV mode. On the 750, VNAV target altitudes are shown next to each waypoint on the approach. We continue to OTRUW at 4000 feet, but shortly beyond that the 750 map shows a TOD point, which is where the first VPTH course begins, descending to VUJOR at 2000 feet. To couple to that slope, push the VNAV button on the GFC 500 to arm VPTH before reaching the TOD.

After descending to 2000 feet and turning the corner at VUJOR, engage the APR mode, which is necessary to arm the glide path or glideslope on all autopilots. Continuing on the VPTH to the final approach fix the GFC 500/600 will automatically switch to the GP mode between VUJOR and the FAF if you have enabled auto switching on the 750 (on the Home page, go to System, then Setup). On the S-TEC 3100, the descents should be made in VS mode to hit the target altitudes, and when APR is selected after VUJOR, the GPSV mode is armed. If you are above

the glide path, use the VS mode to descend to it, because when the GPSV mode is armed it can capture a GP or GS from above.

At the decision altitude push the GA button to disconnect the autopilot, add power and pitch to the FD bars, raise the gear, then the flaps. Passing the MAP, choose to sequence to the missed approach on the 750 (Activate GPS Missed Approach), and after established in the climb engage the AP in Pitch and Roll modes in present attitude. Sync the heading bug to present runway heading and engage HDG mode. Set the altitude to the missed approach hold, then engage VS mode.

Since we're initially flying along the outbound ILS 14 course, we request vectors to the ILS. On the missed approach to RNAV 32 we can add a new approach without eliminating the remaining legs of the current approach. With the autopilot doing the flying, we select and "Load and Activate" the approach, which makes the VTF leg active. These busy moments are when an autopilot earns its keep. Follow ATC instructions using the HDG bug for vectors and use altitude preselect and IAS or VS to climb to assigned altitude.

The new approach is shown in Fig 3, after selecting ILS 14 and Vectors. On the left screen, after initiating the missed, we're on a 350-degree vector and our current active leg is VTF 141 degree

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An Inauspicious Beginning

By Thierry Pouille

In the last few weeks we all have been confined to our homes as witnesses of a changing world. As of this writing hope is appearing, and we will slowly but surely go back to a world that we've enjoyed before.

During this time I decided to reflect on the opportunity I had in creating and operating Air Journey, and I would like to share with you one of the chapters that will appear in a book I am writing.

The story is about my first Air Journey in 1998.

Back in 1981, I came across a travel offer to fly with a group of pilot/owners to Timimoun, the red oasis in the middle of the Sahara Desert in Algeria. The trip promised several stops in Algeria.

I signed up as a participant and flew with a friend in a V35 Bonanza. This experience created lasting memories. A private plane is one of the best ways to discover the most hidden places on earth.

My initial goal was to approach European pilots to see if there was any interest in flights traveling around the United States and Caribbean. I decided to ask the pilot behind the Algerian journey to find out if he would have an interest in marketing a journey to the Bahamas to European clients. The request was answered with a very positive yes.

After creating an itinerary to visit about five Bahamian islands, I also secured rental aircraft from a flight school in Florida,

making sure we had all the proper airplanes based on the requests of the participants, including all the survival equipment like life vests and rafts. The group soon arrived from Europe—one crew from Switzerland, two crews from France, and the gentleman who organized the Algerian journey flying with me.

The morning we were planning to leave I got a call from the brand-new chief pilot of the flight school, who had just started that morning, asking me if everybody had a U.S. pilot certificate. When you fly an N-registered aircraft, you must have an FAA certificate and I was the only one with the certificate. This resulted in having to find an FAA expert who was willing to convert the European licenses to the FAA requirements.

The interesting thing was that the day before I had asked the owner of the flight school whether we needed the certificate and the answer was no. So now we had a journey ready to go, we had the people on site, we had the planes reserved, but we couldn't fly them because of lack of proper paperwork.

A fast call to the then-office of the FAA in Fort Lauderdale told me that it was pretty easy at the time to get a U.S. certificate by equivalence. We simply had to meet with the gentleman who was accredited by the FAA to do such a thing. I reached out to him and he was able to meet us in 90 minutes at Lantana (KLNA).

The rental fleet was based at Stuart, about an hour north.

We all drove to Lantana to meet a character who was helping the FAA on the side. His background was a B17 pilot during World War II flying over Europe, and he was traveling with a trusted typewriter. How many of you remember what they look like?

We sat down in one of the offices at the Lantana Airport and provided him our credentials – European pilot licenses – for him to transcribe into the official FAA paperwork.

Interesting side note: He asked each one of us, except for me, for a fee of \$100 – some money at the time. I was kind of surprised that there was such a fee imposed by the FAA. But we were in a hurry. The Bahamas were waiting.

Before he left, he offered us a book and asked us what language we would like it in. Instead of covering FAA guidelines, airspace or the environment, it was a Bible of Jehovah Witnesses. We said thank you and went on our merry way back to Stuart and then the Bahamas.

We had 10 exciting days in the Bahamas and then it was time to come back to the United States. We flew from Bimini to Miami Opa-Locka Airport and cleared Customs. Everything worked well. At the time there was no eAPIS requirement, thus there was no need to call Customs

ahead of time. We simply filed a VFR flight plan and put in Box 18 an "Add for Advise Customs" and we were good to go.

After clearing Customs with no problem, it was time to fly back to Palm Beach International Airport. My mistake! At the time, I was our journey director and was not in the lead airplane, but rather the last.

As you recall, there were four airplanes traveling; however, we ended up with three 90-day FAA certificate suspensions. So, what happened? Well, the first plane coming in was flown by a German-Swiss gentleman who was a pretty strong character, as we saw previously on the journey. He was not accustomed to the way flights were handled in the United States, and he basically told the controller that he was going around Palm Beach International to make the pattern he wanted. The controller asked his intentions when he cut over the main runway. A rather heated exchange followed that I was not privy to, but basically the pilot complained that the controller didn't tell him to descend; however, he was cleared for the option. On top of that, the controller said, "You are in my airport airspace and I am the one telling you where you fly. Now, since you cut the main runway, you are going to reposition yourself for a second VFR approach, and when you land, call me. This is the tower number." Ok, one down.

Airplane number two was a younger French couple that had a

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An Inauspicious Beginning

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little language misunderstanding or difficulty understanding English. Unfortunately, another airplane was on the approach with the same ending tail number. They took all of the other airplane instructions for themselves and as they were approaching Palm Beach they told approach, “We are entering the downwind, what do you want us to do?” Approach said, “Who are you, where are you, where are you going?” They were then switched to tower, and the controller said, “Call me after you land.”

The third airplane was a French couple, both doctors, flying a Grumman Tiger. They understood English and communicated pretty well. They lined up for Runway 9 Right (now 10R), which from the air looks very short (it’s about 3,200 feet), while 9 Left looked very appealing with about 10,000 feet of runway. Out of nowhere they decided to sidestep and land on 9 Left, to the misery of a US Airways

737 that had to perform a go-around. Guess what? The ground controller gave them instructions to call when they shut down.

In the meantime, your journey director, Thierry, was approaching Palm Beach, made contact with approach, and the controller said, “Palm Beach Class C is closed. We have a bunch of clowns here.” That must be my clowns! I made 360s over the ocean waiting for the call to come in. Eventually the controller said, “The clowns have landed. Class C is re-opened.”

Long story short, I landed, went to the FBO, shut down and the FBO customer service representative looked at me and said, “Thierry, here is the number. The tower wants to talk to you.”

That’s how all three ended up with 90-days certificate suspensions. Thank God I did not quit on the Air Journey concept after that first rather unusual



experience. Since then I have never had—knock on wood—a controller give me a number to call the tower.

Air Journey founder Thierry Pouille has visited 172 countries and landed in more than 95 in his or Air Journey participants airplanes. For more information on guided flying tours, see www.airjourney.com.



Digital Autopilot Basics

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to CULUL as shown on both screens. Note that sequencing is suspended, as shown by the magenta SUSP next to the magenta GPS. On the right, the approach legs are shown including two of the online waypoints before the FAF; ZUBUD and FONTS. Note on this screen that the MYV ILS frequency (110.50) has been automatically entered into Standby. Now is the time to switch it to Active, and select the ILS CRS of 141 degrees.

Although sequencing is now suspended, after being vectored to within a 45-degree cone of the final approach course, sequencing will automatically be restored. During the vectoring process, preselect the assigned altitudes and use VS to climb or descend to those altitudes. As you’re being vectored



FIGURE 3. ON THE MISSED APPROACH AT KMYV (LEFT) AFTER VECTORS TO THE ILS 14 HAS BEEN ADDED TO THE FLIGHT PLAN (RIGHT).

around in HDG mode, arm the APR mode as you’re joining the final approach course. Now, with auto switching on the 750, the CDI will change from GPS to VLOC on entering final. When the APR mode becomes active, the GS is armed

and you’ll intercept it and track the LOC inbound in those modes.

These procedures demonstrate the utility of a modern digital autopilot. They significantly reduce pilot workload

at a time when communicating, evaluating weather and planning options, are extremely important to the safety of flight.

*Dr. Thomassen has a PhD from Stanford and had a career in teaching (MIT, Stanford, UC Berkeley) and research in fusion energy (National Labs at Los Alamos and Livermore). He has been flying for 61 years, has the Wright Brothers Master Pilot Award, and is a current CFII. See his website (www.avionicswest.com) for his latest manual, *Aviating and Aviation in the Modern World*, describing the increased GPS capabilities from a series of new technologies that have been introduced in recent years including AHRS, air data computers, magnetometers, digital autopilots, and more.*





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