Developing a DIY Checklist / Teachings from a Near Midair / Modernization of Air Navigation

TWIN & TURBINE

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

APRIL 2021 $3.95 US
VOLUME 25 NUMBER 4

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Lessons from the Listings

Thank you to the T&T community for the well wishes as Jared and I embark into the world of aircraft ownership. We are almost two months in and still find ourselves visiting the hangar just to be sure an airplane really is in there…

While the process is fresh in our minds, I thought it'd be insightful to share our top takeaways from the search – and based on what we experienced, the owner-flown market is as hot as they say. The following bullets are what we consider the most critical steps to our success from the start of the search to making an offer (August 2020 to February 2021).

- **Build a Team of Support** – Two (or more) minds are better than one. From the get-go, we reached out to friends and contacts who are/were aircraft owners. Jared called and listened to their real-world experiences, explained our mission and aircraft contenders, and asked countless budget and maintenance-related questions. Whenever a listing popped out, it was swiftly forwarded to this "support group" for outside opinions. The added insight (especially in a time-critical market) helped us determine what core items to focus on as well as propose questions we might not consider.

- **Set Up Automatic Search Emails** – In today's market, this is a must. The (good) airplanes are disappearing from online listings in literally hours. We recommend visiting the various online aircraft marketplaces to set up a custom search and enable automatic emails. Check the listings and emails every day and look for additional links to sales organizations' independent websites. Commonly, these companies also offer their own mailing lists.
- **Turn to the Professionals** – Tapping a team of professionals for legal advice/paperwork, insurance estimates, maintenance planning, etc., allowed us to rest easier and move faster knowing the steps are done correctly. Yes, there is an added cost, but we felt it was easily worth the comfort and efficiency, especially due to the added complexity of our co-ownership and the pace of the market. Any time we needed guidance or ran into a roadblock, an experienced professional was just a quick call away.
- **Ask Lots of Questions** – The aircraft search process is basically an endless stream of questions and research – questions to friends, owners, sellers, salespeople, professionals. As soon as Jared viewed a listing of interest, he would send his top four or five questions to the seller regarding the airplane's specific performance and history, forward the listing to our support team, then conduct more online research. But the more you know and learn about the airplane sooner, the fewer surprises there will be later.
- **Forums are Your Friend** – Owner's group forums (ex. Mooneyspace, BeechTalk, MMOPA, etc.) offer invaluable pools of knowledge from hundreds, if not thousands, of experienced owners. This can especially be beneficial on the maintenance side when you need to find specific information related to a make and model down to the year. Or if the airplane you are interested in is located in another region, forums can be a great place to find a

reputable shop to conduct the pre-purchase inspection. Forums also typically have a section with for-sale listings (which is how we found our Bonanza!).

- **Be Ready to Move** – If you think you are remotely interested in buying an airplane, start the research and market monitoring now. Doing as much work as you can ahead of time with financing, insurance, hangar, etc., will let you pull the trigger when you find what you want. As soon as we saw the "one," we had a conditional offer on the airplane within 18 hours. You never know when the right airplane will show up, and it may surprise you. And in all likelihood, if it jumps off the page at you, the same is happening to others.

We want to give special thanks to the following team of people and businesses for their help in our search and buying process: Randy Groom, John Arnold, Brent Hansen, Clemens Aviation, Clemens Insurance (Jerry Clemens), Jerry Brady, Kyle Brady, Partners in Aviation (Mark Malloy), Business Aviation Law Group (Bart Peters), Thomas Turner, and Ryan Reid.

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DIY Checklists

Improving safety and efficiency while learning the airplane.

by **Alex Jones**

PHOTOS BY AUTHOR

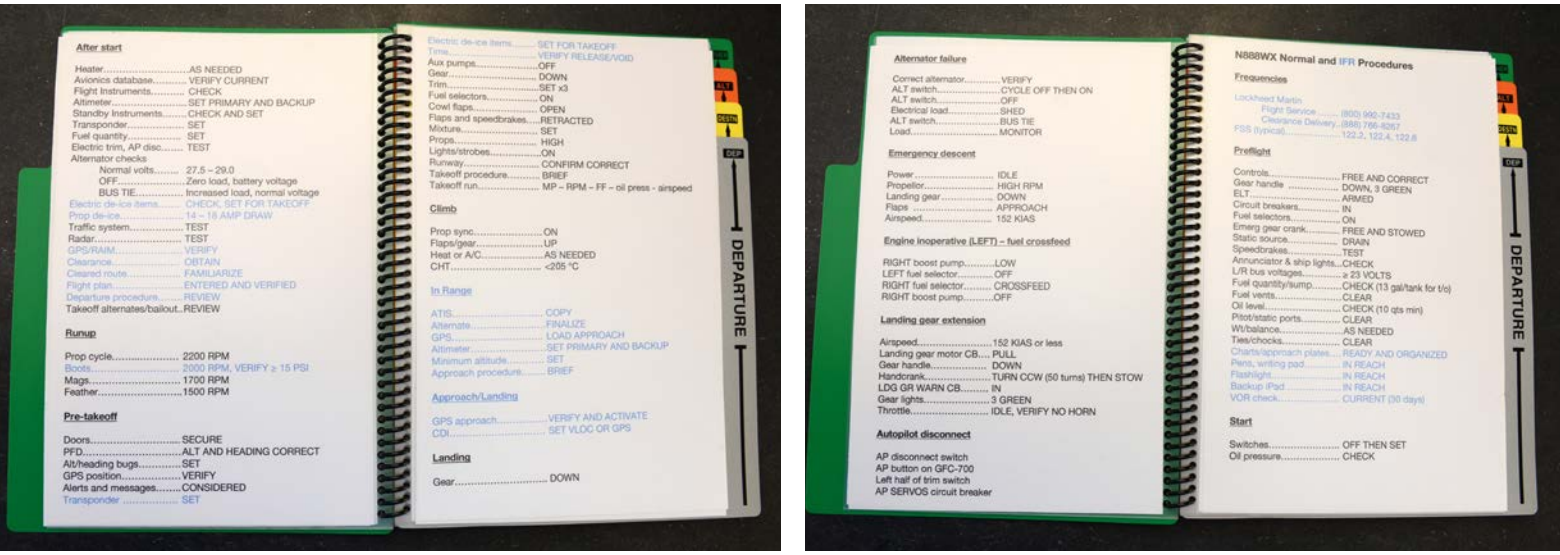
General aviation checklists are often long and contain unnecessary detail. As pilots flying under FAR Part 91, we have the freedom to create our own checklists, and there are some great advantages to doing this. Pilot-created checklists can be shorter, more relevant and better organized than the POH versions. Most importantly, writing a checklist offers a chance to truly get to know the airplane because it requires careful scrutiny of every item in the POH checklist. I wrote my own checklist for my Baron G58 when I bought it in 2015.

Using Flows

First, we should consider how checklists are used. It is less efficient and more time-consuming to use a checklist as a "read-do" list – reading an item, then looking up to check a control or position a switch. I am a firm believer in a "do-verify" type of checklist, also known as a flow. For the initial cockpit check, for example, I start at the top right corner of the control panel and work my way down across the bottom, over the left side, and end up in the throttle quadrant. This way, I can accomplish over a dozen checks and tasks before looking at the checklist to make sure I've done all of them. Because they come in a logical order, I am less likely to miss something and more likely to spot it if I have.

Checklist Construction

My checklist is in an IFR Flight File made by AERO Phoenix (available at many online pilot shops). This holds NACO or Jeppesen-sized paper approach plates in transparent plastic sleeves. It's also lightweight with a durable plastic cover and is easy to tuck between my left leg and the sidewall when not in use. I print out the checklist



Pilot-created checklists have the potential to be shorter, more relevant and better organized than the POH versions.

on a total of eight pages, cut them to size, and place them in the sleeves. These include emergency procedures (two pages), normal procedures (four pages), start conditions (one page), and a weight and balance chart (one page). The font is Helvetica Neue (clean typeface, no serifs) with a 14 point size for headings and 12 point for the lists.

Regulatory Guidance

Flying under Part 91, there is no requirement to use any specific checklist or to use one at all. FAR 91.501 – 91.503 details the requirements for checklist use by operators of heavy or multi-engine turbine aircraft. While not required for us, they are worth reading as an example of when to use checklists and what they should contain.

Safety Alert For Operators (SAFO) 17006 is also important. The FAA urges pilots who are using pilot-written or commercially available off-the-shelf (COTS) checklists to "meticulously compare" these with the POH checklists and aircraft placards. While not binding, this is just good advice.

Shortening and Organizing

This took several detailed trips through the POH checklists and a fair amount of hangar flying. I started by including everything in the POH, then moved items around to where they made more sense, and eliminated others completely. Wherever possible, I grouped items into flows, so I could carry out a series of tasks before looking at the checklist again. These flows form the backbone of the checklist. I also focused specifically on keeping safety-critical items, things I tend to forget, and anything that could improve safety over the POH checklist. Here are a few examples.

For the Baron, the POH places preflight cockpit checks in two places, one before the walk-around and one after. There are several more preflight tasks sprinkled in other checklists, such as the runup checks. I consolidated these tasks to complete almost all of them before the walk-around via the flow I mentioned earlier. Another goal here was to do as much as possible before starting the engines. Minimizing head-down time with props turning on a ramp, in my view, improves safety for those outside the plane. It also saves gas.

Other changes can improve flight safety. I moved the "Controls – free and correct" step from the engine runup to the beginning of the preflight cockpit checks. Any unusual sounds, like a cable or control surface binding, are best heard when the engines are not running, so it makes more sense to perform these checks with the engines off.

As a pilot gains familiarity with an airplane, some items become unnecessary. My engine start checklist is now two items instead of nine in the POH. Some of the dropped items are common sense, such as "Magnetos/start switch – start (release to BOTH when engine starts)." It's a safe bet that all pilots understand this is how to get the engine to start making noise. If they don't, they will remain safely on the ground. The two I kept are "Switches – OFF, THEN SET," and "Oil pressure – CHECK." The first step reminds me to verify the Avionics Master and any battery-draining accessories are off before powering up the Masters, and the second to check the oil pressure after starting – a critical step that is easy to miss.

Starting a cold Continental IO-550 is easy to do with a flow: Masters and alternators on. Mixtures/props/throttles full forward. Cowl flaps open. Boost pump low to check operation, high until fuel flow peaks, then off. Throttles closed, then open half, clear, then start the engine. Verify oil pressure is up before doing anything else. The other start conditions – hot and flood starts, for example – sit on another page, so I don't have to wade through those before running the after-start checks.

The landing checklist is even shorter: "Gear – down," which is the single most important item. I reinforce this with the airline practice of keeping my hand on the gear switch until I see three green lights. A final flow, what I call the over-the-fence checks (completed on short final, about when I cross the airport fence), includes gear down, props forward, and click the autopilot disconnect switch to shut off the yaw damper. I've forgotten that last step more than once; it's hard to move the rudder on the roll-out with the YD engaged. Putting it into this flow solved the problem, as would placing it in an earlier checklist.

Maintaining

This is an iterative process. I didn't bother printing the first few versions on nice paper since I found missing items, poor or inefficient flows, and extra steps, even after many dry runs in the hangar and my home office. Every year, while the plane is in for its annual inspection, I submit the checklists to the same process – I dismantle and inspect them, making whatever changes are needed.

Conclusion

Pilot-made checklists are a great chance to improve efficiency and safety. Even better, it is an opportunity to learn airplane systems in much greater detail because it requires the pilot to consider each item in the POH checklist. Hangar flying is a critical part of creating a checklist. The best way to develop flows is by sitting in the pilot's seat, touching the controls, rehearsing tasks, and taking notes. These flows then become the basis for the revised and improved checklist. T&T

Alex Jones *is a physician and owner-pilot in the Chicago area. He has flown a Baron for the past six years and is currently transitioning to a King Air. You can contact Alex at* **joneshvna@gmail.com**.

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Near-Hit

Teachings from a reader's close call with a midair collision.

by **Thomas P. Turner**

A Twin & Turbine reader recently wrote about a harrowing experience:

I was almost involved in a midair a few weeks ago. I fly an MU-2 and was in IMC on an IFR flight plan, being given descent instructions by ATC into my home airport, Hazelton Regional (KHZL) in Pennsylvania. An aircraft came up on my TCAS [Traffic Collision Avoidance System]. He was VFR and not talking to ATC. He all of a sudden started a descent toward me. I turned. He turned. My TCAS showed our blips overlapping and a "0" for altitude difference. I guess he missed me by 50 feet. I mention this because an article on midairs, VFR flight into IMC, and usage of traffic displays might teach us a lot.

The Midair Record

"A near midair collision is defined as either an incident in which aircraft are less than 500 feet apart or…during which a pilot…feels that a hazard existed," according to AOPA. Half of all midair collisions happen in the airport traffic pattern, AOPA reports. Of these, 80 percent occur during final approach within 400 feet of the ground. The most common scenarios resulting in an airplane collision are:

- Low-wing aircraft converging with a high-wing aircraft
- One aircraft overtaking another
- Collision on final approach at a nontowered airport resulting from loss of situational awareness
- Formation flying and air-to-air photography
- Complacency while en route
- Mistakenly taxing onto an active runway

The MU-2 pilot's scenario may have included some elements from the list above but appears to have been a unique set of circumstances. Virtually all inflight collisions happen in day visual conditions – making the MU-2 pilot's experience very unusual.

The IFR Pilot

The MU-2 pilot was flying a very capable twin turboprop. Given the FAA's stringent special training requirements for flying the type (14 CFR 91 Subpart N) he is likely very well trained and proficient in the Mitsubishi twin.

TCAS is a system usually installed in larger airplanes. ICAO rules require TCAS in aircraft exceeding 12,600 pounds or authorized to carry more than 19 passengers. There is no TCAS requirement for aircraft operated under U.S. Part 91, while Part 135 requires it in airplanes with 10 or more seats. The MU-2 does not meet any of the conditions requiring TCAS, but it certainly could have been voluntarily installed.

TCAS was revolutionary when it first became available. But traffic avoidance systems like the almost-universally required ADS-B have caught up with all but the most advanced TCAS feature: the Resolution Advisory (RA). RA not only warns of an imminent collision threat but also gives the pilot audible instructions for avoiding it – directing a climb, turn or descent to avoid the conflicting aircraft. If an RA warning is given, the pilot is expected to comply and then advise ATC. Deviating from an ATC clearance by responding to an RA collision avoidance recommendation is treated the same as maneuvering to avoid collision visually – it does not rise to the level of an emergency and is not considered a violation of an IFR clearance, but it still requires a report to controllers.

Other traffic detectors – TCAD, TIS, ADS-B – display other-aircraft locations and relative altitudes (and with ADS-B, potentially more), but they do not provide an RA in the event of a near collision. Non-TCAS traffic detectors do, however, give us an additional tool to detect and maneuver around other aircraft in flight.

The VFR Pilot

We don't know anything more about the VFR pilot than what the MU-2 pilot told us: an unknown-type aircraft not in contact with ATC was descending in IMC on a course that may have led to a collision had the MU-2 pilot not maneuvered out of the way. Interestingly, the pilot of the other aircraft apparently had the MU-2 in sight of its own traffic device, assuming it was in IMC as described, or he/she made a completely coincidental turn just as the two airplanes were coming together.

It's possible that what the MU-2 pilot interpreted as instrument meteorological conditions were seen by the VFR pilot as visual meteorological conditions. If that was the case, the VFR pilot would have been required to maintain VFR visibility and cloud clearance requirements – generally three miles visibility and at least 500 feet below, 1,000 feet above and 2,000 feet laterally from clouds. In Class G airspace, this reduces to one-mile visibility and clear of clouds.

Most pilots are taught VFR minimums exist to provide the visual pilot enough outside references to maintain spatial orientation and avoid losing control of the aircraft.

But in all but Class G airspace, the requirements are greater. Above 10,000 feet the separation requirements are greater still. The reality is that VFR minimums exist solely to prevent collision with an IFR airplane legitimately popping out of the clouds. That's why the VFR limits are reduced in Class G airspace – without ATC control, it's unlikely to see IFR operations under most circumstances (back to that shortly). At higher altitudes, IFR traffic is often flying faster, requiring a greater amount of time (distance) to see-and-avoid.

A few other possible scenarios for the VFR pilot in this near-collision – an airplane in distress, operating on a different ATC frequency combined with lack of coordination among controllers – but they seem unlikely.

Approaches at Nontowered Airports

The National Business Aviation Association (NBAA) has published, "Operating into a Non-Towered Airport?" The document is aimed primarily at the issue of closing contract control towers, turning Class D airspace into Class E and often Class G close to the surface, but the core issue remains collision avoidance. The guide states:

When approaching the airport, crews should also make a point to keep their eyes outside the cockpit in order to see and avoid other traffic and monitor the radio to help ascertain the positions of other aircraft in the vicinity. Pilots should also communicate their position and cooperate with other pilots in the area to establish the safest approach to the field, with the least potential for conflict with other traffic.

This is fairly basic guidance and is prefaced by this statement:

…pilots operating under an IFR flight plan to a…non-towered field will need to be prepared for the transition from the positive control environment of instrument flight when approaching their destination. These are skills that all business aircraft pilots should be familiar with but now will have to be applied at locations with newly closed control towers….

Well, yes, business pilots not only should but must follow the rules of visual flight in non-towered and uncontrolled airspace. See and avoid is the first and last defense, regardless of the aircraft type or performance.

FAA issued Advisory Circular 90-66B, "Non-towered Airport Flight Operations," also provides basic guidance:

The pilot in command's (PIC) primary responsibility is to see and avoid other aircraft and to help them see and avoid his or her aircraft. Keep lights and strobes on. The use of any traffic pattern procedure does not alter the responsibility of each pilot to see and avoid other aircraft. Pilots are encouraged to participate in "Operation Lights On," a voluntary pilot safety program described in the AIM, paragraph 4-3-23, that is designed to improve the "see – and – avoid" capabilities.

Pilots should clearly communicate on the CTAF and coordinate maneuvering for and execution of the landing with other traffic so as not to disrupt the flow of other aircraft. Therefore, pilots operating in the traffic pattern should be alert at all times to aircraft executing straight-in landings…Instrument approaches should be particularly alert for other aircraft in the pattern so as to avoid interrupting the flow of traffic, and should bear in mind they do not have priority over other VFR traffic. Pilots are reminded that circling approaches require left-hand turns unless the approach procedure explicitly states otherwise. This has been upheld by prior FAA legal interpretations of § 91.126(b).

The Mitsubishi's Approach

KHZL has three published approaches. The lowest approach minimums are on the RNAV (GPS) 28 approach (figure 1), which when flown as an LPV has a Decision Altitude (DA) of 1978 MSL…375 feet above the touchdown zone elevation (TDZE). Hazelton Regional is in Class G airspace, with Class E existing above 700 feet AGL (figure 2). This highlights an aspect of flying approaches at nontowered airports that many instrument pilots may not consider – in the last 325 feet of the approach above minimums, or from about 2,300 feet MSL on down, it's perfectly legal for a VFR pilot to be just barely skimming the bases of the clouds and ATC may not tell you about it. Worse yet, many airplanes in this area are not required to have ADS-B or even a transponder.

Figure 1

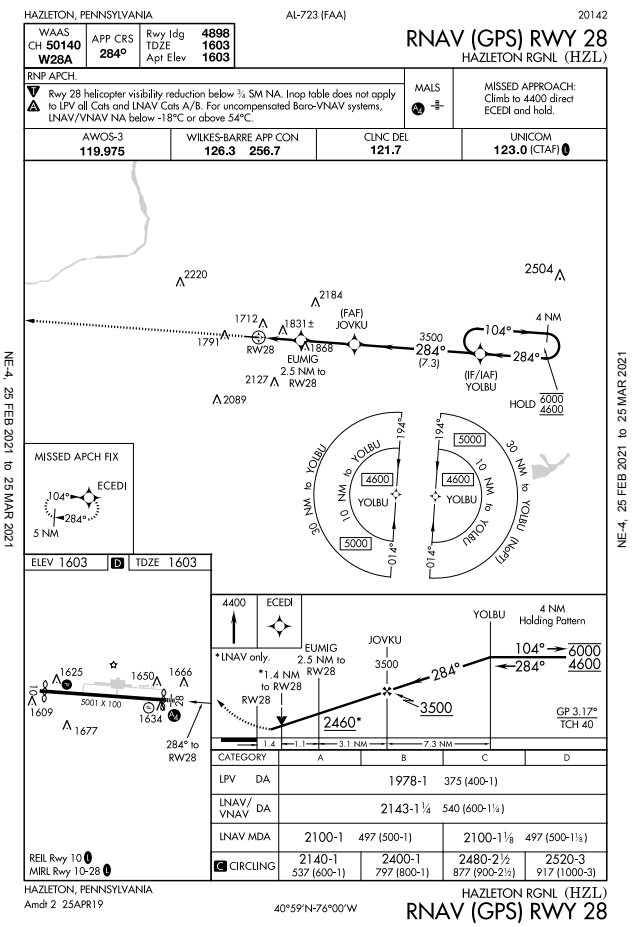

Figure 2

I experienced this very thing on the first "actual" instrument approach I ever flew in the first IMC I'd ever experienced. As a newly minted IFR pilot, I flew a Cessna 182 on a 40-mile repositioning flight that terminated with an NDB approach into Boonville, Missouri. Breaking out on final approach, I saw another Skylane just ahead and below, crossing the approach course at a slight angle and somewhat faster cruise speed. The block letters spelling "Highway Patrol" atop the other airplane's wing made it stand out in the murk. Early in my career I learned that the mix of IFR and VFR traffic on a marginal day requires vigilance.

From the MU-2 pilot's narrative, he was higher than that and the conflicting airplane was higher still. But it reminds us of some collision avoidance techniques to use in and out of the clouds, whether or not the other pilot is legal at the time:

- **Be obvious.** Run strobes and/or navigation lights if they do not cause you disorientation in the clouds. It's sometimes a challenge, but swap back and forth to the advisory frequency and announce yourself. Use distance, direction and altitude so non-IFR pilots will know where to look. For example, crossing JOVKU inbound on KHZL's RNAV (GPS) 28, radio "five miles east, 3,500, descending straight in Runway 28." If the other pilot is on CTAF this may help.
- **Be predictable.** Fly the procedure as published, including intermediate step-down altitudes. Someone who is familiar with instrument procedures will be expecting you at specific locations and altitudes and may be plotting to avoid you based on those expectations.
- **Be vigilant.** Legally near you or not, ATC may not be able to point out traffic as you fly an approach. Especially when breaking out on an approach at a nontowered airport, watch for VFR traffic in and near the pattern.
- **Be ready to act.** Instrument pilots get tremendous help from Air Traffic Control. But ultimately, the pilot-in-command is responsible for traffic avoidance. We all know that we must see-and-avoid when in visual condition even on an IFR flight plan. But even when in the clouds, if a traffic detection device shows a collision may be imminent, maneuver to avoid it and tell ATC later.

None of these suggestions will guarantee collision avoidance all of the time. But each of them will do the job at least some of the time. T&T

Reporting a "Near Hit"

If you have a close call, reporting your experience might lead to improvements in the system. When in communication with a controller, report the incident immediately. A report will be entered into the FAA's Near Midair Collision (NMAC) reporting program. Be specific as ATC will not interpret a casual remark as an official report. The pilot should state, "I wish to report a near midair collision." You may also report by telephone to the nearest Flight Service Station or write the nearest Flight Standards District Office. You may also use the Aviation Safety Reporting System (ASRS) – operated by NASA – to report a near miss.

Source: AOPA

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

KING AIR B200 – ELLIOTT AVIATION

CABIN UPGRADES

TIPS FOR MAXIMUM COMFORT AND ROI

by **Dale Smith**

Let's say that you've already upgraded the avionics in your airplane as far as your needs require and your budget allows. The obvious next steps in the typical upgrade path are the interior and paint. And while many of us would think that a new paint job would add the highest short-term return, that may not be the case, especially if your aircraft is of the larger-cabin class. There's a pretty clear differentiator in what the guy or lady sitting in the cockpit's left seat values versus the person sitting in the cabin's right rear seat.

"You can paint an airplane, and it looks great on the ramp, but you're only going to see it for a few minutes," stated Phil Stearns, director of sales and marketing at Stevens Aerospace and Defense Systems. "You're going to spend hours and hours in that airplane's cabin. That's where you're typically going to spend time and money regarding the materials, finishes and amenities to get maximum return on that investment."

Of course, the only one that's a sure-fire winner is to put on new engines. That's guaranteed max ROI. Anything else, and, at best, you're looking at recouping varying percentages of the original cost.

Before and After. A King Air receives AvFab's pleated window shades, an arm ledge table system, ClearView headrests and more.

What's New? Leather materials that look like fabrics but are more resistant to wear and stains. Hydrodipping (right) – a cost-effective way to change the look of any hardgoods.

Start with a Clear Goal

When it comes to cabin upgrades, you can put them into two basic categories: One is an inexpensive, clean, and brush-up of the soft and hard surfaces to aid in an upcoming sale. The second is someone who is planning on keeping the aircraft for a long while. While the two may be different, their goals are not mutually exclusive.

"We need to start with what they want to accomplish. Are they a private owner, flight department, or a Part 135 (charter) operator? Each has its own needs," Angie Coleman, Duncan Aviation senior completions and modifications sales representative, said. "They all want style and comfort, but a Part 135 operator will want more durable, easy-to-clean materials because of their frequent flights."

That being said, no matter who's back there, nobody wants to spend hours sitting in a cabin that looks old – well, not unless they're in a Staggerwing.

"Our experience has been that mods that update the appearance to more closely replicate the look of a new production aircraft are best," stated Jeff Lowe, president, Aircraft Fabricators (AvFAB). "Many times, the guy writing the check is sitting in the main cabin, so he'll understand the benefits of modernizing the cabin."

"Most customers today are looking to upgrade seats from the older rounded contours to a more contemporary squared-off look. It's very clean," Coleman said. "We're also finding owners wanting to get away from the large, poofy headrests to get a cleaner look. New Citation and King Air cabins are good examples. That's the look they want."

Another point to consider is what you don't currently like about your cabin. Are the seats uncomfortable? Does it lack storage? What do you need that it doesn't provide?

"There's a reason that you want to upgrade the interior in the first place. Is it dirty, smelly, or just worn out? Or, maybe you just don't like the look of it anymore. There's always a reason for an owner to spend money," said Stevens Aerospace and Defense Systems Regional Sales Manager John Walker. "Look at all the components. If you want to recover the seats, how do the sidewalls look? How about the headliners? How's the woodwork looking? There was some ugly stuff used in the 1980s in King Airs and Citations – somebody liked it back then, but not now," he added. "And, if you're looking to put it on charter, you need some kind of connectivity or texting capability onboard. In today's world, no one will charter the airplane if it doesn't have it."

According to Meghan Welch, director of paint and interior sales for

Elliott Aviation, another popular upgrade today is increasing cabin storage space.

"Functionality is a major part of cabin upgrades today. We need to make sure that the finished cabin meets all of the customer's needs no matter the use," she said. "Whether it's upgrading the galley or reconfiguring the space, we never want a customer saying, 'I wish I had thought of that.' We have on-staff engineering, which really helps ease those types of changes. We start with what their ultimate goals are and then design the solution that best fits their needs."

Popular Cabin Upgrades

Okay, so we've established that making your cabin look newer and more comfortable is a great way to maximize your ROI. But, what in particular are your options?

"The sky's the limit as far as what you can do with the design and materials. But today the trend is towards less is more," Welch said. "Contrast is still a very popular design direction – darker cabinetry with lighter upholstery and finishes. Look at popular automotive interior trends."

As for what's new with materials and finishes, Walker said that some new leather materials look like fabrics but are much more resistant to wear and stains. Those will be great if you travel with children, pets or if your airplane ever finds its way into Part 135 service. Regarding those 80s era "ugly wood finishes," Duncan Aviation is now offering hydro-dipping, which is a cost-effective way to totally change the look of any hardgoods in the cabin at a very affordable price.

"This is a larger application of hydrographics technology," Coleman said. "With the hydrodipping application, we can get the same deep, long-lasting finish. It's becoming more affordable and is a great option now for smaller cabin aircraft."

"The upgrades that we see as the most popular right now are those that solve a problem and update the cabin's appearance," Lowe stated. "For example, if you have a King Air with the factory [cabin window] polarizers, we can replace them with our new 360-style pleated shades. They not only give the cabin a modern look, but they also eliminate the ongoing issues owners have with replacing those polarizers every few years."

Cabin Connectivity and LED Lighting

While a full-on WIFI solution may be too expensive for most smaller cabin aircraft, there are connectivity options. Most of the major avionics manufacturers have some type of lower-cost texting or voice solution, whether it's satellite- or air-to-ground-based.

"There is a solution for practically any type of aircraft to stay connected with the earth – voice, texting, even streaming – it's all more affordable today," Stearns said. "We work closely with our customers to find what will work best in their situation, what's reliable, what works, and what's affordable? Their best solution may be to not do anything."

While connectivity is probably on every passenger's must-have list, it's not the only electronic upgrade you

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owner/operators and chief pilots of these air

100%

TOTAL MARKET COVERAGE

JETS - 17,806

CHIEF PILOTS & OWNERS

COUNT	AIRCRAFT
36	AIRBUS ACJ319
30	ASTRA 1125
32	ASTRA 1125SP
57	ASTRA 1125SPX
29	BEECHJET 400
266	BEECHJET 400A
195	BOEING BBJ
503	CHALLENGER 300
40	CHALLENGER 600
26	CHALLENGER 601-1A
121	CHALLENGER 601-3A
54	CHALLENGER 601-3R
325	CHALLENGER 604
7	CHALLENGER 800
148	CITATION 500
340	CITATION 525
318	CITATION BRAVO
187	CITATION CJ1
96	CITATION CJ1+
240	CITATION CJ2
225	CITATION CJ2+
476	CITATION CJ3
174	CITATION CJ3+
368	CITATION CJ4
189	CITATION ENCORE
74	CITATION ENCORE+
392	CITATION EXCEL
14	CITATION I
280	CITATION I/SP
445	CITATION II
54	CITATION II/SP
155	CITATION III
124	CITATION LATITUDE
247	CITATION M2
467	CITATION MUSTANG
130	CITATION S/II
323	CITATION SOVEREIGN
105	CITATION SOVEREIGN+
310	CITATION ULTRA
285	CITATION V
31	CITATION VI
122	CITATION VII
329	CITATION X
38	CITATION X+
253	CITATION XLS
301	CITATION XLS+
1	DIAMOND I
32	DIAMOND IA
16	DORNIER ENVOY 3
304	ECLIPSE EA500
75	EMBRAER LEGACY 500
100	EMBRAER LEGACY 600
53	EMBRAER LEGACY 650
247	EMBRAER PHENOM 100
328	EMBRAER PHENOM 300
80	FALCON 10
22	FALCON 100
16	FALCON 200
242	FALCON 2000
27	FALCON 2000EX
34	FALCON 20C
15	FALCON 20C-5
17	FALCON 20D
1	FALCON 20D-5
10	FALCON 20E
49	FALCON 20F
75	FALCON 20F-5
197	FALCON 50
8	FALCON 50-40
118	FALCON 50EX
178	FALCON 900
24	FALCON 900C
116	FALCON 900EX
156	GLOBAL 5000
123	GLOBAL EXPRESS
25	GULFSTREAM G-100
239	GULFSTREAM G-200
14	GULFSTREAM G-300
24	GULFSTREAM G-400
313	GULFSTREAM G-450
11	GULFSTREAM G-500
602	GULFSTREAM G-550
27	GULFSTREAM G-II
12	GULFSTREAM G-IIB
111	GULFSTREAM G-III
175	GULFSTREAM G-IV
338	GULFSTREAM G-IVSP
204	GULFSTREAM G-V
38	HAWKER 1000A
2	HAWKER 125-1A
2	HAWKER 125-1AS
12	HAWKER 125-400AS
2	HAWKER 125-600A
1	HAWKER 125-600AS
61	HAWKER 125-700A
72	HAWKER 4000
223	HAWKER 400XP
44	HAWKER 750
153	HAWKER 800A
14	HAWKER 800B
398	HAWKER 800XP
42	HAWKER 800XPI
88	HAWKER 850XP
187	HAWKER 900XP
2	JET COMMANDER 1121
2	JET COMMANDER 1121B
2	JETSTAR 731
4	LEARJET 23
12	LEARJET 24
2	LEARJET 24A
7	LEARJET 24B
20	LEARJET 24D
8	LEARJET 24E
6	LEARJET 24F
4	LEARJET 25
19	LEARJET 25B
4	LEARJET 25C
45	LEARJET 25D
4	LEARJET 28
32	LEARJET 31
182	LEARJET 31A
26	LEARJET 35
398	LEARJET 35A
21	LEARJET 36
33	LEARJET 36A
32	LEARJET 40
243	LEARJET 45
225	LEARJET 45XR
92	LEARJET 55
6	LEARJET 55B
8	LEARJET 55C
307	LEARJET 60
623	PILATUS PC-12/45
149	PREMIER I
1	SABRELINER 40
7	SABRELINER 40A
2	SABRELINER 40EL
2	SABRELINER 40R
4	SABRELINER 60
5	SABRELINER 60ELXM
68	SABRELINER 65
7	SABRELINER 80
1	SABRELINER 80SC
67	WESTWIND 1
1	WESTWIND 1123
14	WESTWIND 1124
50	WESTWIND 2

TURBOPROPS - 12,801

CHIEF PILOTS & OWNERS

COUNT	AIRCRAFT
403	CARAVAN 208
1,523	CARAVAN 208B
155	CHEYENNE I
16	CHEYENNE IA
206	CHEYENNE II
56	CHEYENNE III
38	CHEYENNE IIIA
57	CHEYENNE IIXL
35	CHEYENNE IV
235	CONQUEST I
291	CONQUEST II
38	JETSTREAM 31
63	JETSTREAM 32
52	JETSTREAM 41
37	KING AIR 100
450	KING AIR 200
17	KING AIR 200C

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229	KING AIR 250
182	KING AIR 300
14	KING AIR 300LW
617	KING AIR 350
62	KING AIR 350C
8	KING AIR 350ER
387	KING AIR 350I
4	KING AIR 350IER
8	KING AIR 90
6	KING AIR A/B90
76	KING AIR A100
184	KING AIR A200
34	KING AIR A90
197	KING AIR A90-1
105	KING AIR B100
1,038	KING AIR B200
107	KING AIR B200C
99	KING AIR B200GT
5	KING AIR B200SE
8	KING AIR B200T
47	KING AIR B90
302	KING AIR C90
38	KING AIR C90-1
186	KING AIR C90A
378	KING AIR C90B
76	KING AIR C90GT
88	KING AIR C90GTI
150	KING AIR C90GTX
13	KING AIR C90SE
258	KING AIR E90
173	KING AIR F90
28	KING AIR F90-1
5	MERLIN 300
13	MERLIN IIB
8	MERLIN III
22	MERLIN IIIA
44	MERLIN IIIB
14	MERLIN IIIC
3	MERLIN IV
11	MERLIN IV-A
101	MITSUBISHI MARQUISE
18	MITSUBISHI MU-2F
1	MITSUBISHI MU-2G
15	MITSUBISHI MU-2J
37	MITSUBISHI MU-2K
12	MITSUBISHI MU-2L
25	MITSUBISHI MU-2M
24	MITSUBISHI MU-2N
29	MITSUBISHI MU-2P
47	MITSUBISHI SOLITAIRE
796	PILATUS PC-12 NG
197	PILATUS PC-12/47
296	PIPER JETPROP
74	PIPER M500
92	PIPER M600
602	PIPER MERIDIAN
198	QUEST KODIAK 100
2	ROCKWELL 680T TURBO
5	ROCKWELL 680V TURBO II
4	ROCKWELL 680W TURBO II
4	ROCKWELL 681 HAWK
85	SOCATA TBM-700A
90	SOCATA TBM-700B
381	SOCATA TBM-850
121	SOCATA TBM-900
38	SOCATA TBM910
136	SOCATA TBM930
6	STARSHIP 2000A
50	TURBO COMMANDER 1000
22	TURBO COMMANDER 690
131	TURBO COMMANDER 690A
135	TURBO COMMANDER 690B
73	TURBO COMMANDER 840
20	TURBO COMMANDER 900
19	TURBO COMMANDER 980

TWIN PISTON - 6,872 OWNERS

COUNT	AIRCRAFT
35	BARON 56 TC
1,566	BARON 58
446	BARON 58P
118	BARON 58TC
3	BARON A56TC
335	BARON G58
158	BEECH DUKE B60
150	CESSNA 340
480	CESSNA 340A
49	CESSNA 402B BUSINESS LINER
110	CESSNA 402C
20	CESSNA 404 TITAN
312	CESSNA 414
430	CESSNA 414A CHANCELLOR
36	CESSNA 421
30	CESSNA 421A
335	CESSNA 421B
713	CESSNA 421C
38	CESSNA T303
100	DIAMOND D42
65	PIPER 600 AEROSTAR
3	PIPER 600A AEROSTAR
44	PIPER 601 AEROSTAR
4	PIPER 601B AEROSTAR
182	PIPER 601P AEROSTAR
21	PIPER 602P AEROSTAR
509	PIPER CHIEFTAIN
20	PIPER MOJAVE
280	PIPER NAVAJO
196	PIPER SENECA
13	ROCKWELL 520 COMMANDER
3	ROCKWELL 560 COMMANDER
11	ROCKWELL 560A COMMANDER
7	ROCKWELL 560E COMMANDER
6	ROCKWELL 560F COMMANDER
12	ROCKWELL 680 SUPER
3	ROCKWELL 680E
14	ROCKWELL 680F COMMANDER
11	ROCKWELL 680FL GRAND COMMANDER
4	ROCKWELL 680FLP GRAND LINER

HIGH PERFORMANCE MOVE-UP SINGLES - 5,726 OWNERS

COUNT	AIRCRAFT
200	BEECH BONANZA
435	CESSNA 182
52	CESSNA 206
373	CESSNA P210N
21	CESSNA P210R
54	CESSNA T182
790	CIRRUS SR20
2,875	CIRRUS SR22
26	MOONEY ACCLAIM ULTRA
11	MOONEY OVATION ULTRA
271	PIPER MALIBU
93	PIPER MATRIX
525	PIPER MIRAGE

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Completed Gulfstream G200 interior – Stevens Aerospace.

can do that will add value to your aircraft's cabin.

"Along with the new seat-located USB ports, another popular upgrade is LED cabin lighting. Switching upwash, downwash, even the reading lights to LED is a huge upgrade," said Jeff Simmons, Duncan Aviation's senior avionics sales representative. "You can get systems that change color that is very nice. Even if the owner wasn't thinking of lighting initially, once the cabin is disassembled, that's the time to do it. It's a cost-effective upgrade that makes a big difference."

That's a great point: once the cabin is disassembled for any work, it's a good idea to take a look at other work you want to do now or in the future.

"Anything you can do now in the way of preparing for future upgrades or additions will save time and money," Stearns said. "Whether it's seat-located USB chargers, new navigation/communications antennas, or whatever. You can save thousands by doing the work now. That's part of a good, detailed pre-project plan. It's not only what you want to do today, but what's coming in the next couple of years."

SWAT Your Old Cabin Away

While we've covered a lot of options, one that we haven't mentioned is a new service from Duncan Aviation that is now available at all three of the company's MRO locations called SWAT: Survey Aircraft Interiors, Write Prompt Quotes, Artistically Clean, Touch-Up, Dye, Correct, and Transform Appearance and Functionality.

According to the company, the SWAT team will go through the aircraft and take care of all the "small items" that are not part of an aircraft's scheduled service. SWAT services include touching up paint, spot-dying leather seats, resewing curtain guides – a myriad of things that will give your cabin an overall fresher look.

So, What's the Bottom Line?

Whether it's a simple cleaning, new upholstery, carpeting and sidewalls, hydrodipped hard goods, connectivity, and whatever else you can think of, there's seemingly no limit to what you can do to make your cabin look like new.

The problem is, which upgrades will pay off? Well, again, if you're keeping the airplane, then it's totally up to you. Anything that adds comfort and convenience to any flight is a worthwhile upgrade. But, if you're on the fence about selling sometime soon, then you may well benefit from discussing your plan with a licensed aircraft appraiser/dealer.

"What appraisers typically say to us is that as long as the cabin refurb is new looking and well maintained, they will get a good percentage of their investment back," Welch said. "They get to enjoy the new cabin now and get a good payback later on."

One thing you have to be careful of, though, is unless you plan on keeping the airplane for a long time, don't get too carried away with the colors and finishes you select. You may love doing all the soft finishes in your alma matter's colors, but the next owner may not share your enthusiasm.

"Don't give a prospective buyer a reason to look away from your airplane," Stearns said. "A great broker can help you look beyond the cosmetics of a good airplane, even if it's as simple as cleaning the seats and adding new carpet runners. If you're trying to move a million-and-a-half-dollar airplane, spending a little on a few things is nothing compared to the value of the airplane."

Too true. It's like looking at an exotic car. If one is just plain unkempt looking and the other is looking "factory new," even if it costs X-thousands more, you're more likely to want to take the clean one home. It's just human nature.

As one interior shop owner said, "It's amazing and a bit sad that an aircraft owner will live with worn-out looking carpeting, scratched windows, and scuffed sidewalls for years. But, when they decide to sell, they're all up for making it look new. It's a shame they don't just want to make it nicer and more comfortable for their own enjoyment."

So, what's the bottom line when it comes to which cabin upgrades will bring the best return? Like we discovered in the avionics upgrade story in T &T's December 2020 issue, it all depends on, well, way too many things to cover in this story. But as Stearns stressed, don't just look at the bottom-line budget. Take time to explore all your options.

"Don't just ask for an interior quote, but take some time to meet and speak with your interior designer about what's important to you. How you use the airplane? Don't hold back from saying, 'what if we could do this, or replace that?'" he said. "Don't just settle for a beautiful interior, but get a beautiful interior that's yours." T&T

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

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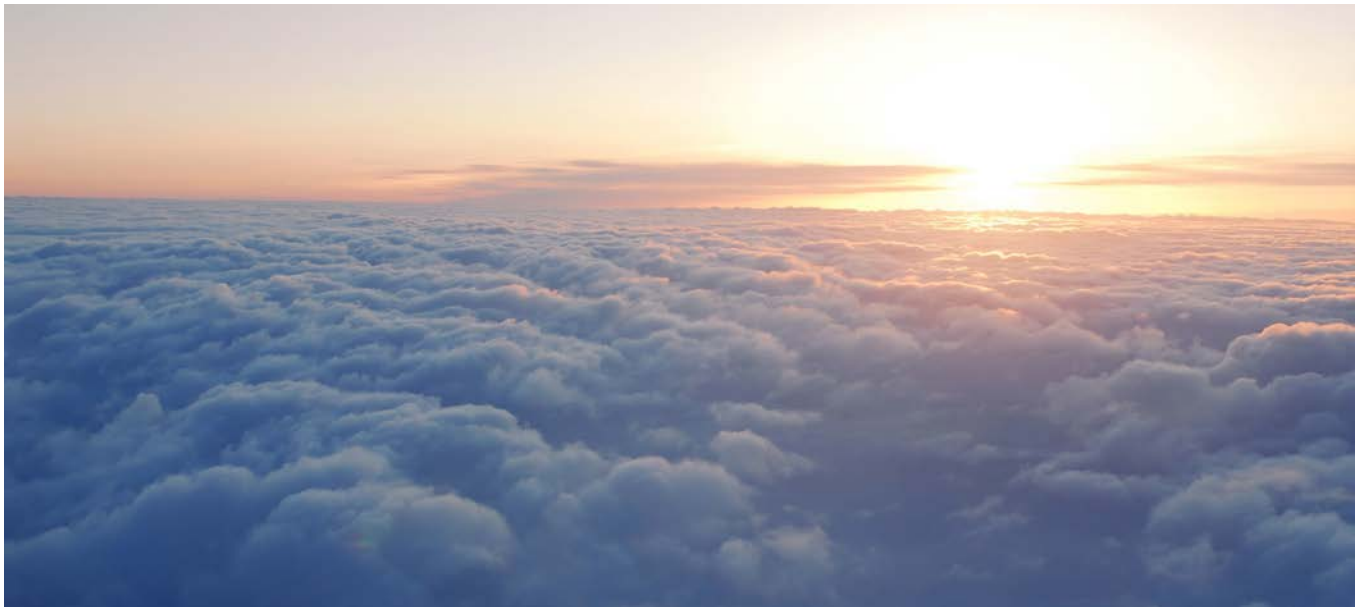
by **Kevin Ware**



When I was an 18-year-old high school senior, I read in the classified section of the Seattle Times that a flight school on Boeing Field was offering a "guaranteed to solo" package for $99. At the time, I was making $1.25 per hour pumping gas, checking oil and cleaning windshields in a gas station – $99 was a lot of money. But I really wanted to do this, so I went and found the flight school in an old rundown Quonset hut on the south end of the airport. It was run by a couple of old gruff, laid-off airline pilots. I paid the money and the larger and louder of the two recommended we get started right away. So out we went to preflight the training aircraft, an ancient 85 horsepower fore and aft seating Tri-Champ. It had a Narco coffee grinder VHF radio, no headsets and microphones that looked like they belonged to a WWII bomber crew, each hanging on a hook on the left side.

After a minimal preflight, we cranked up the little engine and taxied out to Runway 12, did a brief run-up, and took off with a straight-out departure down toward the Kent Valley. As the cars, houses and people beneath us gradually became smaller and smaller, I was immediately fascinated by the magic of it all. I stared wide-eyed out the right side of the airplane until all of a sudden, a microphone flew past my head and nearly banged me on the ear. This was accompanied by a string of loud, mostly four-letter words to the effect that we were up here to learn to fly, not stare at the ground, and if I did not start paying attention right away, he was going to whack me on the head with the microphone.

Not knowing anything about flight training (and just assuming that threats of physical violence must be a normal part of learning to fly), I then paid attention to everything the man said. One week and 4.4 hours later, I soloed. I completed three somewhat bouncy landings, then pulled the Tri-Champ up to the flight school ramp all by myself and shut the airplane down. I just sat there for a while, savoring the magic of what had just occurred. My instructor stood on the building's porch looking somewhat disgruntled. It turns out, for $99, they try to solo all their students in less than 4.5 hours, and I had just barely met their criteria.

I, of course, wanted to fly some more but was told I would need to bring in more money. A month or so later, I was back with about $50 and asked which was the cheapest airplane for me to fly. Their reply was not the Tri-Champ as that airplane was busy soloing other $99 specials, but they could check me out in the Cessna 120. Off we went to explore the mysteries of tailwheel operations, and sure enough, within another hour, they had me soloing in that airplane. From a teenager's perspective, I found the tricky ground steering and the fact the airplane desperately wanted to ground loop to be fascinating. I just loved it. It was also magic.

I graduated from high school shortly thereafter and moved to Florida where I had a seasonal job working in a hotel as a bellboy. With my eyes set on becoming a pilot, I came across a 65 HP Piper Cub based on a grass airport south of Miami that the owner would rent for $4 per hour,

not including fuel. I spent my next 50 hours in that airplane with the doors open flying over the Everglades and up and down the Florida Keys. The air at 1,000 feet seemed cooler than on the ground, and with the doors open, I could easily smell the exhaust of the 65 HP engine. I do not recall ever seeing another airplane during all of those wanderings, but to this day, I remember all the wildlife magically visible from an altitude less than 500 feet.

More time went by as I earned a commercial license and CFI ratings. During my first week as a flight instructor at a nearby FBO, I was asked to fly a charter in the operation's largest aircraft…a big Cessna 172. We went out over the Everglades looking for an abandoned boat that the charterers had their eye on. We eventually found it, and I finally got some practical value out of all the turns about a point I had practiced as they took a couple of photo rolls. Returning to the Tamiami Airport, I had the magical feeling I was the captain of a huge airliner returning from some exotic far-off destination.

A couple of years later, I was in the Seattle area again, flight instructing as I worked my way through college. In the winter, the days are short at the 48th parallel, and as a result, a lot of the instruction was done at night. In the Puget Sound area, there is typically a series of cold or occluded fronts that pass over one after another for weeks on end. In between, if you are lucky, there will be a 12 or 24-hour period where the air is just crystal clear. During one of those nights just before Christmas, while in a holding pattern for the ILS 12 approach into BFI, the entire City of Seattle was lit up in such a sparkling fashion that it looked like a Christmas tree, with the light at the top of the Space Needle looking like the tree's highest decoration – magic.

More years and many flights later, my wife and I decided to do an airborne tour in Africa. We flew commercial into Johannesburg and with the help of a tour operator rented a somewhat bedraggled C182. The plan was to fly about two hours north until reaching the Zambezi River, then make a left turn and fly down the river until we spotted the dirt strip belonging to the lodge where we planned to spend a couple of days. Flying at 2,000 feet or so over the plains to the north of what the locals called "Joberg," we came across a huge herd of Wildebeest running along helter-skelter just like in the wildlife TV programs. I just could not resist seeing what would happen when a really big bird approached them from above. So, banking toward the herd in a steep descent, we leveled off almost at eye level as they thundered along. The effect was fascinating as the herd would separate just enough to stay away from being directly under the airplane, all seemingly in a coordinated fashion. It was indeed the stuff nature films are made of and indeed magical.

A couple of years later, I was returning from a cross-Atlantic trip to England in a Cessna Citation. The route took us out over the Hebrides and the southern part of Iceland and Greenland. It was one of those rare perfectly clear days, and sitting in the right seat of the jet at FL410, I could see forever. But what caught my eye were the little ice cubes scattered about the blue ocean. It took a while for me to realize that those pieces of ice were magically larger than most city blocks. It is a rare person who gets to see the world from that high perspective.

Finally, one of my favorite airborne experiences is taking off on a grey cloudy day, and a few minutes later breaking out on top to see a perfectly clear blue sky on top of a sea of white clouds. The sunglasses go on, the airplane's interior starts to warm up, and life seems more magical than it did just five minutes before.

These kind of experiences are what keep us flying. And in these times of COVID hysteria, it helps to remember just how magical they are. T&T

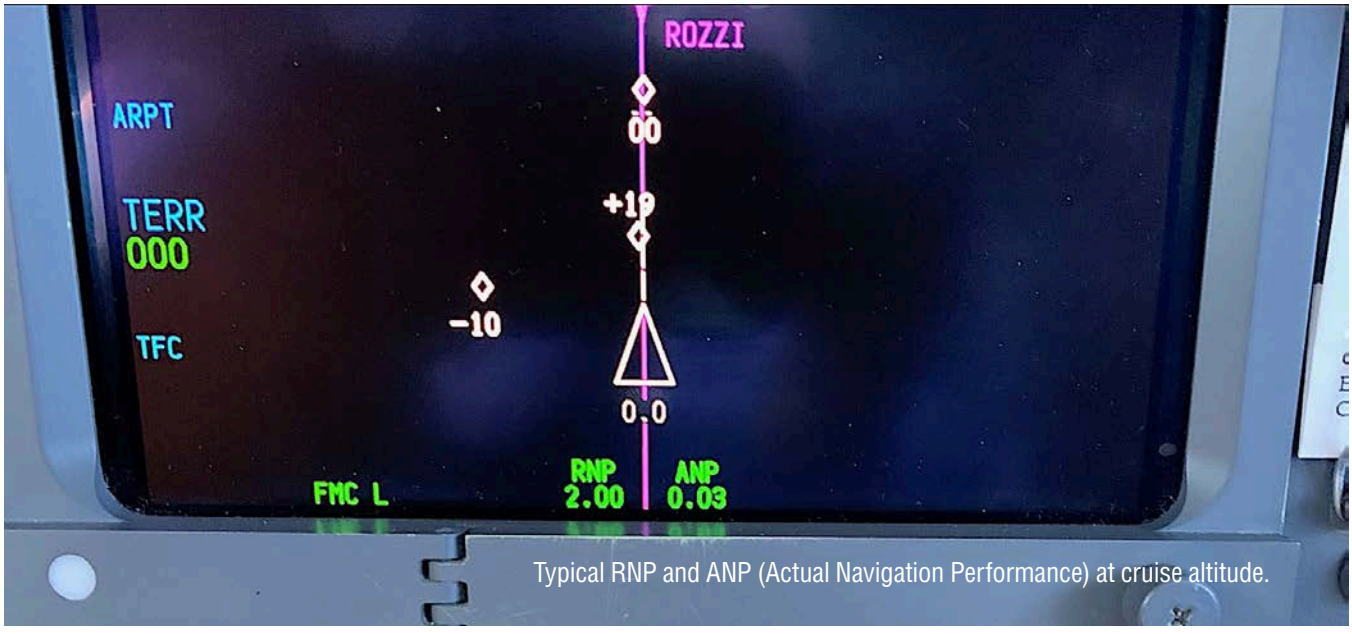
Kevin Ware *is an ATP who also holds CFI, MEII and helicopter ratings, has more than 10,000 hours and is typed in several different business jets. He has been flying for a living on and off since he was 20, and currently works as a contract pilot for various corporations in the Seattle area. When not working as a pilot he is employed part time as an emergency and urgent care physician. He can be reached at* **kevin.ware2@aol.com**.

by **Kevin R. Dingman**

Sliced Bread

Performance Based Navigation

Performance based navigation (PBN) provides for designing and implementing automated flight paths. It will facilitate improved access to airspace and runways, enhanced safety and reduced costs.



Typical RNP and ANP (Actual Navigation Performance) at cruise altitude.

Using a machine invented by Otto Rohwedder, a Missouri-based jeweler, the first automatically sliced commercial loaves of bread were produced by the Chillicothe Baking Company on July 6, 1928. The popular idiom "the greatest thing since sliced bread" means that something is "the best and most useful innovation or development invented for a long time." The first use of the expression is commonly attributed to Red Skelton, who used it to describe TV in 1952. NextGen is about halfway through a multi-year implementation plan, and the FAA plans to introduce technologies, procedures and policies through 2025 and beyond. This modernization of our air transportation system is "the most useful innovation or development invented for a long time." It's like sliced bread for pilots.

> You gotta be very careful if you don't know where you're going, because you might not get there.
>
> – Yogi Berra

The introduction of the VOR (Very High Frequency Omnidirectional Range) was air navigation's previous sliced bread. No longer did we need VMC or scud-running in order to use lighted airways or ground markers. A VOR ground station uses a phased array antenna to transmit a directional signal that rotates clockwise 30 times a second. They're assigned radio channels between 108.0 MHz and 117.95 MHz with the first 4 MHz shared with the ILS band. We started with relatively inexpensive "Low" VORs followed by the more useful but costly "High" VORs.

A worldwide land-based network of victor airways below 18,000 feet, and jet routes at and above 18,000 feet, was created. From the mid-1940s to the turn of the 21st century, VOR and Distance Measuring Equipment (DME) were the predominant navigational aids. "Area Navigation" began with LORAN-C in 1957 and OMEGA in 1971. The first aviation-specific Area Navigation systems (circa 1968, i.e., Narco CLC-60, King KNS-80 and

Collins ANS-31A) used existing VORs and "electronically moved" the ground-based transmitters to align them into the desired course. In 2000, there were about 3,000 VORs around the world, including 1,033 in the U.S. By 2013, they had been reduced to 967 and by 2020, to just under 900. Even though reliance on the above ground-based systems limits both the availability and accuracy of routes, the FAA and aviation alphabet groups recognize the necessity of maintaining multiple forms of navigation as a backup, and a Minimum Operational Network (MON) of VORs will remain operational indefinitely. The minimum number of VORs is expected to be 589 stations.

Necessity is the mother of invention.

– Plato

A historic increase in airline travel has been the major impetus for a new (and overdue) approach to air navigation. The advent of Flight Management Systems and computers that use multiple navigation sensors, like VOR and DME, allowed the electronic calculation of routes between points without flying over them. Computers also removed the need for pilots to calculate fixes and program RNAV units in order to "electronically move" ground stations. Position and route accuracy then increased geometrically with the advent of a satellite-based global positioning system.

As GPS was added to existing navigation units or as a stand-alone capability, Required Navigation Performance (RNP) was initiated. RNP describes how aircraft may fly an RNAV route or procedure using either ground-based or satellite-based navigation, as long as the required performance (RNP) specified in the procedure can be achieved. A required navigational performance is specified when position accuracy is essential for navigation accuracy, separation, and in many cases, obstacle clearance. RNP requires navigation systems to not only monitor performance compliance but to alert us if the aircraft flies outside of those parameters – it's at the heart of PBN. GA has not only ridden on the coattails of the resulting capability, utility and safety but very often has led the way.

You're right…we didn't have those things when we were young. We invented them.

– Ronald Reagan

Over the years we've all seen changes in our airspace system: TCA's (terminal control areas – now class B), TFR's (that aren't so temporary after all), RVSM (Reduced Vertical Separation Minimums), LAHSO (Land And Hold Short), PRM (Precision Runway Monitoring), and now with PBN, enroute RNAV, descend via and climb via RNAV arrivals and RNAV instrument approaches. These procedures have been developed for a variety of reasons, some of them to increase the efficiency of our airspace system and airports, and others to allow more aircraft to use the same airspace and airports simultaneously. There is no doubt the procedures are more stable, predictable and accurate than ever before.

And for general aviation, GPS/WAAS has opened thousands of "little" airports to us through the use of GPS approaches, especially when they have LPV minimums. GA continues to dominate the U.S. airspace and airport system, with three out of four takeoffs and landings conducted by GA. And out of some 19,000 GA airports, 4,074 have a GPS/WAAS augmented LPV approach with 2,876 of those to runways with no ILS – and over 1,050 of those have minimums to 200' HAT. The significance of this capability is astonishing to anyone who grew up flying ADF, VOR and circling approaches.

Except It's Your Butt

Single-pilot IMC in high-performance aircraft is a safe endeavor because of our training, equipment, and the reliability of avionics, powerplants and airframes. And because of the decreased workload these new technologies and reliability provide, including GPS, WAAS, LNAV, VNAV, ADS-B and real-time weather, our

inflight workload has been reduced. But as our airspace becomes more saturated, we have seen some of their workload shifted to the pilot to lessen the workload of controllers. A potential fly-in-the-ointment in this shift is the current tendency of controllers to use the word "except" when issuing a clearance to fly a three-dimensional (plus velocity) procedure.

We are normally prepared for the descent and instrument approach but sometimes get behind. ATC, weather, traffic, mechanical and passenger issues are common distractions. You will have reviewed the arrival and approach as published, including related NOTAMS and you are prepared to fly them – as published. It's less of an issue in a multi-pilot cockpit, but when you're by yourself and faced with late notice, unplanned, unpublished changes, we can easily get behind.

A vision, without a plan, is just a hallucination.

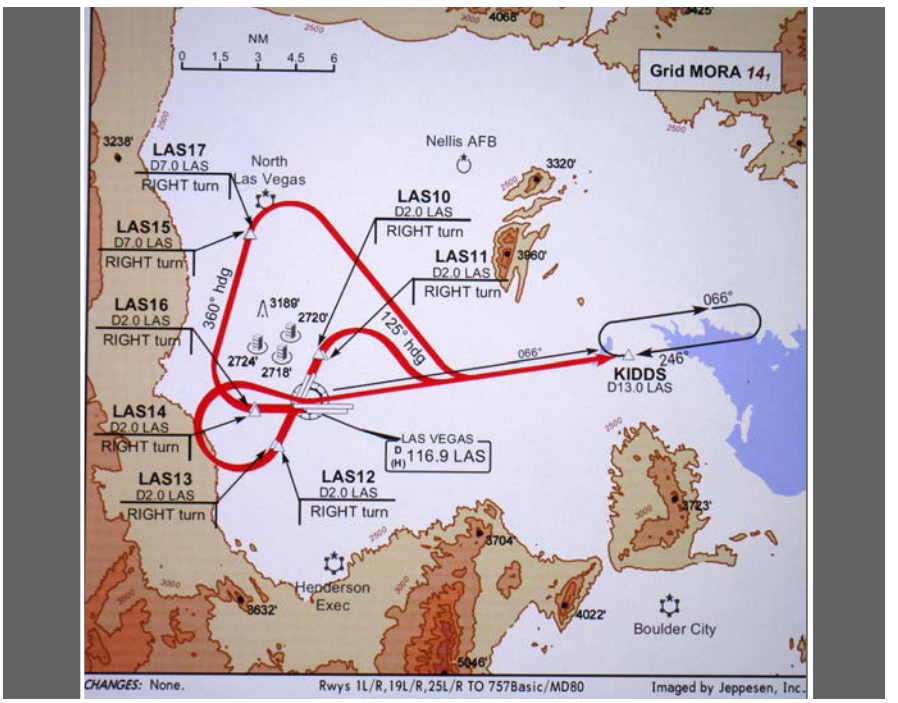
– Will Rogers

Controllers sometimes modify procedures by using the word "except" to change how we fly departures and descend via arrivals – even instrument approaches. For example, when they tell you to cross a fix on the approach "at" 5,000 when it's published as "at or above" 5,000 feet, that is an unpublished modification. The same is true when they tell you to fly 250 kts to fix A, 210 kts to fix B and then 180 to the marker. How often can ATC modify published procedures, routes, altitudes or speeds before they cease to be "published" procedures? How do we protect ourselves from violating short notice changes? Shall we add a note to our flight plans in the remarks section: PAPO (Procedures As Published Only). Or do we simply respond with "unable" when we're asked to comply with too many modified, inconsistent or unpredictable arrival or approach procedures? Due to COVID, our airspace system has been in "casual" mode for over a year, and the number of modifications has decreased. But as travel resumes, we can expect congestion and some confusion.

Pandemic Headwinds

The General Aviation Manufacturers Association's state of the industry media event on February 24 marked the first time the annual announcement of shipment and billing statistics was conducted virtually. During the event, GAMA released figures showing aircraft deliveries for the year valued at $22.8 billion, down from $27.8 billion in 2019. The 2,399 airplanes shipped in 2020 marked a 9.7-percent decline from 2019, with $20 billion in total billings, down 14.8 percent. Piston airplane deliveries (1,312) remained nearly stable from 2019 (1,324). However, turboprops took a 15.6-percent hit with 443 shipments, down from 525, and the 644 business jet deliveries skidded 20.4 percent from 809 in 2019.

"As expected, in 2020, the COVID-19 pandemic negatively impacted general aviation and stifled the industry's growth. While we continue to face headwinds globally, all signs point to strong demand for our products and services that are unfortunately being constrained by pandemic induced supply chain limitations and a vast array of disjointed barriers to air travel across national borders," GAMA President Pete Bunce said. This was seen as a bright spot in the business jet segment, however, since the decline was less than what had been



LNAV using GPS can provide an accurate engine failure ground track.

predicted. As we fly out the backside of the pandemic, we will see airspace and airport congestion increase as it supports the coming resumption in travel from massive pent-up demand.

Listen Up and Ask

As all aviation begins a post-COVID recovery and we become more comfortable with PBN and the associated policies, procedures, regulations and avionics, we will be less inclined to need memorization and math to fly our machines. Perhaps the E6-B and plotter have finally gone the way of unsliced bread, and this will decrease our workload. But while PBN may be like sliced bread for pilots, we should be prepared for the coming congestion and modifications to procedures.

Until ATC gets a handle on how often they can modify published procedures, we must be ready for changes in airspeed, altitude and direction – often using different phraseology; unless we respond with "unable." If you don't hear the word "resume" sometime after the word "except" in the modification of a speed, an altitude or a fix, then you are released from only "parts" of the procedure. But which parts? Listen up and query the controller if the clearance can be interpreted in more than one way. If we get confused or behind during the arrival and approach, the rolling snowball of dung can get smelly and unmanageable very quickly. And remember, it's your behind if you get behind. T&T

Kevin Dingman *has been flying for more than 40 years. He's an ATP typed in the B737 and DC9 with 28,000 hours in his logbook. A retired Air Force major, he flew the F-16 and later performed as an USAF Civil Air Patrol Liaison Officer. He flies volunteer missions for the Christian organiz tion Wings of Mercy, is employed by a major airline, and owns and operates a Beechcraft Duke.Contact Kevin at* **dinger10d@gmail.com**.

Buyer's Rejoice

First Month as Aircraft Owners

by **Jared Jacobs, Owner-Pilot**

Aircraft being the high-value, highly complex mechanical assets that they are, I am certain that buyer's remorse is a real condition owners can potentially find themselves in. While Editor Rebecca Jacobs and I could very well be in the honeymoon phase of ownership, we currently find ourselves in the exact opposite state – with a case of what I am calling "buyer's rejoice" (insert eye roll here).

As I write this, we are exactly one month into (co)ownership of our beautiful 1970 F33A Bonanza. Over the last month, 121RW has been discussed daily, visited frequently, and flown about 10 hours (despite the arctic vortex that shut down the Midwest for a week and a half).

If you are reading Twin & Turbine, chances are you have purchased an airplane (or multiple) and hopefully have fond memories of the experience. I imagine we also have some readers new to the world of general aviation or with life-long dreams of buying an airplane of their own (especially in a post-COVID era). In any case, Rebecca and I think there is value in continuing to share our story and perspective as first-time purchasers, whether to resurface memories for some or .inspire others. You can expect an update from us every two or three issues. Also, for tips for first-time searchers, see this month's Editor's Briefing – page 2.

Why the Bonanza

Naturally, when our search began at the end of last summer, the biggest question that needed answering was, "Which aircraft is right for us?"

To start, we gathered advice from everyone we could think of in our aviation circle – owner-pilots, salespeople, instructors, A&Ps, etc. We are super fortunate to be connected to many knowledgeable and experienced pilots both personally and professionally. We then established our mission and prospective aircraft in the September 2020 Editor's Briefing ("The Search is On"). In that article we explain that we really needed a cross-country machine with a capable IFR platform and listed a few of the obvious models that would meet that criteria – Mooney M20J, Cessna 210 and Beechcraft Debonair/Bonanza. Thanks to dozens of reader responses following that article, a few other aircraft were considered for the shortlist, but in the end, it was all going to come down to the almighty dollar. As first-time owners, we definitely did not want to overextend ourselves. However, when the prospect of a partnership became a real possibility in December, the budget and wish list started to more closely align. Co-ownership was a true gamechanger.

Let me pause here and confess that of the aircraft I listed above, there was one that already stood out as "the" airplane for us…the Bonanza. In our hearts, we are Beechcraft people. We wear the scarlet "B" with pride. Rebecca was raised in the back seat of an F33 and later an A36. And my first real pilot job was flying and demonstrating Bonanzas and Barons for Beechcraft. Looking back on our initial search, we were always comparing the other aircraft to the Bonanza. And now that we own one, I can't tell you the number of people who have told me, "I always knew you would end up with a Bonanza." It was less simple for us

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to arrive at this apparently obvious conclusion, but with the clarity of hindsight, I know that we made the right decision for us.

Why This Bonanza?

Our acquisition story of 1RW ("Introducing 121RW," T &T March 2021) is absolutely an example of the stars aligning. But coincidence is far from the only reason that we ended up with this aircraft. As soon as I saw the listing, I knew deep down that the aircraft was right for us.

First, we knew that we wanted a straight-tail Bonanza due to the number of question marks currently surrounding the future availability of the V-tail's ruddervator skin material. I also knew that for our long cross-country flights, we wanted the airplane to have at least an IO-520 to cover the distances faster. If you do a little research, you will learn that the straight tail model 33 earned the title of Bonanza in 1968 when the E33 was first offered with the upgraded "A" designation for the IO-520 engine. Two years later, the F33A would begin its 24-year run as the only straight tail, short body, big engine Bonanza. Today, the market for F33A's is very hot, so finding an aircraft in the budget that met our criteria was going to be tricky. But finding one of the earliest examples of an F33A (the sixth ever built, for instance) made 1RW a perfect fit.

While earlier model F33A's were more likely in our price range, there were a couple features of these aircraft that I wasn't sure about initially. The 1970 version of the F33A most notably has the small baggage door and the large hat shelf in the baggage area. By 1971, Beechcraft would remove the shelf to expand the cargo capacity and install the large baggage door found on the F33A for the rest of its production.

When you first look at the baggage area, it does seem like there is quite a bit of wasted space. But in reality, we can fit four roller bags standing straight up before needing to place any additional items on top, which is more than adequate for our needs. Another early model feature I was hesitant about was the 14-volt electrical system that was later swapped out in favor of a 28-volt system. After a little bit of research, though, it was clear that this wasn't necessarily a bad feature, just different – especially in the age of modern avionics and LED lighting that lessen the electrical load.

The main hidden benefit of the early F33A's is the CG and payload superiority. It is a bit of a "Goldilocks" situation. The maximum takeoff weight was increased thanks to higher engine power, but before heavy components made their way into the specification list. Later-model F33A's are notorious for having difficulties carrying even one adult passenger (or heavy cargo) in the rear seats before the CG moves too far aft once fuel is burned from the tanks. This can be attributed to avionics components mounted in the tail and heavier interiors and insulation. I have seen it said on forums that any F33A with an empty CG forward of 81 is desirable. The empty CG of 1RW is at 79.6.

Add on the tip-tanks that were recently installed (further increasing the max takeoff weight from 3,400 lbs. to 3,600 lbs.) and we have a useful load of 1,446 lbs. which leaves us a full fuel payload of 762 lbs! To put all of this into layman's terms, we can take four average adults, 80 lbs. of baggage, fly 7.5 hours, and remain completely within the weight and CG envelope. For later model airplanes, there is almost no amount of money that you can throw into the airplane to correct the aft CG issues. Our seller was so proud of the CG and useful load that he put it directly in the listing because it is a true selling point for people who know what they are looking for.

The ownership history of 1RW was also a huge selling point. For 37 of its 50-year history, the aircraft was owned by a chief pilot of a large flight department. This owner clearly knew

how to take care of an airplane based on the impeccable maintenance logs. In addition to regularly overhauling/replacing the routine wear items, consistent and frequent upgrades were made to the airplane. Throughout the years, nearly every component of the aircraft was addressed: engine (from the original IO-520-B to the -BA with heavy crankcase and VAR crankshaft upgrades, cooling baffles and GAMIjectors) paint, interior, engine monitor and fuel totalizer, thick windscreen and windows, and of course, avionics. The most recent owner continued the trend by adding D'Shannon 20-gallon tip tanks and engine floorboards, a full outfit of exterior LED lights, a Garmin G5 standby display (allowing for the removal of the vacuum system), and an upgrade to the Aspen Evolution 1000 PRO MAX PFD.

Big-ticket upgrades are easy to pick out from an aircraft listing, but actually being able to lay our hands on 1RW and get to know its owner and history led to a great gut feeling that ultimately helped us make the big purchase decision – a feeling that was confirmed when the pre-buy inspection report came back with only minor suggested repairs.

Only the Beginning

Our journey into aircraft ownership has been well documented in T&T Editor's Briefings to this point, and we have only just begun. Stay tuned as Rebecca and I continue to provide updates and insight behind the joys (and hopefully limited trials) of our experience. We are confident these articles have the potential to inspire buyer's rejoice for seasoned and aspiring owners alike! T&T

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

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DATING OUTSOURCED

Q&A WITH **APRIL DAVIS,** FOUNDER OF **LUMA LUXURY MATCHMAKERS.** APRIL SHARES HER INSIGHTS ON TODAY'S DATING SCENE & HOW TO FIND THAT DIAMOND IN THE ROUGH.

APRIL DAVIS
PILOT &
MATCHMAKER

What's the Dating Scene like during these COVID times?

People are looking for **real relationships** and connections now more than ever. The isolation occurring as a result of Covid has made people realize their **priorities** & they're valuing **true connection**. They want to be with that one person they can go through the hard times and the pandemic with.

How are people meeting and going on dates?

A lot of people have turned to technology and are using **Facetime** and **Zoom** to do that initial date. We help our clients learn to use these apps and leverage **best practices** to ensure they look & sound good in the video. After that initial video date(s), many people then **meet up in person**. Everyone has their own viewpoints so it's important to **communicate** concerns.

Why do people use LUMA's services?

Did you know that only 5% of relationships start online? (PEW Research) Sometimes it just makes sense to **outsource** certain time-consuming or difficult tasks... Such as finding your match. We introduce **selective** people to matches who share similar **values**, **interests**, and future **goals** and plan curated dates for each of our couples so you can just relax and have fun. Just think of LUMA as a personal **Wingwoman** who can introduce you to your perfect **match**.

What are people looking for?

Attraction is always the #1 for people, but they want more than that. They want someone they can have **fun** with, have shared **values**, and can go through this pandemic **together**.

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Trying to Make It Work

"Hey Dad, my friend Curt and I are going fishing south of New Orleans in a couple of weeks."

"Are you driving?" I asked Matt. "It's a seven-and-a-half-hour trek from Dallas. How about I fly you in the King Air?" "Wow, that would be fantastic," came the quick response.

I reviewed the forecasts. A low-pressure system was developing in southeast Texas.

Picture 1, taken the night before departure, showed an area of potential scattered thunderstorm development over the route of flight but nothing ominous. The destination, KMSY, had a forecast of 5 miles visibility in fog and a ceiling of 300 broken. Along the route, only rain showers were forecast.

I woke up the next morning to a much different scenario. Picture 2 of lightning strikes got my attention. Taken at 6:54 a.m., it was followed by Picture 3 showing two convective SIGMETS with tops to FL450.

The C90A is a great airplane, but like me, it is vertically challenged. There was no way we were going to go over this weather. How about around it?

Picture 4 indicated my planned ForeFlight route might be possible. But the weather system was moving northeast at 30 knots and intensifying over Houston. I knew that the Houston storms would be over my route about the time of my scheduled 10 a.m. departure. Going around the system would take a huge deviation, and I had to return to Dallas Love (KDAL) right back through the weather. How about the lightning situation? Picture 5 didn't ease my concerns…convective activity was increasing. An Airbus A319 reported severe turbulence at FL240 along the route. Numerous aircraft reported light icing.nd the afternoon forecast promised much of the same until well after dark.

I glanced at FlightAware to see what kind of aircraft were going through the weather. Only jets were trying. Not a single airplane with propellers. I texted Matt.

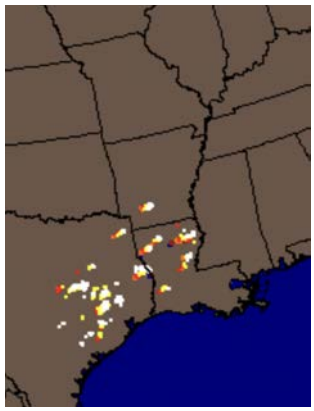
"I hate to tell you this, but I just can't safely get you to New Orleans today." "No big deal," he said. "Thanks for trying." They drove instead of flying. Picture 6 was taken at my scheduled departure time.

I felt defeated. I watched the weather all day. Did I make a mistake? Was I losing my edge? The weather did exactly as forecast. It stayed lousy. Sometimes the hardest decisions are the best ones.

Fly safe. T&T

Picture 1

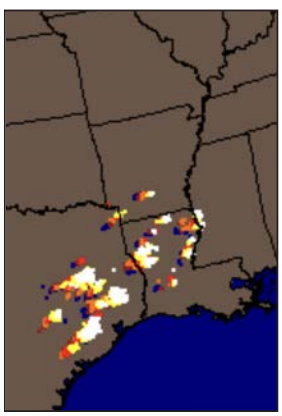
Picture 2



Picture 3

Picture 4

Picture 5



Picture 6

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**.

BEECHCRAFT GAVE IT LIFE. STEVENS GAVE IT A SOUL.

It had lived a reasonably ordinary life in the high plains of Texas until six lightning strikes ripped through this 1994 King Air 350. Instead of simply repairing the damage, the owner collaborated with Stevens to breathe new life into a classic airframe. From the Texas Tech-inspired paint to the rugged interiors that capture the authentic feel of a cattle ranch, this project reflects our passion to take a customer's idea and create something truly extraordinary.

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ROSES AND RAVENS IN FLIGHT

Duncan Aviation recently commissioned a design for the company-owned Citation 560XLS from world-renowned artist Nancy Friedemann Sánchez, a Colombian-American contemporary artist. The design was brought to life by the aircraft artisans of Duncan Aviation.

WATCH THE TIMELAPSE:
www.DuncanAviation.aero/ravens

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