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Garmin Rolls Out
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A Guide to the
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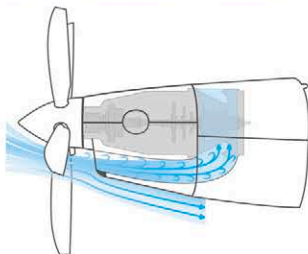


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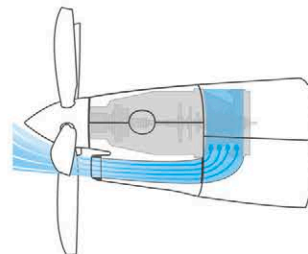
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Pressure from high-velocity ram air is fully recovered at the cowl inlet and flows efficiently through the ducting to the engine plenum. This significantly increases ram air recovery to the engine plenum.

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Pilatus PC-24

Photo Courtesy of Pilatus Aircraft

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for free www.twinandturbine.com

Editor's Briefing

by Rebecca Groom Jacobs



Confessions of an Old Grouchy Aviation Skeptic



The following is guest editorial by my father Randy Groom, an industry veteran and owner-pilot.

2020 marks the 40th year since I left college and joined the general aviation industry at Beechcraft in Wichita. In those 40 years, I have watched with amazement as new designs and new airframe companies attempted, and in some cases, succeeded in entering the marketplace. I thought it might be interesting as we enter this new decade to reflect on some of those failures and successes and contrast them with some of the latest developments on the board for the future.

The first design that comes to mind (probably no surprise) is the Starship, which was announced early in my career at Beech. I was incredibly proud and excited to see Beech “reach for the stars” with a futuristic design to replace the venerable King Air. I was convinced at the time that we had a winner on our hands. Seven years later, I had moved to a Beechcraft dealer and we picked up our first Starship – serial number 10. I felt “super cool” flying the airplane, but the performance and reliability fell far short of expectations and ended up being an enormous business failure.

I think it is important to point out that just because a new product becomes a business failure doesn't necessarily mean that the aircraft was a bad airplane. The later serial number Starships proved to be more reliable and better

performers, but by that time the negative reputation was impossible to overcome.

During the 1990s, the Very Light Jet (VLJ) “craze” was in full swing with at least a dozen different companies, many of which were startups, were being designed, the most notable being the Eclipse. There was incredible hype that the “skies would darken” with VLJ's with Eclipse being the leader. I was a skeptic of Eclipse's ability to pull this off, particularly at their announced initial price close to that of a Beech Baron. One after one, most of these startup VLJ companies closed their doors, draining the pocketbooks of many deposit holders and investors, creating a tidal wave of new aviation skeptics. Eclipse certified and delivered several hundred airplanes before going bankrupt and allegedly burning through a billion dollars. Again, a colossal business failure, but I am told by one of my hangar neighbors that his late production Eclipse is a great airplane, quite fast and efficient.

Also, during the 1990s, a number of single-engine turboprops were under development and as a King Air salesman I went into high gear of skepticism. Who in the world would want a turbine airplane with one engine? Oops, I really

missed the mark on that one. Particularly with the PC-12, which clearly inflicted some damage on our B200 sales.

And then there was the Cirrus phenomenon. Once again, as a Bonanza salesman, I thought, who in the world would want to buy a fixed-gear “plastic” airplane from an unknown start-up company? After all, hadn’t just about all the other startups that I had ever heard about vanished into vapor? Oops, missed the mark again. Cirrus tore into the marketplace with strong marketing, a very credible product and continuous refinement. And now they have a jet that will capitalize on a large, loyal installed base of SR22 owners and will likely become the most popular VLJ ever.

So now we enter into a new decade with lots of new designs on the boards and me, an almost retired grouchy aviation skeptic. As I have confessed, I haven’t always been perfect at predicting success or failure in this industry, but here goes:

Flying Cars – In my simple mind, cars and airplanes have very different structural requirements, so if we are talking about an airplane that flies in, folds up and becomes a car on our highways, I can’t see it.

Electric Airplanes – It would be great to have an airplane that was economical and had a low carbon footprint. Today’s battery technology is such that none of those airplanes would likely have the range to satisfy most private owners. However, flight schools where the missions only require an hour or so of endurance are a great application until such time that the technology advances.

Vertical Takeoff and Landing Drones (Ride Share Use) – This arena reminds me of the VLJ days of the 1990s. There are a ton of start-ups, most of which I predict will disappear into the vapor. Again, electric powerplants will likely limit capability and the regulatory hurdles for airspace and passenger carrying will likely take many years to sort out. However, I think these machines will likely prove their capability in the short-haul cargo arena before passengers ever step into an aircraft with no pilot.

Supersonic Business Jets – Maybe someday. But I will likely be in a retirement home still not able to wrap my mind around the cost to accomplish such an ambitious project.

In short, I hope I am wrong. In my lifetime, there are amazing accomplishments and advances in technology, efficiency and affordability for general aviation. We need it as an industry to excite and attract young people into our industry. And if we do, this old skeptic will smile ear to ear. **T&T**



Randy Groom is president of his consulting business *Groom Aviation*. He has held senior leadership positions with *Piedmont Hawthorne Aviation*, *Piper Aircraft* and *Beechcraft* where he served as president. He has 11,000 hours of flight experience and is a proud owner of a *Beechcraft Bonanza* and *Aviat Husky*. Randy can be contacted at randy@groomaviation.com.



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Position Report

by Dianne White



Flying It Forward

For the past 30 or so years, March 8 has been celebrated as International Women in Aviation day, which coincides with the day on which the first woman, Raymonde de Laroche, earned a pilot's license in 1910. The point is highlight and bring awareness to the achievements of women in all aviation career fields over the past century-plus of powered flight. To coincide, Women in Aviation International hold its annual convention each March – this year, it's March 5-7 in Orlando. The event hosts world-class speakers, job fairs, networking events and awards nearly \$1 million in scholarships to women across the entire spectrum of aviation. In addition, there are hundreds of accomplished pilots and leaders walking the convention corridors – all there because they want to mentor the next generation.

Having been in aviation all my life, I'm thankful that I had the ultimate mentor – my mom, who was a pioneering pilot and businesswoman in her own right. Beyond her, I had a few great bosses who mentored me, as well as an incredibly supportive spouse who also has worked in aviation his entire career. As parents of two daughters, we raised them to think nothing is impossible if they are willing to work for it, and no doors have to be closed. As my oldest pursues her Navy wings of gold, she has opportunities ahead that many past generations could only dream of.

I often get asked, was it hard to get your start in aviation? My answer: probably, but I didn't care and didn't let the naysayers get in my way. I knew what I wanted to accomplish and did what it took to get it done. If that meant I had to work harder, show up earlier and leave later, and hold the quality of my work to a higher standard, I just did it.

Not that I wasn't acutely aware of the gender disparity in aviation in the late 1980s and 1990s. As a young professional woman, I clearly remember one particular visit to a major general aviation manufacturer for a meeting and factory tour. I recall walking into the

administrative offices and gaping at “mahogany row” with the wood-paneled offices with male managers on one side and a row of low desks with female secretaries smartly dressed in skirts and suits lined up across from each office door. I could have sworn the year was 1955, not 1995. Except for the secretaries, I didn't see a single skirt in engineering or flight ops. Where were they? Mostly in marketing, PR, interior design. A few were scattered on the manufacturing floor as well.

Today, that mahogany row I encountered is pretty much gone. In that same company, there are numerous women in leadership positions, some running entire divisions of a multi-billion-dollar corporation. Yes, a few dinosaurs still exist, but their time is about as a new generation of leaders emerge who don't see talent, skill and hard work defined along gender lines.

Recently, I had a conversation about this very topic with Tammie Jo Shults, the Southwest Airlines captain who was hailed for successfully landing her Boeing 737 after a catastrophic, uncontained engine failure at altitude caused an explosive decompression. Looking back at her path to the left seat, she said she encountered plenty of obstacles in her pursuit of a naval aviation career. “I had a dad who treated me as an equal to my brothers, so I never geared my aspirations based on my gender. When I got to aviation officers' candidate school, I was shocked, I had never encountered those fences before.”

But while she encountered plenty of “friendly fire,” she too had a great mentor. Navy Captain Rosemary Mariner was in the first class of six women to earn their wings in the U.S. Navy. In addition, she was the first female military pilot to fly a tactical jet and the first to achieve command of an

operational aviation squadron. Lucky for Tammie Jo, she happened to be her skipper during her training. Rosemary sent Tammie Jo and one other female pilot to A-7 Corsair weapons school, which was before women were allowed to fly combat missions. “She saw it coming in the future, and




Raymonde de Laroche, the first woman to earn a pilot's license (1910).

whether it was to prepare us or to show everyone that it's doable, she wanted us to go."

It wasn't easy. "The first few nights, the guys took off on us, so we ate our dinner out of the vending machine at the airport. But it backfired on them because we had nothing to do but chair-fly our bombing pattern, so we ended up ranked No. 1 and No. 2."

Unhappy that they stood at the top of the leaderboard, the men in charge took away their bullets and bombs. Tammie Jo called Rosemary telling her, "I know you paid for bombs, and we're flying the bombing pattern without bombs or bullets because they weren't happy that we scored at the top of the board." Rosemary was able to get the bombs reinstated but not their bullets.

That was the 1980s and Tammie Jo is quick to point out much has changed. "Whether it's engineering, being a mechanic or flying, the doors are open now like they have never been open in history – both in civilian as well as military worlds. If you want to do it, there's no reason not to."

Then with a twinkle in her eye and a smile, she added, "Flying isn't a gender thing – after all, it is just piloting." 

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.

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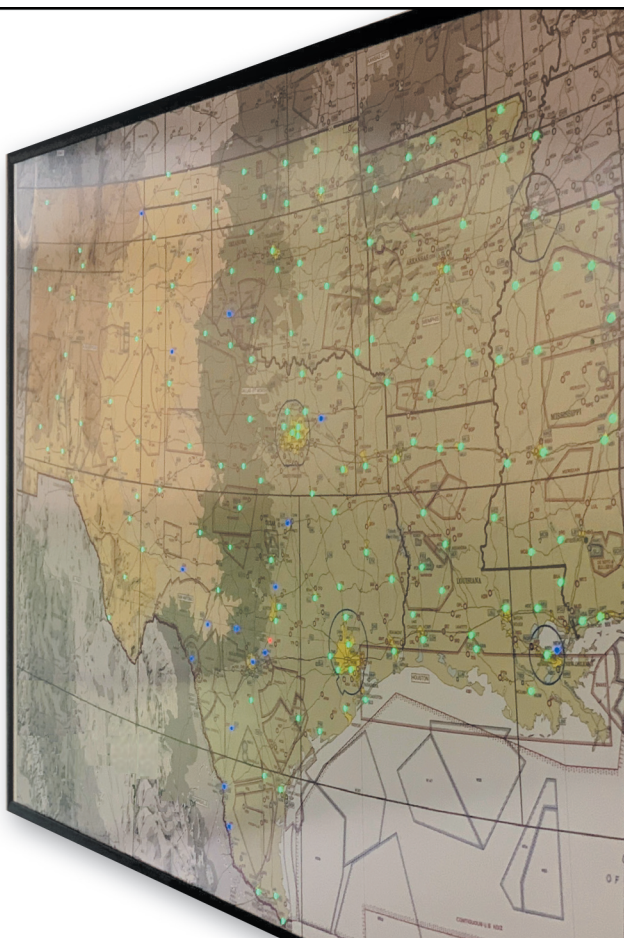
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Garmin Rolls Out

GTN Xi Series: Fourth Generation

by Rich Pickett



GARMIN GTN 650Xi AND GTN 750Xi.

PHOTOS COURTESY OF GARMIN

Garmin International recently announced an updated version of its popular GTN series of GPS/NAV/COMs. Building upon the capabilities of the previous GTNs, they are releasing the new units – named GTN Xi – with higher resolution displays and faster processors. The GTN 650Xi and GTN 750Xi represent the fourth generation of GPS/NAV/COM systems since they released the GNS series. The Xi series is a slide-in replacement for existing GTN installations for those owners that wish to upgrade to the latest technology.

I've flown all of Garmin's avionics systems, and they continue to amaze me with their innovation. When the original GTNs were released, I was one of the first to install the units in my Cirrus SR22. They have continually upgraded the software, which now incorporates features such as user-defined holds, visual approaches and radius-to-fix approaches. Some of these features were previously only available on avionics suites in much larger turbine aircraft.

Prior to the official release of the GTN Xi, I was able to see and work with the units in person and was immediately impressed. The new series incorporates dual-core microprocessors and other updated electronic

components, as well as slight changes in bezel design to complement their TXi flight display units.

When you boot up the GTN Xi, the faster startup time is easily discernible. After startup, the high-resolution display (which was impressive with the original GTNs), renders the map considerably faster and the new processors improve the panning speed. As with their original GTN units, they also support Garmin's Connex technology through their Flight Stream 210 and 510 – allowing wireless sharing of traffic, weather and GPS position, as well as transfer of flight plans with Foreflight and Garmin Pilot. If you have Garmin Pilot, you can also update the GTNs databases through Connex.

The new dual-core processors also enable the overlay of geo-referenced instrument approach charts on the map page. These features are coupled with terrain and obstacle alerting using their internal database. Additionally, the GTN Xi units provide audible alerts, in addition to the visual alerts, including "terrain ahead, pull up" and "obstacle ahead, pull up." For helicopter operators, Garmin offers a Helicopter Terrain Awareness and Warning Systems (HTAWS), as well as TAWS-A and TAWS-B capabilities as

options. The updated hardware also supports Garmin's Telligence voice control when coupled with its GMATM 35C audio panel. These are just some of the new features that will enhance situational awareness and safety.

To ensure the largest number of aircraft can utilize the equipment from the release date, Garmin has received Federal Aviation Administration (FAA) approval and immediate availability for single-engine and multi-engine piston and turbine airplanes, as well as experimental aircraft. They anticipate approval for helicopter and business aircraft to follow in the near future.

The GTN 650Xi has a retail price of \$12,495, and the GTN 750Xi is \$17,995. They are immediately available through their dealer network. **T&T**



With 11,000+ hours of piloting more than 100 aircraft models **Rich Pickett** still has a passion for flying. Rich holds an ATP, CFII SME, SES, glider licenses, and type ratings in the L29, L39, Citation 500/510s/525s, Eclipse 500S and DA10. His company, Personal Wings, provides training, mentoring and aircraft services. He is also a proud owner of an Eclipse and Cirrus SR22. You can contact Rich at rich@personalwings.com.



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Flying to Protect Nature

Conservation flights focus on preserving lands, water and wildlife.

by Grant Boyd



PHOTOS COURTESY OF LIGHTHAWK

General aviation has become an irrefutable asset to businesses and organizations of all sizes, needs and profits. Whether it be manufacturing firms, consulting agencies or law offices, aircraft provide value not obtainable by using other transportation methods – especially when operating in areas of little infrastructure. Aviation's impact is also felt by conservationists, who

are often tasked with monitoring or traversing a large geographic area in a short amount of time on limited budgets.

Conservation Flying

Conservation groups utilize aircraft in several ways when supporting nature-related causes, and LightHawk is the largest of the few volunteer-pilot based conservation organizations in the United States. The group is based

out of Fort Collins, Colorado, with staff and volunteers dispersed across the country. It has assisted in hundreds of projects supporting the protection of wildlands, water and wildlife since its founding in 1979.

What started as a “one-man operation” with a single plane has now become a national conservation group that utilizes 300-plus volunteer pilots. These aviators fly almost 50 twins and

turbines alongside hundreds of single-engines and helicopters in support of a growing mission.

The non-profit's conservation efforts are diverse, with projects falling into three types of self-classifications: Flagship Projects, Strategic Projects and Flights of Opportunity. Flagship Projects are large-scale, multi-year initiatives in which the organization works with many partners toward achieving long-term goals. These projects result in hundreds of flights over several years and address the biggest conservation issues of our age. Examples range from "Restoring the Everglades" to "Conserving the Colorado River" to "Monitoring California Marine Protected Areas" and others.

Flagship Projects

Lee Pagni, LightHawk's foundation relations manager and pilot, speaks about one of the group's key flagship projects and the irreplaceable impact that aviation has had:

"Over the last five years, LightHawk has worked with many of the partners involved in California condor recovery. The very successful captive breeding program often involves moving birds and even eggs from one facility to another for re-pairing to increase genetic diversity or moving juveniles to the field sites to be released to the wild. LightHawk flights have made these transfers much smoother and safer for condors, reducing the likelihood of 'capture myopathy,' a condition caused by excessive stress during transport. In just the last two years, we have transported six adult birds and one egg between breeding centers, and 13 juvenile condors for release to the wild flocks in California. And with radio telemetry antennas mounted on airplanes, these flights also enable biologists from Pinnacles National Park and the Santa Barbara Zoo to locate missing wild birds when they go out of range of the hard-working field crews tracking from the ground. Keeping close tabs on these birds is important for their recovery, as sources of lead in the environment still pose a threat to the species. When scavenging birds, like condors, eat the remains of carcasses shot with lead ammunition,

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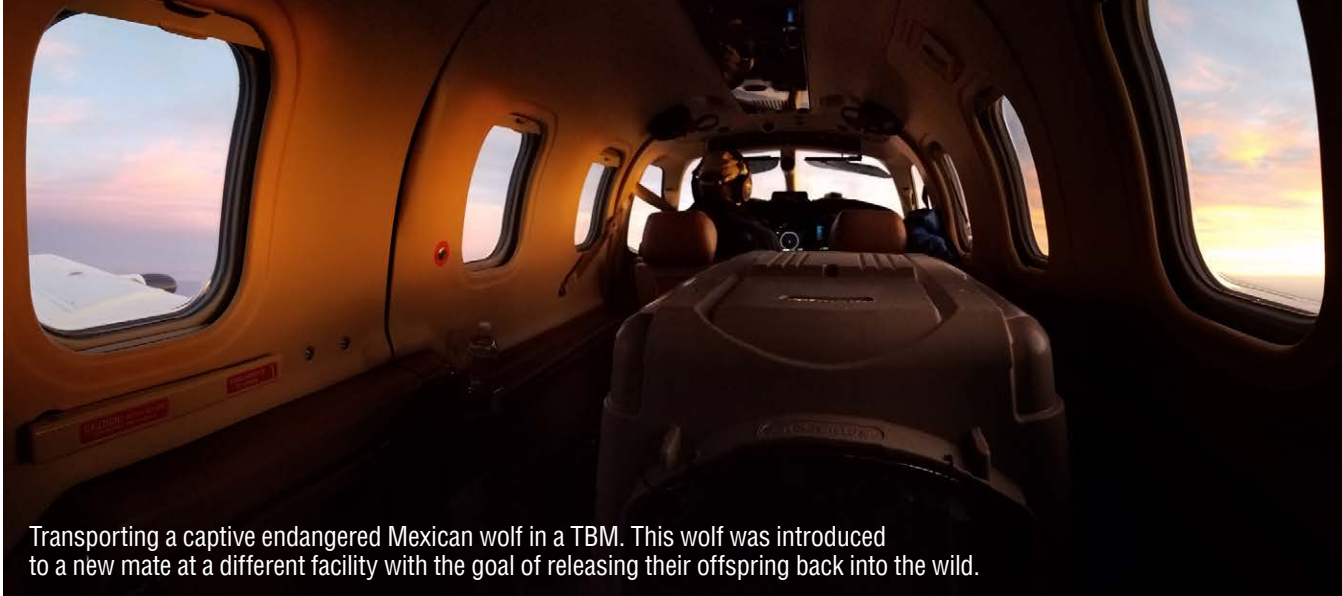
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Transporting a captive endangered Mexican wolf in a TBM. This wolf was introduced to a new mate at a different facility with the goal of releasing their offspring back into the wild.



A group of decision-makers gets a big picture view of protected area continuity in Northern Nevada. The volunteer pilot's Kodiak provided an excellent platform for viewing the landscape while discussing strategies for future land protection.

tiny fragments of the heavy metal can be ingested and then absorbed into their bloodstream, often causing long-term side effects and sometimes even death."

These flagship projects and other missions that the group supports all utilize aircraft in a different way. Further highlighting aviation's invaluable impact is safeguarding the Colorado River.

LightHawk's involvement in a project makes conservation work on the ground far more effective. They educate donors and policymakers at an integrated landscape level in just a few hours. The aerial perspective provides a platform for media that is compelling and unique and allows the group's partners to bring more

attention to the Colorado River than through standard media channels. Policymakers and donors routinely share that the perspective and education they receive during a flight provides observations and understanding they can get nowhere else.

Strategic Partnerships

The organization also classifies some of their projects into "Strategic Partnerships," which are meant to be short term engagements that reach conservation outcomes sooner and involve fewer partners but still require expert planning and a series of flights. Some past and ongoing Strategic Partnerships include Mexican wolf transports, monitoring the Elwha River post-dam removal,

tracking woodpeckers after fires and dozens of others.

Flights of Opportunity

Finally, there are Flights of Opportunity, which consist of only a few flights, but still produce significant results for the organization. The importance of these missions is especially clear during the operations where the organization showcases its conservation efforts to the general public and special guests. Whether it be photographers and journalists who document environmental issues or politicians and decision-makers who help swing environmental reform, the flights over impacted areas highlight the need for continued and proposed conservation efforts.

The Flying

Twin and turbine aircraft find a special place across all of LightHawk's projects, Pagni says, "because of their range and speed profile, they are able to assist with flights that other aircraft cannot." For example, these pilots can assist in over-water whale surveying flights, extended-length transports of larger animals and providing the aerial perspective to a larger number of decision-makers.

In general, the special-mission profile (low, winding tracks often over undeveloped landscapes) of conservation flights may be unique to many pilots, but Pagni notes the organization's heavy involvement in making sure all details are ironed out for the pilots. "Our job [LightHawk and its partners] is to do the

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conservation-related tasks and make sure the pilots are in the loop and set up to succeed. We ensure that the pilot is able to fly their part and make a positive impact on conservation efforts," he expresses.

Aside from the flying portion that is largely planned by LightHawk, pilots can get as heavily or as minimally involved in the actual conversation activities as they like. Alongside the prerequisite of interest in supporting these efforts (no experience necessary), the qualifications needed for pilots are explained further on the organization's website. Prospective pilots must have logged 1,000 hours of PIC time with an excellent flying record, provide two or more references, complete an orientation call with the group's staff, provide a copy of their medical or BasicMed-related information, as well as several others.

How to Volunteer

Once accepted as a volunteer pilot, individuals can fly as much or as little

as they wish. Flight opportunities are emailed to volunteers based upon geographic proximity, but pilots are also able to tell their local program coordinator if they are interested in flights such as long-range animal transports, supporting local land trusts or flying into Mexico with announcements for these missions being sent a select group of parties with capable aircraft.

For those curious about the immediate impact that they can provide upon joining the organization, the following are several current missions in need of assistance:

- Two spring flights into New Brunswick, Canada, to look at land for consideration of future protection.
- Video flight in Ohio to capture oil and gas infrastructure.
- Surveys for migrating eared grebes (a tiny water bird) in the Salton Sea with Oasis Bird Observatory.
- Surveys to monitor restoration efforts in the Colorado River Delta in Mexico with Sonoran Institute.

Whether it be transporting personnel or animals, overflying deserts or mountains, LightHawk coordinates ample opportunities for conservation-minded pilots to donate their time and aircraft in pursuit of ensuring nature's survival. Without aviation, the organization would not be able to provide the impact that they currently have on wildlife, oceans, landscapes and rivers. **T&T**

For more information:
<https://www.lighthawk.org/>

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

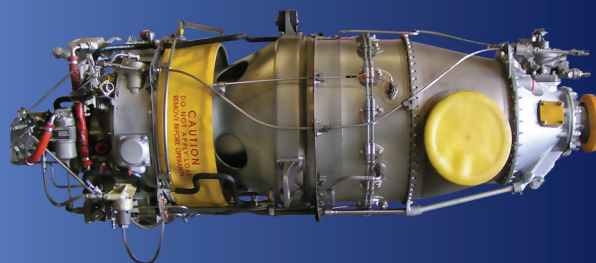
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A Cross-Country Flight and Review of the **Pilatus PC-24**

by **Rich Pickett**

I have been flying the various models of the Pilatus PC-12 since 2006. Whether flying shorter hops or transporting people and supplies for disaster relief, the airplane has shown me amazing versatility. So, when Pilatus announced its PC-24 program and subsequently named it the Super Versatile Jet, I knew it would be a game changer.

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Many people wondered if Pilatus could deliver a business jet capable of taking off on some of the same unimproved strips that their PC-12 utilized. My feeling was if any manufacturer could accomplish this ambitious goal, it would be Pilatus. The company has a proven record of producing a wide range of turboprops, both civilian and military. And in 2018, the PC-24 received certification for dry sand and gravel. That certification recently expanded to grass, wet earth and snow-covered unpaved runways.

With an 18,300 maximum take-off weight (MTOW), a wingspan of nearly 56 feet, length of 55 feet and a tail height of over 17 feet, the PC-24 is impressive on the ramp. In this weight range, the single-pilot certified Pilatus PC-24 joins the Embraer 300E and Cessna Citation CJ4. Overall, the PC-24 is dimensionally larger than both of the others and has an MTOW slightly lower than the 300E and approximately 1,200 pounds higher than the CJ4. With a large cabin of 500 cubic feet, it also fills the market niche between the Embraer 300E and the Cessna Citation Latitude.

The mission specifications for the PC-24 are also impressive. The PC-24 has a service ceiling of 45,000 feet and can carry up to eight passengers and two crew at 0.74M. With four passengers, the PC-24 has an NBAA range of 2,000 nm. If you load the plane with the maximum payload of 2,500 pounds, you can still fly 1,163 nm between fuel stops.

Cross-Country Flight

Earlier this year, a friend and PC-24 owner offered me the opportunity to fly his airplane on a cross-country trip. We were to depart Centennial Colorado airport (KAPA) early in the morning. It would be two passengers, pilots Gilbert Delaud and Kyle Saboda, and myself. With 4,500 pounds of fuel, the plane was at a ramp weight of 17,414 lbs.

After connecting the two ship batteries, we opened the cabin door, an air-stair design with the optional Entry Lighting Upgrade. Directly in front of the wide cabin door opening is a galley that contains



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a sink as well as a lower cabinet that houses the externally-serviceable toilet. To the right is a large cabin with a flat floor and six passenger seats. The PC-24, like its cousin the PC-12, offers a variety of interior configurations, from six-seat executive to a 10-passenger commuter option to medevac. Each configuration is not mutually exclusive, offering the operator to convert the plane into several different forms depending upon the need of the mission.

Of course, my primary interest was the flight deck. I had previously spent time studying the cockpit with Pilatus' Chief Pilot, Jed Johnson, on another PC-24. Pilatus brands their entire cockpit, the Advanced Cockpit Environment (ACE). The cockpit is well designed and the most comfortable I've experienced in this class of aircraft. The seats are even more comfortable than the PC-12, and with my 6 feet and 3 inches in height, I had no issues with leg or headroom.

The PC-24, as with the PC-12 NG,

utilizes the Honeywell Primus Epic avionics suite. Pilatus' latest PC-12 NGX (highlighted in our December 2019 issue), and the PC-24 have implemented the latest Epic version 2.0. Information is presented to the pilots on four 12-inch displays.

There is ample elbow room for the pilots, excellent side and forward visibility, and highly efficient design in everything from the parking brake to the masks to the included power ports and pockets for EFBs. In a similar design to the PC-12, the jet features some of the controls, including the engine start controls, on an overhead panel.

Preflight and Power

The exterior preflight is typical of most turboprops, with verification of control surfaces, clear vents, tires, brakes, and in the case of the PC-24, the single-point refueling system – powered by the two-battery hot battery bus. The PC-24 incorporates dual wheels on each landing gear, equipped with low-pressure tires.

This configuration allows the PC-24 to operate on unimproved airstrips.

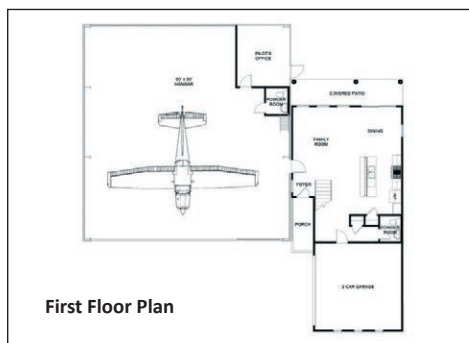
Two Williams International FJ44-4A-QPM turboprops power the PC-24, each with 3,420 pounds of takeoff thrust. Based upon the FJ44-4A, which also powers the CJ4, there are some noteworthy differentiators. The engine features Williams' new Automatic Thrust Reserve (ATR). In the rare situation that thrust from one engine is compromised while at takeoff power, the thrust on the other engine is increased by 5 percent.

During the preflight, you notice the external differences, starting with the inlet designed by Williams, which incorporates additional noise attenuation features. Continuing the inspection, the typical pylon-mounted bleed air cooling inlets are gone, in favor of an integrated bleed air pre-cooler. This design also reduces drag. The PC-24 incorporates Williams' own FADEC and the innovative ground power capability of the FJ44-4A-QPM. Williams' Quiet Power

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Mode, or QPM, allows the operator to run one engine at a lower RPM and fuel flow with the associated noise reduction to serve as an APU. This is especially important at smaller airports or even dirt strips. Williams has calculated the average usage time of QPM in their calculations for inspections, and it does not affect the inspection intervals of 2,500 for a hot section inspection or 5,000 for an overhaul. One of our flights, with the right engine in QPM mode (only the right engine is enabled for this feature), the N2 percentage was reduced from 53.4 to 45.4, fuel flow decreased from 168PPH to 120PPH, along with a noticeable reduction in noise. In QPM mode, the generator has a lower maximum electrical load of 250 amps, more than ample for ground needs.

During the preflight you also notice the upper trailing edge of the nacelle extends past the lower edge. Williams has implemented their patented EX-ACT exhaust nozzle technology on the PC-24. This patented technology takes advantage of the Coanda effect. At relatively low speeds, such as takeoff, the exhaust stays attached on the upper surface of the rear nacelle, which bends it upwards, resulting in three degrees of passive nose-up thrust. At high speeds, such as cruise, the exhaust exits straight and is aligned with the flight path. Ingenious!

Cargo Versatility

With a turn of the handle on the large 4-foot by 1-inch (1.25 m) wide cargo door, it opened to reveal an enormous 90 cubic feet baggage area, easily accessible from the ground or the cabin. This particular PC-24 has the adjustable cargo frame option with a secure curtain, which is required for commercial operations to preclude direct access by passengers in flight. It can be removed for alternative loading options. While this PC-24 is only flown under Part 91, it was useful as a way to organize the luggage while providing access in flight.

The capabilities of Pilatus' cargo flexibility were a key factor on my past PC-12 relief flights, enabling me

to load a donated X-ray machine with a forklift at Fort Lauderdale Executive (KFKE), and three hours later, unload it in Port-au-Prince, Haiti. With the additional speed of the PC-24, you can easily understand why it could be very useful in carrying cargo. Operators can quickly turn the aircraft into a variety of configurations (including medevac), supporting medical and relief services in remote areas of the world.

Once loaded and secured, it was time for our first leg. The PC-24 has a range up to 2,106 nm, however, we were stopping in Texas on our way to Florida. The flight plan distance was 750 nm and we planned on using 2,700 pounds of fuel on the two-hour flight. The weight and balance loading graph showed us well within the envelope. The PC-24 has a broad loading envelope, which is extremely useful when operating with a variety of configurations.

Front Office

The avionics are extremely powerful, featuring a sophisticated integrated checklist system, complete with context-sensitive graphics. These system graphics appear as you proceed through the various checklists. Kyle and Gilbert were flying our first leg, allowing me the opportunity to observe the process. With the pre-start checklist complete, it was time to start our engines.

Battery voltages are checked. The thrust levers are confirmed at idle position, then the engine control was turned to "Run." After verifying the fuel pump is operating, you simply push the "Start" button.

We didn't need QPM mode this morning, so after waiting for the battery charge to drop below 150 amps, the left engine was started. The checklists are designed to minimize pilot workload, especially when flying single-pilot. The checklist items are grouped to ensure that only a few items need to be checked during Taxi, Before Departure and upon line-up. Even the ice protection check is simple. If anticipating icing conditions

Pilatus PC-24 continued on page 22.



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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+
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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
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20	FALCON 100
19	FALCON 200
196	FALCON 2000
22	FALCON 2000EX
56	FALCON 20C
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2	FALCON 20D-5
31	FALCON 20E
9	FALCON 20E-5
65	FALCON 20F
58	FALCON 20F-5
178	FALCON 50
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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
462	PILATUS PC-12/45
108	PREMIER I
6	SABRELINER 40
17	SABRELINER 40A
3	SABRELINER 40EL
1	SABRELINER 40R
21	SABRELINER 60
17	SABRELINER 60ELXM
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Cargo

A wide cargo door reveals 90 cubic feet of baggage area, easily accessible from the ground or the cabin.



Cabin

The flat floor in the cabin can be advantageous over drop-aisle designs, especially when changing seating and cargo configurations. Each passenger seat features quick-change capability enabling its quick addition or removal.

on departure, the checklist advises a 15-second delay at 60 percent N1 while in position. The IPS can be either operated in AUTO mode (with ice detectors), NAI or MAN (manual) modes. In AUTO, the PC-24 utilizes a number of sensors to determine when to activate the various systems, including the bleed-air heating on the engine inlet and wings, as well as the pneumatic de-ice boots on the stabilizer.

Climbing out of Centennial, our V₁ was 93 KIAS and V_r 93 KIAS. At our elevation of 5,885 ft MSL, our takeoff distance was 3,219 feet at -3 degrees Celsius. The PC-24 was designed to have a very high pitch angle of 20 to 30 degrees on takeoff for obstacle clearance and noise reduction. Kyle and Gilbert elected to reduce it to a more manageable 10 to 15 degrees for better visibility over the nose and passenger comfort. The climb profile is 250 KIAS transitioning to 0.70 Mach. We were quickly at a cruise altitude of FL430 (below the maximum operating altitude of 45,000 feet). The cockpit is very quiet, with a noise level of 76-78 dB in cruise.

Cabin Comfort

The flat floor in the cabin is a distinct advantage over drop-aisle designs, especially when changing seating and cargo configurations. The seats are highly adjustable and offer the ability to rotate and facilitate cross-aisle communication. Cabin lighting is fully adjustable, with beautiful overhead upwash as well as downwash side panel LED lights. This PC-24 is also equipped with the optional Integrated Cabin Management System (iCMS). In addition to an 800 GB media server for passenger entertainment, it also features control of the cabin environment, including lighting and temperature using a smart device. This control is provided through a cabin Wi-Fi router. When coupled with various communications options, passengers can truly be connected anywhere in the world.

In the PC-24, as with their PC-12, the standard toilet is placed forward between the cockpit and cabin. To use the flushing toilet, doors on either

Pilatus PC-24 – By the Numbers

Max Speed*

440 KTAS / 427 KTAS / 392 KTAS
FL280 / FL350 / FL450

Fuel Flow Max Speed*

1938 PPH / 1445 PPH / 940 PPH
FL280 / FL350 / FL450

Maximum Range

(LRC, NBAA IFR Reserves)
2,106 NM

Max Ramp Wgt

18,400 lbs

MTOW (SL, ISA)

18,300 lbs

Basic Operating Wgt***

11,720 lbs

Useful Load

6,880 lbs

Fuel Capacity

5,964 lbs

Max Fuel Payload**

715 lbs

Base Price

\$10,700,000

As Flown

\$11,800,000

Typically Equipped (2020 Deliveries)

\$11,134,960

*Weight 17,000 lbs

**Based on Max Ramp Wgt, one pilot

***Standard Exec. Configuration, one pilot

end are extended for privacy, and a button is pressed to slide the seat forward. With the standard sink, it is a very useful design. One advantage of a forward toilet is it doesn't impact the cargo area or the use of multiple configurations.

We are cruising at 0.730 Mach to Texas. After takeoff, Kyle activated the autothrottles, which can manage the power through either FMS or manual modes. In FMS mode, the speed control is based upon the phase of flight. In manual mode, the pilot sets the desired speed. In some situations, such as mountain wave activity, it is preferred to set a specific speed slightly below V_{mo}/M_{mo} using the manual speed control to avoid occasional speed exceedances.

Flying the PC-24

On our second leg, I took the controls under the guidance of Gilbert. After completing the checklists and starting the engines, it was time to taxi. It is very easy to maneuver

despite its size. After receiving the clearance limit times for departure at the uncontrolled airport, I lined up the PC-24 on the runway and moved the throttles to full power. At takeoff power, the plane accelerated quickly, with the callouts and rotation occurring in short order. The specifications state the maximum rate of climb is 4,000 FPM at MTOW, however, that is definitely a conservative number. Immediately after takeoff, I reduced power, lowered the nose for better visibility and watched the ground go by fast. With a relatively low initial altitude restriction, further reduction of power was necessary to keep below 250 KIAS.

I hand flew the airplane for a while and found it a dream to fly. The cockpit visibility is great with no limitations. After stabilizing the power and climb profile, I activated the autothrottles in FMS mode for the initial phase of our trip. In cruise, I selected the manual mode to set a

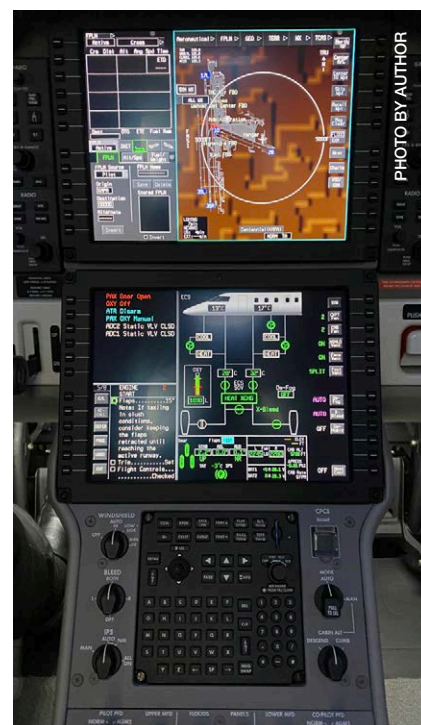


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The center console with the MFD and aircraft system synoptic on the lower display.

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Single-point refueling access.

particular airspeed just below M_{mo} . We were doing slightly better than the performance charts. At FL410, burning 1080 PPH, our true airspeed was 420 knots/0.735M.

I've flown and taught a wide variety of avionics, and the Honeywell EPIC may not be the easiest to learn, but once you have mastered it, you realize the capabilities of the robust system. The Honeywell SmartView Synthetic Vision System (standard) is one of the best I've seen with a very intuitive set of flight path markers. The PC-24 ACE cockpit also features AHRS and one Inertial Reference System as standard, which is a unique offering in this class of aircraft. Additionally, this PC-24 was equipped with a number of avionics options including ADS-B In as well as TCAS-II, Pilatus' Wireless Connected Flight Deck, and others.

After a very smooth flight, evaluating all of the systems in a very comfortable cockpit, it was time to

descend. With the autothrottles and FMS automation, it was easy for us to prepare for landing. Our approach speeds were set, with V_{app} at 105 KIAS and V_{ref} at 95 KIAS. The dual-wheel trailing link gear design makes for very smooth landings.

Summary

The Pilatus PC-24 is a great aircraft, capable of flying the widest variety of missions of any business jet to an array of landing spots with comfort and speed. The airplane can cruise up to 440 KTAS and land at less than 100 KTAS. The PC-24 comes standard with a 7-year/5,000-hour airframe warranty, two years on the avionics, and five years/2,000 hours on the engines. Pilatus offers a broad selection of options, from avionics to interiors, to fit virtually any transportation need. If you ordered a PC-24 now, the base price is \$10.7 million with typical aircraft priced around \$11.2 million.



With 11,000+ hours of piloting more than 100 aircraft model **Rich Pickett** still has a passion for flying. Rich holds an ATP, CFII SME, SES, glider licenses, and type ratings in the L29, L39, Citation 500/510s/525s, Eclipse 500S and DA10. His company, Personal Wings, provides training, mentoring and aircraft services. He is also a proud owner of an Eclipse and Cirrus SR22. You can contact Rich at rich@personalwings.com.

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Five on the Fly

by Rebecca Groom Jacobs



PHOTOS COURTESY OF PILATUS AIRCRAFT



WHO:
Jed Johnson

COMPANY:
Pilatus Aircraft

POSITION:
Chief Pilot

HOME BASE:
KBJC

RATINGS:
FATP, CFII, MEI

HOURS:
11,300

1. Can you summarize your aviation background?

My father got me exposed to aviation. He worked with VanDusen, AAR and Duncan Aviation, so we traveled in GA aircraft a lot when I was growing up. I followed a non-military path through flight instruction, corporate and 135 freight before joining Pilatus at the end of 1996. I was with Pilatus until 2000 when I went to one of our dealers as a salesman for 12 years, flying my own demos, mentoring new owners, doing maintenance flights, etc. After 12 years in that role, and well over 100 turbine transactions, I rejoined Pilatus in 2012. Being a part of entry into service for two new aircraft models and growing the presence of Pilatus in North and South America has been a unique and rewarding challenge.

2. Describe your role at Pilatus Aircraft and what a typical day looks like.

In Pilatus Flight Operations, we touch almost every part of the business. Much of our day revolves around the cadence of production flight test, although we can find ourselves waking up anywhere in North or South America or even Europe. Once an aircraft is completed, we then work through test cards to check every system and function of the aircraft on the ground and in the air. The goal is

always ZERO mechanical and cosmetic squawks at delivery. We also do some experimental flight test related to STCs the company is developing, and occasionally ferry flights between Switzerland and the U.S. In addition, we are involved in marketing, bringing aircraft to trade shows, attending industry meetings, flying air to air photo missions and speaking at user groups as a subject matter experts introducing updates and new products.

We are also demo pilots, whether it be to our direct fleet and military customers or potentially to prospects our dealer network is exposing to the aircraft. We interface with the end customers on a regular basis during the specification process to help them tailor the aircraft equipment to their specific needs. At the delivery, we then conduct an acceptance flight and help get them up to speed on all the details related to operating their new aircraft. On the technical side, we interface with our customer service group to help answer operational questions, and we are involved in future programs on aircraft and aircraft systems as well as training/simulation development and audit. Our business is a relationship business, and our pilots are often the face of our company when we travel, so we take our role as ambassadors for the Pilatus family very seriously.

3. From a piloting perspective, what are your favorite features about the PC-12? The PC-24?

Both aircraft share the same DNA to fit a sweet spot in the marketplace. The value proposition is cabin size/range/payload for the money to purchase/operate. The short and unpaved runway capabilities along with the standard cargo door are the icing on the cake. The best feature is versatility – both machines can do a lot of things very well. Couple that with the quality of construction and customer support, and that is our formula for success. Showing up at airports with short and or austere runways with a turbine aircraft is all part of the fun.

4. How does it feel at the controls of a jet (PC-24) "off-road?" Can you describe one of the most challenging airports you have landed?

We just recently had a PC-24 customer delivery from Denver put their aircraft in service in Alaska as an air ambulance. This machine will have a steady diet of gravel runway operations. One of our teams was on site with their pilots for entry into service and familiarization training

to get their crew dialed in. The feedback was great; the aircraft performance is not much different than operation of paved runways and the customer is thrilled! We have been into some very challenging "private/ranch" customer runways as well as short runways all over the Americas. The PC-24 demands accurate planning and precision in flying it to utilize these types of challenging runways, but our engineers have provided fantastic tools to make sure we operate safely with appropriate margins. The PC-24, however, does what we say it can do!

5. What upgrades can owner-pilots most appreciate in the recently unveiled PC-12 NGX?

The NGX is a comprehensive upgrade to a proven design. The FADEC controlled PT6E-67XP is a big part of the story. Engine management is greatly simplified and it provides 100 more horsepower at altitude, improving climb and cruise speed. With this engine management change, it allows for an autothrottle option, automated emergency descent mode and the ability to drop the propeller RPM from 1700 rpm to 1550 rpm, which makes for a quieter cabin. Maintenance intervals and costs are also reduced on NGX. The normal interval is now 600 hours/12 months for inspections and the engine TBO increases from 3,500 hours with an HSI at 2,000 to 5,000 hours with HSI on condition. The engine sends out around 100 monitored parameters wirelessly after each flight and Pratt & Whitney has put a new program in place to cover virtually every contingency of the engine for a cost that is around 30 percent less than what they currently offer.

Also, the fuel system update no longer requires us to add Prist. The avionics have been upgraded to include a larger Modular Avionics Unit and more powerful Advanced Graphic Modules. This upgrade allows many features on the -24 to be brought to the -12 such as datalink AFIS/ACARS/ worldwide weather, PM-CPCLC, ADS-B In to include surface traffic on a 2D airport moving map, built-in electronic checklists to that have abnormal checklists actively cued to the CAS messages, emergency descent mode, RAAS and TCAS II with resolution advisories, pilot modifiable visual approaches, just to name a few. The cabin has also been redesigned with larger windows, new quick-release executive seats that fully berth, redesigned VCCS that moves more air more quietly, with more adjustability and more modern indirect lighting. The NGX is a host of individual updates to the aircraft that together make it a substantial upgrade. **T&T**

A Guide to the Citation 560XL Series: Part 2

ADS-B vs. ADS-B + LPV vs. Garmin G5000 Upgrade

by Kandi Spangler



PHOTO COURTESY OF GARMIN

Let's face it – it's not an easy decision. Do you spend \$130,000 to simply keep your airplane in the air? Spend \$300,000 to make it legal and give yourself greater access? Or spend \$500,000 and give your airplane a complete avionics facelift, extending its useful life for many years? To answer that

question, let's first look at each option in greater detail.

Option 1: ADS-B Compliance

At a minimum, as of January 1, 2020, all jet aircraft need to be equipped with Automatic Dependent Surveillance-Broadcast

(ADS-B). The cost to equip your aircraft with ADS-B can vary widely depending upon the equipment you currently have installed, but can range anywhere from \$80,000 to \$300,000. Now that ADS-B is mandatory, what you'll find is the investment doesn't necessarily translate into increased value; it simply means



The cost of upgrades like ADS-B and LPV depend on a number of variables specific to your aircraft, but two of the most often considered are the type of Flight Management System (FMS) installed and the model of Radio Management Units (RMUs).

you have a legally equipped airplane. Now, I know that's a big price range. "Why the big variation in cost?" you ask? Well, it depends on a number of variables specific to your aircraft, but two most often considered are the type of Flight Management System (FMS) installed (Honeywell or Universal), and the model of Radio Management Units (RMUs) installed. Generally speaking, the upgrade is more expensive with a Honeywell FMS-equipped airplane.

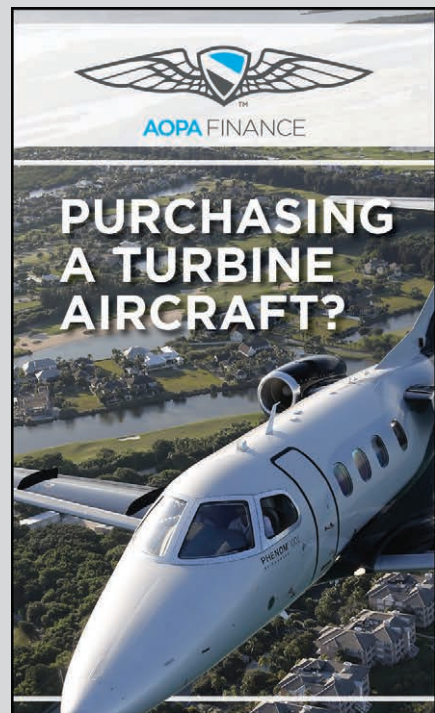
Option 2: ADS-B Compliance with LPV Capabilities

So, you're in the shop for the ADS-B work; why not take it a little further and get something more than just basic legality during the upgrade, like LPV approach-capability? Localized Performance with Vertical Guidance approaches, or "LPV," allows aircraft to descend to lower minimums at airports with precision GPS approaches. In bad weather, this can mean getting you to your intended destination more often than diverting to an alternate airport and waiting the weather out, or worse, driving to your final destination. This can have a major impact depending on how the aircraft is being used and to what airports the aircraft is typically

flying. It's an upgrade worth exploring, but not available to everyone. For instance, if you are operating a Primus 1000 avionics system, which is standard on the Citation Excel and XLS, and equipped with a Honeywell FMS, the option to incorporate LPV capabilities may be cost-prohibitive. For those equipped with the Universal FMS, this option should cost roughly \$300,000, which includes ADS-B compliance depending on the status/version of other installed equipment. In the end, this option not only makes the airplane legal, but it gives you greater access to your desired destinations, and as a real bonus, increases the value of your airplane.

Option 3: Garmin G5000 Upgrade

As they say, "go big or go home" – and this is big. Garmin's state-of-the-art G5000 integrated flight deck upgrade, available on the entire XL series, received FAA STC approval in mid-2019. Not only does this upgrade accomplish all your ADS-B requirements, it replaces nearly your entire Primus 1000 avionics system with a new panel. Garmin claims the upgrade will not only deliver a "truly modernized integrated cockpit," but will give customers a "zero-time avionics suite that will substantially lower



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Garmin's G5000 integrated flight deck upgrade, available on the entire XL series, received FAA STC approval in mid-2019.

cost of operation, while also solving a broad range of global airspace modernization initiatives and on-going maintenance challenges." I tend to agree with them. In my opinion, this upgrade is going to revitalize the fleet, extending the life of this reliable and versatile mid-size cabin workhorse for many years

While different maintenance facilities offering the STC upgrade are quoting installation costs anywhere in the high \$400,000 to mid-\$500,000 range, be sure to read the fine print and get a quote for your specific airplane. There are also many additional options you can include as part of the upgrade, including Flight Stream 510, SurfaceWatch, synthetic vision, underspeed protection, FANS compliance and ChartView. Want to save a few extra dollars? Find an aircraft that already has ADS-B installed using the Garmin GTX 3000 smart transponder STC and the shop will likely give you a credit towards your G5000 installation.

What Should You Do

Well, I'm actually really good at spending other people's money. In fact, it's what I do for a living, and that's why my longtime clients keep coming back. I treat their money like it's my money, and I'm always looking for what's going to maximize their return. So, here's my opinion, but keep in mind, it's just an opinion.

ALL Excels and XLSs have a lot of life left in them, even those with high time. Consider for a moment the average person doesn't ask (or care) how much time is on an airframe when they climb aboard for a flight. What they DO care about is the aesthetics, creature comforts (like WiFi) and age of the airplane. This is especially true for airplanes used for charter. Furthermore, you can typically buy a higher-time airframe for much less than a normal or low-time aircraft.

So, then the question becomes one of resale value. How much value

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are you going to gain by spending the money on Options 1, 2 or 3? For Option 1, the answer is virtually nothing, especially as a large majority of the fleet has been ADS-B upgraded. In other words, this is more the norm than the exception. Option 2 is great for just about any XL/XLS owner because you're not only gaining the required ADS-B compliance, you are gaining better access to more destinations. Many owners greatly value (and even require) LPV capabilities. And, while it's hard to say what dollar value we can place on those additional capabilities, the truth is that you appeal to a much larger pool of buyers by having LPV when you go to sell it.

Then there's Option 3. Hands-down, this avionics package will turn your airplane into a state-of-the-art machine with technology that manufacturers are delivering on new aircraft today. Existing owners and buyers of the Excel and XLS are lining up to have the G5000 installed,

and several installations have already been completed with rave reviews. Through reduced avionics maintenance costs, extensively increased capabilities and a weight reduction of nearly 200 lbs (adding to your useful load), you can see why this package is so popular.

Opinions are like... well, you know the joke.

So, where does a G5000 installation make sense? This is where I'm bound to get hate mail, but here's what I tell my clients: I believe you'll get more out of your investment at the time of resale by spending the money to do this upgrade on a mid- or low-time aircraft vs. a high-time aircraft. Mainly because total time on an airframe means a lot more to buyers (i.e., those to whom the plane may be resold one day) than it does to the passengers.

So, if it were my money, my first choice would be to start with a mid- or low-time Excel or XLS and install

the G5000. With this avionics suite, you'll realize tremendous benefits through the latest technology and added capabilities, charter users will love it (if you go that route), and when you decide to sell it, the airplane will sell more quickly and for more money. As a second option, if you plan to use the airplane for charter and don't care about total time, then buy a high-time airplane at a discount, outfit it aesthetically for you and your charter passengers, and install ADS-B with LPV capabilities. If you're going to spend the money on an upgrade, at least get some added value out of it – both operationally and at the time of resale. **T&T**

Kandi Spangler is a sales director at jetAVIVA. She has more than 20 years of aviation experience. You can contact Kandi at kandi.spangler@jetaviva.com or 512-410-0295.



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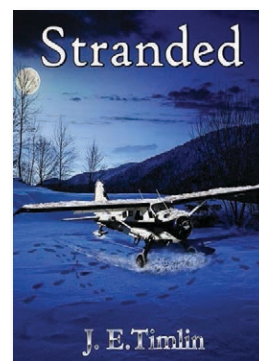
Richard is a training captain with an international airline. His wife, Julie, is a writer. Their ten-year-old daughter, Talitha, dreams of following in her father's footsteps and becoming a pilot one day. Talitha's interest is not surprising as she has an aviator in her family. She sees her dad head off to exotic locations every week, hears stories of different cultures, sees photos of fascinating historical sights. She experiences his passion for his career and she never hears him complain about having to leave for the office.

Talitha's interest got her parents wondering about how children without the same exposure to aviation become interested in the industry. After all, they don't come across pilots in their everyday life the way

they do teachers, doctors, dentists and policemen.

Julie and Richard decided to see if they could make a small contribution towards inspiring the next generation of pilots. So, drawing heavily on her husband's expert knowledge, Julie has written a "Flight of the Phoenix" style adventure novel for children, aged 7-14, about a young aviation enthusiast who finds himself stranded in the Canadian wilderness with a crashed plane which he needs to repair and pilot out.

A book is an easily accessible promotional vehicle, and Julie and Richard hope that the novel may start the wheels of interest turning and offer early exposure to the fascinating world of flight. Just as a child reads a



spy novel and wonders what it would be like to work for the CIA, they hope a young person may read "Stranded" and contemplate becoming a pilot. That it may encourage children to take the next step of visiting an air show or an aviation museum or joining an aviation program or camp where they will get to experience aviation.

Julie's novel, "Stranded," is available from Amazon and major bookstores. A percentage of the proceeds of each sale will be donated to charities that help to make aviation accessible to all juniors. Learn more at www.jetimlin.com.

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From the Flight Deck

by Kevin R. Dingman



Sick of It

Milestones and kidney stones:
Flying with a medical condition.



What major milestones mark the month of March? The 70th anniversary of Silly Putty and the 75th anniversary of the rubber band, of course. After all, what would childhood be without Silly Putty, and would we have pursued aviation if our balsa airplane had no rubber band? The annual celebration of Women's Day was on March 8 as was the beginning of Daylight Saving Time. St. Patrick's Day the 17 and the first day of Spring the 19. And certainly, we're planning on attending the Sun 'n Fun fly-in on the 31. These events all reside in the final third of cold-and-flu season and since words like contagion, pandemic, coronavirus and quarantine have been in our vocabulary as of late, let's talk about flying airplanes while sick. There are a plethora of ailments that disqualify us from acting as a required crewmember, including the kidney stone reference in the subtitle above. We'll get to that, and other painful tales, in a bit.



Cootie

/ˈkoodē/

Noun.

A derogatory term for an imaginary germ or repellent quality transmitted by obnoxious or slovenly people:

"The boys at camp knew the girls had cooties."

The official cold-and-flu season started in late fall (October-ish) and runs about 13 weeks, typically ending by April. This year I was blessed with having no flu, but during a January layover in PVR (Puerto Vallarta), I was infected by a rare international ailment: the painful, virulent and often deadly, Acute Mexican Rhinovirus (AMR). Actually, there's no such thing; it's not rare and it's certainly not deadly. It was just a normal cold, but you know how us guys think we're dying anytime our nose stuffs up or pain reaches level six. But thanks to oversized eustachian tubes and a slow-to-develop fever, it advanced slowly enough for me to finish the trip and return to the good old U.S.A. If you travel enough, you too will encounter sickness while away from home. For those yet to endure being sick-in-a-hotel with the flu, a cold or food poisoning, here is a list of some travel-related cooties we pilots may encounter:

- African Tick-Bite Fever (not related to a fellow Michigander's, Cat Scratch Fever)
- African Trypanosomiasis (Sleeping Sickness)
- Avian Flu (Bird Flu)
- Chagas Disease (American Trypanosomiasis)
- Chikungunya (from the bite of an infected mosquito)
- Cholera (from food or water contaminated with bacterium *Vibrio cholerae*)
- Dengue (a mosquito-borne viral infection)
- Diphtheria (a thick covering in the back of the throat)
- Food Poisoning (enterotoxigenic *Escherichia coli*: "Montezuma's revenge" or "Delhi belly")

Dangerous, Often Disqualifying Diagnosis

I'm not a physician, and I don't play one on TV, but here is another list – this one of the well-known, and typically disqualifying, medical conditions for intrepid aviators:

Angina pectoris – severe pain in the chest

Bipolar disease – extreme mood swings

Cardiac valve replacement – transcatheter aortic valve replacement (TAVR)

Coronary heart disease – that has been symptomatic or clinically significant



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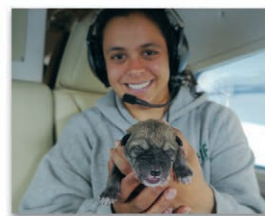
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Left: Chris Crisman/TNC/LightHawk; Right: Lincoln Athas/WCC/LightHawk

Diabetes mellitus – diseases that affect how your body uses blood sugar

Disturbance of consciousness – i.e., blackout or fainting without explanation

Epilepsy – chronic recurrent, unprovoked seizures

Heart replacement

Myocardial infarction – a heart attack

Permanent cardiac pacemaker

Personality disorder – that repeatedly manifested itself by overt acts

Psychosis – thoughts and emotions so impaired that reality is lost

Substance abuse – typically drugs or alcohol

Substance dependence – compulsive drug-seeking (why isn't nicotine included?)

Mega-Corporation Mentality

Other medical conditions may be temporarily disqualifying, such as acute infections, anemia (lack of healthy red blood cells), kidney stones and peptic ulcer (sores in the lining of the stomach, lower esophagus or small intestine). If you've ever wondered if you could fly with a kidney stone, wonder no further. Once in the ureter, the pain will decide for you (see "Kidney Punch," T&T, November 2012). As a DC-10 Flight Engineer, I awoke on the floor of the pilot restroom in L.A. operations having passed out from the pain of what turned out to be a traveling kidney stone. Imagine if the passengers had seen an in-uniform airline pilot being wheeled-out under critical care. Instead of following the EMT protocol of sporting an O2 ensemble and an IV bag while riding in a wheelchair, I walked through the passenger filled terminal to an ambulance. The stone soon completed its trek, and after the requisite tests the next day to confirm the event was over and there would be none to follow, I flew my next trip the day after the tests.

Management never thanked me for avoiding national news by avoiding the wheelchair while writhing in agony,

nor for my returning to flying duties quickly. Instead, the chief pilot chastised me for waiting until so late to call in sick. This corporate mentality was demonstrated again after my aforementioned Puerto Vallarta, Acute Mexican Rhinovirus event. When talking to crew scheduling after the trip with ears blocked and a fever over 100, I was told to "enjoy my time off." If you have a supervisor to whom you report when medically disqualifying yourself for flying duties, there may be friction. Make the right decision as PIC about your condition regardless of external pressures from employers, passengers and perceived time commitments. Here are some guidelines to help make that tough call.

IMSAFE

• Illness

- o Illness can produce fever impairing judgment, memory, alertness and the ability to make calculations. The safest rule is not to fly while suffering from any illness.

• Medication

- o Performance can be degraded by both prescribed and over-the-counter medications. Any medication that depresses the nervous system, such as a sedative, tranquilizer, or antihistamine, can make us more susceptible to hypoxia. The safest rule is not to fly as a crewmember while taking any medication unless approved by the Feds.

• Stress

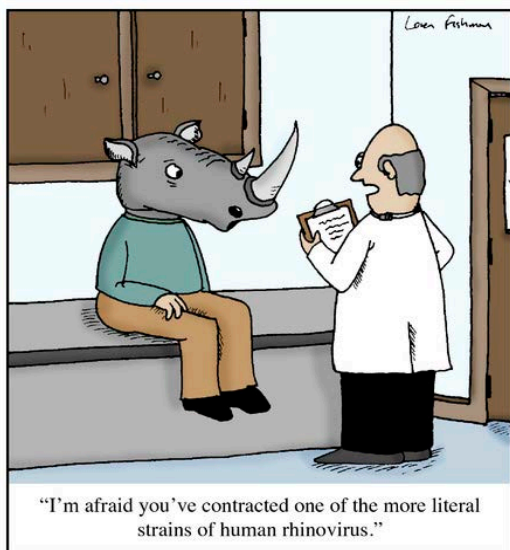
- o Stress and fatigue are a hazardous combination. When more than usual issues are encountered, we should consider delaying our flight until these difficulties are resolved.

• Alcohol

- o As little as one ounce of liquor, one bottle of beer, or four ounces of wine can impair flying skills. Alcohol also renders us more susceptible to disorientation and hypoxia. We may still be under the influence eight hours after drinking a moderate amount of alcohol. A guideline is to allow at least 12 hours between "bottle and throttle."

• Fatigue

- o Acute fatigue is the tiredness felt after long periods of physical and mental strain, including strenuous muscular effort, immobility, heavy mental workload, strong emotional pressure, monotony and lack of sleep. Acute fatigue is prevented by adequate rest and sleep, as well as regular exercise and proper nutrition.
- o Obstructive Sleep Apnea. OSA interrupts normal sleep and is associated with chronic illnesses such as hypertension, heart attack, stroke, obesity and diabetes. If you have a neck size over 17 inches in men or 16 inches in women, or a body mass index greater than 30, you should be evaluated for sleep apnea. A rough estimate of



BMI is weight divided by height in inches – then move the decimal point one to the right. Otherwise, a precise calculator can be found online (www.cdc.gov).

- **Emotion**

- o The emotions of anger, depression and anxiety not only decrease alertness but also may lead to taking risks. Any pilot who experiences an emotionally upsetting event should not fly until recovered.

- **Personal Checklist**

- o We should be conducting preflight checklists on ourselves as well as the airplane. A personal checklist that can be committed to memory, which includes all of the categories of impairment discussed above, is available on the FAA website, www.faa.gov (search "Single-Pilot Crew Resource Management").

14CFR 61.53

Federal Aviation Regulations prohibit a pilot who possesses a current medical certificate from performing crewmember duties while the pilot has a known medical condition or increase of a known medical condition that would make the pilot unable to meet the standards for the medical certificate.

If you were to have your flight physical today, with a cold, the flu, a broken bone, blurry vision, fatigue, fever, anger

or whatever is ailing you, would you pass the physical? This is the question that we're supposed to ask ourselves before each flight. If the answer is maybe or no, then until we believe that we would pass a physical, we are required to "ground" ourselves by temporarily self-invalidating our medical certificate. My AMR was nothing like a coronavirus (SARS-CoV or MERS-CoV), bird flu, hantavirus, or adenovirus and a kidney stone or broken bone are an easy go-no-go decision. A partially blocked ear, low-grade fever, grumpy tummy, anger, frustration or a sleep deficit are more subjective. Remember the adage that it's better to be on the ground wishing you were in the air than in the air wishing you were on the ground. It's not only mechanical issues and the weather that can bring this adage into focus – so can exposure to cooties like the Acute Mexican Rhinovirus.

Listen to an infectious disease podcast at:
<https://threatjournal.com/podcast/DrSteveHatfillInterview.mp3>

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 organization Wings of Mercy, is employed by a major airline, and owns and operates a Beechcraft Duke. Contact Kevin at dingner10d@gmail.com.

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Roundtrip to Wichita at the Speed Of...



// I need to drop my M2 off at the service center in Wichita. Want to fly right seat?" came the voicemail question from friend Larry King. "Oh, and I might buy a 206, so Cessna will take us home on a demo flight back to Dallas," he added.

Now, that might be an interesting trip, I mused. Up to KICT on a 400-knot jet and right back on a single-engine Cessna. What could be more fun?

So, we met shortly after sunrise at Larry's Mesquite, Texas (KHQZ) hangar in low overcast skies and light mist.

The 300 nm trip to KICT was going to be quick with a 75-knot tailwind. ATIS "Victor" was advertising winds at 300 degrees at 18 knots gusting to 25 with a 1.5-mile visibility and 900 overcast. As we taxied to Runway 36, Larry asked, "What's our takeoff alternate?" I was pleased. My mentoring was working. "Well, Dallas Love (KDAL) has lower landing minimums and better approach lighting, so that's probably a better idea than trying to get back in here."

We agreed.

In the 8 degree Celsius temps, we departed with wind-shield bleed air and engine heat on. Climbing at 220 knots IAS and 2,500 fpm, we quickly cleared the tops at 10,000 feet. Larry had filed for FL 400 even for this short flight. We were only there for a few minutes at a comfortable cabin altitude of 7,600 feet, and our numbers were impressive.

TAS 394 knots
GS 446 knots
FF 360 lbs per side

Descending into Wichita at more than 3,000 fpm to meet a crossing restriction, our ground speed increased to 475 knots. We arrived at the Textron service center after 54 minutes, aided by the tailwind, and burned 120 gallons of jet fuel.

That's some performance.

Awaiting us on the ramp was Andrew Pahlke, demo pilot for Cessna's single-engine line. For about 4 million less than the M2, we were headed back to Mesquite in a single-engine Cessna. Only this time, at 5,000 feet. Andrew conducted the safety briefing and noted that the 206 Turbo Stationair HD could carry more than

1,000 pounds of stuff with full fuel. That's better than the M2. And the plane features the latest Garmin G1000 NXi avionics, including Electronic Stability and Protection (ESP) and coupled autopilot go-arounds – features not yet available in the jet.

On takeoff, Larry commented, "Wow, we used so little runway!" We departed to the north and climbed at 900 fpm all the way to 5,000 feet, where our cabin altitude was...5,000 feet. And there we remained in the soup with an outside temperature of 4 degrees Celsius for the entire flight. Our cruise numbers:

TAS 142 knots
GS 135 knots
FF 19 gph

Two hours and sixteen minutes to be exact, even with virtually no headwind. We had lots of time to talk about airplanes and life while never seeing the ground. Finally, we shot the RNAV GPS 36 to Mesquite, where the weather had not changed since we left.

Two very different airplanes flying the same mission. Both were a blast.

Fly safe. **T&T**

David Miller has owned and flown a variety of aircraft from light twins to midsize jets for more than 50 years. With 6,000 plus hours in his logbook, David is the Director of Programs and Safety Education for the Citation Jet Pilot's Safety Foundation. You can contact David at davidmiller1@sbcglobal.net.



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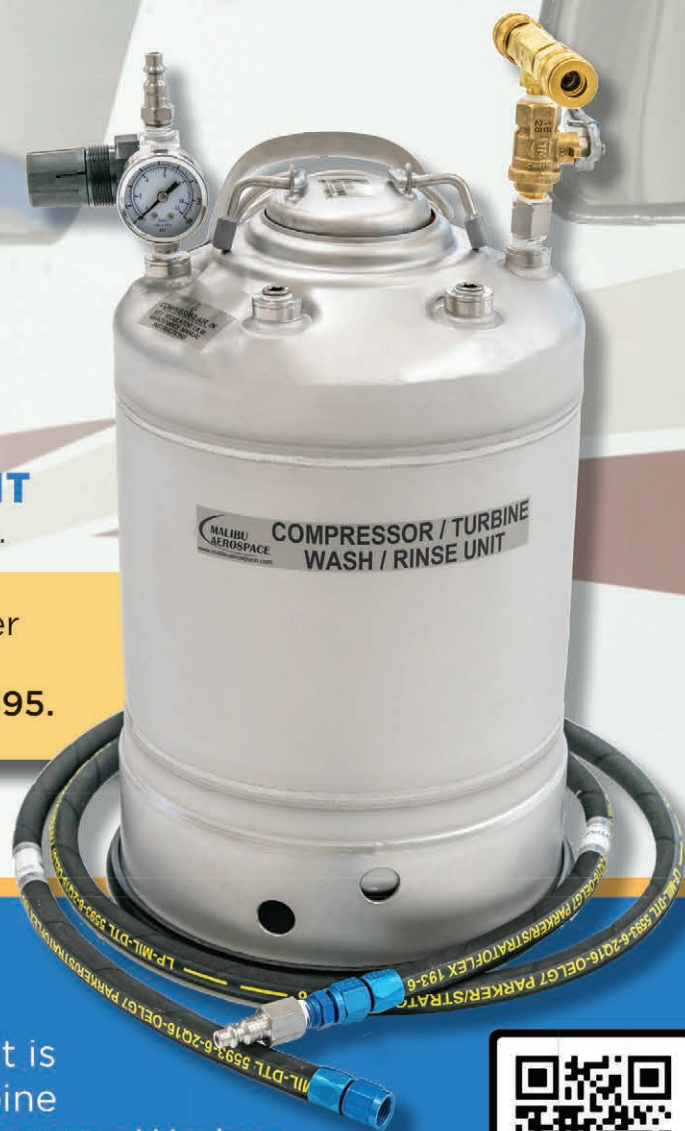
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