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What Price Security?

On the night of March 30, 2003, Chicago's Mayor Richard M. Daley directed an act of domestic terrorism by surreptitiously bulldozing the runway at Meigs Field, ending a long-running debate over maintaining convenient general aviation access to the City's downtown. His excuse, at one point, was that his act was necessary for security reasons. In the spirit of 9/11/2001, he held that Meigs simply made it too easy for crazed individuals to launch an aerial attack on his city.

Aviation stakeholders, outnumbered as they are by power-wielding non-flyers, frequently have to suffer arbitrary inconveniences devised in the name of "security". At a otherwise-welcoming small city's airport I visit, I must wait to be "buzzed" through the FBO's door to get back to my airplane, simply because there is an airline terminal located two miles away across the airport. Almost everywhere, chain link fences and controlled-access gates deter the next generation of would-be pilots from hanging out around airplanes.

Even visiting FAA facilities for an informal cup of coffee has become difficult, as Flight Service Stations have become automated and control towers are moved off the ramp and into remote-fortress locations in the airport's farmland. I used to be able to walk into my General Aviation District Office and see if one of my inspector friends was free for lunch. After 9/11, FAA Flight Standards District offices went into full lockdown mode, behind metal detectors, security guards and service-by-appointment.

Washington, D.C., "Seventy square miles of logic-free environment," as labeled by my favorite Congressman, tries to be the most secure locality in the world, a place where purse contents are routinely stirred by building guards and bottles of drinking water are considered suspect. Washington airspace, of course, is held sacrosanct, requiring all manner of special training and preparation before considering entry to even the suburban perimeter. Residents of this bastion take comfort in knowing that unauthorized aircraft cannot penetrate the designated no-fly airspace; they're still nervous from being targeted by terrorists fourteen years ago.

Meanwhile, pilots intuitively recognize the futility of regulatory restrictions. Bad guys could care less what it says on a navigation chart. As a protester with an unregistered gyrocopter proved last month, a sudden aerial arrival that disregards the rules can evade most preparations. A dedicated terrorist, against whom our pages of procedures were supposedly devised, or a protester who's willing to accept the penalty, simply disregards locked gates and printed prohibitions.

In the world of general aviation security, much of what we have was foisted upon us by well-meaning, but unknowledgeable, individuals responding to cries of "Do something…make sure this never happens again!" Aviation lobby groups try to talk sense into rule-makers, but our limited numbers often result in having to accept a compromise, just to keep some of our rights. We shouldn't let up, however. When you discuss aviation security with lay individuals, try to let them know that their security begins with us; we are the ones on the airport, watching for suspicious activity and observing comings and goings. Pilots and owners know what works, and what doesn't.

In the final conclusion, the only truly secure skies are in the totalitarian countries, where only the rulers' military has wings. As the incomparable Benjamin Franklin wrote in 1755, "Those who can give up essential liberty for a little temporary safety deserve neither liberty nor safety."

LeRoy Cook.
Editor

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Upgrading to a New Citation

To a Citation jet owner, more is always better. The choices in the Cessna Citation family are varied and plentiful; from Mustang to Citation X+, each one offering varying amounts of speed, seats and style. A few more nautical miles of range, increased cruise speed, better avionics – there's always something to be gained by trading up.

Stuart Fred, a Houston, Texas-based commercial real estate entrepreneur, is highly knowledgeable when it comes to the Citation family. He's owned several Citations, flown most of the competitors and has logged more than 4,000 hours in jets, including time in a pair of Aero L39 Albatros trainers he owns. His business interests are scattered all across the southern half of the United States, making fast, capable travel a critical part of his success. His CJ's have helped him keep on top of managing properties throughout the growth of the Bomasada Group, of which he's President.

Fred grew up fascinated with airplanes, darting out the door, like a lot of us, whenever one flew over. His obsession was indulged by his parents, and he mowed lawns and saved money after paying the $5 introductory flight Cessna was offering at Cruise Aviation on Hobby Airport in Houston, starting lessons at age 15. Nine months later, he soloed at 16. After college, he worked his way up the ownership ladder from a Cessna Cardinal to a Piper Arrow IV and then to a normally-aspirated 1979 210 Centurion, a fine traveling companion that he only recently sold. He credits his first instructor with the creed that has helped him make the right piloting decisions throughout his flying career; "Stuart," his instructor would say, "if there's any doubt, there's no doubt."

"Heeding his advice, I still occasionally cancel trips," Fred says. "Primarily, if I'm not comfortable with the forecasted weather and with being able to complete the flight safely and comfortably for my passengers or myself, I'm simply not going."

The Route To Jets

Fred's journey into jets grew with the company he founded; he acquired a multi-engine rating in a Baron at Lakeside airport in Houston, flew a Cessna 310 and 421, but knew that something more capable was needed if he was to maintain his travel schedule. He took a production slot for one of the first Citation Mustangs, but bought a CJ instead, later moving to a CJ1 and eventually to a CJ3, which he flew for seven years.

"The CJ3 was a different world, compared to the smaller CJs, allowing me to tanker fuel for round trips to the East Coast, rather than fill up at every stop." He could now buy 100 gallons of Jet-A and return home, where the company has its own fuel facilities. An opportunity to sell the CJ3 presented itself, so

CJ4

Fred stepped back to a new CJ2+ for a while. The needs of the business required more capability, however, and the CJ3+ was considered, but he decided that a CJ4 made the most sense.

Stuart Fred took delivery of the new CJ4 in early 2015, and couldn't be happier with his choice. "Systems-wise, it's just a lot more capable aircraft. The electrical system is practically failure-proof, with two alternators added to the two starter/generators, and the 3,621 pounds/thrust Williams FJ44-4A FADEC engines offer the highest thrust-to-weight ratio of all the Cessna Citations. It has single-point fueling, electrically-heated windshields, an externally-serviced lavatory, a 3,000-psi hydraulic system and most importantly, the Collins Pro-Line 21 panel with one more display, a very robust, capable four-tube avionics system."

Because the bigger, swept-wing CJ4 can still be flown with the same C-525 type rating, a two-day differences course at FlightSafety was the only additional training requirement to be met. However, Fred adheres to a six-month recurrency schedule, like the airlines, and firmly believes in regular FlightSafety International visits. At this point, FSI's Wichita Learning Center is home to the only CJ4 simulator.

Putting The CJ4 To Work

The CJ4 is used for both personal and business flying. Fred can load up four to seven people with bags and fly 1,900 nautical miles with reserves. His average trip length is about 1:45, perfect for the typical four-passenger load. Fred's CJ4 is fitted with eight seats in the cabin. Even so, Fred says a 4,000-foot runway is adequate; "if you adhere to the numbers within the AFM, you're good to go. The airplane delivers the numbers the book says."

The best working altitude is FL43-450, which can be justified for flights of 1:15 or longer, burning 980 pph at altitude, and staying five knots under the barberpole delivers a TAS of about 425 knots. Down lower, the CJ4 can be cranked up to more than 450 knots, but at a much greater fuel burn. Mmo is a very non-CJ-like .77 Mach, thanks to 12.5 degrees of wing sweep. On a typical trip of 900 nautical miles,

the CJ4 will consume 400 pounds more fuel than the CJ2+ does, but will get there 20 minutes quicker.

At 17,000 pounds, the CJ4 is just a bigger, more solid airplane than its predecessors. The entry door is wider than the other CJs, designed to hold pressurization without an inflatable seal, and a four-panel variable-opening speed-brake system is available to control descent. And it offers a significant advance in systems, as the CJ4 was a clean-sheet design, not an upgrade of the CJ airframe. The cabin is 20 inches longer than the CJ3's, and slightly wider as well, thanks to Cessna's redesign of the interior. The airplane is just a significant step up as compared to the CJ lineage, Fred says, with nicer interior finishes and cabinetry. The airplane is sometimes referred to as a "Baby Sovereign." Fred praises the wonderful support from Cessna, including, at the top of his list, the Mobile Service Unit that can be dispatched to an AOG customer anywhere in the U.S.

The CJ4 was created to give light-jet buyers a fresh upgrade option, positioned right below the smallest mid-size general aviation jets but with comparable capabilities. The first small Citation with a swept wing, the new airfoil has 12.5% more area than the CJ3's and holds 1,100 pounds more fuel. NBAA-reserves range is a bit over 2,000 nautical miles and that's with max-cruise power at FL450.

How's It Fly?

Handling-wise, upgrading CJ4 pilots can expect more of the same CJ mannerisms of the smaller models. There's a stick-shaker, but no pusher, thanks to mild

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stall characteristics. The trailing-link main gear design delivers consistent smooth touchdowns, compared to the original Citation's stubby legs. The CJ4's gear span is narrower than the broad stance of earlier CJ's, which is beneficial on restricted taxiways.

The cockpit retains the Citation look, with big yokes mounted through the floor. The pedestal is short, containing power levers, the spoiler and flap handles, and an array of trim switches; there's no manual pitch-trim wheel. As with most newer general aviation jet designs, the CJ4 has a simpler, cleaner cockpit, with fewer rows of circuit breakers and annunciator lights. Most abnormalities are displayed via a CAS message, presented on the ProLine 21 displays in plain language.

Starting is push-button easy, entirely automated, and steering and braking is still pedal operated; the brakes are powered by a separate hydraulic system from the gear and speed brake/ground spoiler system. Expect CJ-like runway performance numbers, even in the bigger CJ4; max-weight V1 is 102 knots, with V2 at 116. And climb it will; at 240 knots, the CJ4's climb rate is over 4,000 fpm. Be careful to get the gear up before its operating limit speed of 200 knots is exceeded, as the airplane accelerates quickly.

On approach, full flaps can be selected with IAS as high as 160 knots, using the incremental speed brakes as needed. Vref numbers are typically just over 100 knots, more if heavy, less if light. Cessna engineers have managed to keep the CJ4's standard-day runway requirements under 3,000 feet, thanks to anti-skid brakes and six panels of ground spoilers, actuated by the speed-brake lever.

Stuart Fred's latest CJ is the best yet, by most accounts, taking this most recent of the Textron light jet series in a direction far removed from its predecessors. It's a great ride. T&T

Twin Proficiency:

by **Thomas P. Turner**

They Both

In most twin-engine airplanes, fuel management is simple. Each engine's fuel selector often has three positions: ON, OFF and CROSSFEED. CROSSFEED is an emergency position, for use during extended single-engine operation to maximize range and balance fuel when one engine is shut down. Consequently, the fuel selector typically remains in the ON position.

Some airplanes have auxiliary fuel tanks, resulting in a fourth valve position: AUX. In every airplane I've encountered, independently-selectable auxiliary fuel tanks are POH-limited to cruise flight. That adds only a little complexity to the task of fuel management: take off with the selector in ON or MAIN, switch to AUX at some point during cruise, and return to ON before descent and landing.

Regardless of your airplane's fuel system specifics, one thing seems obvious: both engines need fuel in order to run. Since you generally start one engine right after the other, the engines usually burn fuel at approximately the same rate, and we usually load the same amount of fuel into each wing, for symmetry. One engine starving for fuel is way down on our list of things to worry about.

Yet, it happens. What are some of the unusual scenarios that result in exhausting one engine's fuel supply, while fuel is available to the other? What strategies are suggested by studying these events?

From the NTSB:

The pilot of a Beechcraft Baron E55 noted an imbalance between the left and right main fuel tanks during cruise. He attempted to correct the imbalance by placing the left fuel selector in the crossfeed position, so both engines would receive fuel from the right main tank. About 15 minutes later, both engines lost power. When the pilot reset the left and right fuel selectors to the left main and the right auxiliary fuel tanks, respectively, the left engine regained power and the right engine began "surging."

The pilot decided not to shut down the right engine and diverted to the nearest suitable airport. During final approach, the right engine lost power completely, and the airspeed decayed until it approached the airplane's minimum-control airspeed. When the airplane drifted right of the runway centerline, the pilot reduced power on the left engine in an attempt to maintain control. The airplane impacted an open field near the runway and a post-impact fire ensued.

Post-accident examination revealed no airframe or engine anomalies consistent with a pre-impact mechanical failure or malfunction. Both fuel selectors were positioned to their respective main fuel tanks. The pilot stated that the airplane was fully fueled before departure. He stated he had not used any of the fuel in the auxiliary tanks before the loss of engine power. The pilot's operating handbook notes that the crossfeed system is not to be used to transfer fuel from one tank to another or to balance fuel during flight. The simultaneous loss of engine power while both engines were receiving fuel from one fuel tank, the restoration of power on the left engine after switching fuel tanks, operation at or near the endurance limit for the right main tank, and the lack of anomalies identified during the engine exams are consistent with exhaustion of fuel in the right main tank.

NTSB probable cause: The pilot's failure to maintain airspeed and subsequent loss of airplane control during a single-engine landing approach. Contributing to the accident was the pilot's improper fuel management during cruise flight, resulting in an initial loss of power in both engines and the subsequent single-engine approach after power was restored on only one engine.

From the NTSB:

Toward the end of a 6 hour, 20 minute flight, during a night visual approach, the pilot of a Cessna Conquest flew the airplane to a left traffic pattern downwind leg, lowering the landing gear and setting the flaps to 30 degrees. He turned to a left base leg and, after doing so, was heard on the CTAF stating that he had an "engine out."

The airplane then passed through the final leg course, the pilot called "base to final," and the airplane commenced a right turn while maintaining altitude. The angle of bank was then observed to increase until the wings became vertical, then inverted, and the airplane rolled into a near-vertical descent, hitting the ground upright in a right spin.

Subsequent examination of the airplane and engines revealed that the right engine was not powered at impact, and the propeller from that engine was not in feather. No mechanical anomalies could be

Need Fuel

found with the engine that could have resulted in its failure. The right fuel tank was breeched; however, fuel calculations, confirmed by some fuel found in the right fuel tank as well as fuel found in the engine fuel filter housing, indicated that fuel exhaustion did not occur. It is unknown if or how much pilot fatigue might have influenced the outcome.

NTSB probable cause: The pilot's failure to maintain minimum control airspeed after a loss of right engine power, which resulted in an uncontrollable roll into an inadvertent stall/spin. Contributing to the accident was the failure of the airplane's right engine for reasons that could not be determined because no preexisting mechanical anomalies were found, and the pilot's subsequent turn toward that inoperative engine while maintaining altitude.

From the NTSB:

The Cessna 402B was approaching the destination airport with about seven gallons of fuel remaining in each of the 50-gallon main fuel tanks. While on short final, as the pilot fully extended the flaps, the airplane experienced a total loss of power on the right engine. The airplane touched down hard on a grassy area about 650 feet before the runway, bounced onto the runway, and came to rest. The pilot subsequently started both engines and taxied to the ramp area uneventfully.

A post-accident examination of the airplane revealed that the right main fuel tank's fuel transfer pump was inoperative. The fuel transfer pump was designed to operate continuously when the battery switch is on. The purpose of the pump is to transfer fuel from the nose section of the tank to the fuel pick-up area near the center of the tank, which permits steep descents with low fuel quantity. It could not be determined when the fuel transfer pump failed; however, confirming pump operation is a required preflight inspection item for each main fuel tank.

NTSB probable cause: The failure of the right main fuel tank transfer pump, which resulted in a total loss of right engine power during approach due to fuel starvation, and a subsequent hard landing. Contributing to the incident was the pilot's operation of the airplane with a low fuel quantity.

Let's look at some commonalities in these three scenarios, and explore some strategies to avoid finding yourself in similar circumstances.

Common Elements

Low fuel level. It sounds redundant to say that fuel exhaustion was due in part because the fuel level was low, but work with me: in these three events, the pilot was knowingly operating the aircraft to the extreme of its fuel endurance. In the case of the Conquest and 402B, it appears the pilot intended to stretch the airplane's range to its limits. In the Baron, some unusual situation led to detection of a fuel imbalance, and the pilot flew the airplane into a limited-fuel condition.

Lessons from this: Don't assume that mathematics, and even your knowledge of the fuel system, will precisely predict results in actual flight. Concepts of unusable fuel and regulatory fuel reserves are designed to give us a little "wiggle room" if actual conditions differ from what we expect. If you're operating near the maximum range of the aircraft ("maximum" may be revised if something unusual happens en route), be spring-loaded to divert to a nearby airport if you cannot positively verify the amount of fuel remaining through multiple, independent means.

Airplane limitations. Airframe and systems limitations are almost always the result of known and documented issues that stem from the aircraft's design–often accentuated by examples in the NTSB record.

The Baron pilot apparently adhered to the fuel system limitation, at the last minute, because both selectors were found on their respective main tank. Perhaps he switched before the engine quit and exhausted the remaining fuel in that tank. It's possible the engine failed while burning from the auxiliary tank, and he switched to the main tank as part of a restart attempt.

In the Conquest, the right engine did not completely empty its tank, but the fuel level was apparently pretty low. It may be that a common fuel system limitation was a factor–to avoid slips when the fuel level is below some level. More correctly, this condition is problematic when making an uncoordinated turn, when a low fuel level can "slosh" away from the fuel lines.

The Cessna 402B's case should have been obvious before takeoff. An inoperative fuel transfer pump is a "no-go" item in these airplanes. If the pilot performed the pre-takeoff check, and assuming the pump failure did not occur at some time during the accident flight, he should have aborted the flight. Good

fuel system knowledge would tell him there's a real reason to avoid departing with an inoperative transfer pump, especially if flying to the maximum endurance of the airplane.

Loss of control on one engine. Regardless of why an engine quits, it's vital to apply proper control inputs to establish and maintain control. Much multiengine training focuses on controlling the airplane through the initial stages of an engine failure, including feathering the correct propeller. Less time and training effort, typically, is spent on single-engine approach and landing. A few trips around the pattern with an instructor, with one engine in zero-thrust from downwind to landing, simulating engine-out configuration, can remind you of what's important after an engine quits.

Fuel leaks, blocked fuel vents, loose fuel caps, unexpected variations in fuel burn, and asymmetric fuel loading can cause one engine to run out before the other…unexpectedly. Attempting extreme-range flight, with uncoordinated flight during turns in the pattern, can unport a fuel tank and cause one engine to quit. Mechanical failures with fuel transfer and delivery systems can make an engine fail suddenly.

It's possible to have fuel exhaustion on one engine while fuel is still available to the other. Watch for the unusual situations when this may occur, and land early if you suspect it may be happening to you. T&T

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

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The GWX 70 Garmin's 21st Century Radar

Garmin now has a truly modern airborne radar. Back in 2006, the company introduced its GWX 68, which was, in several respects, far ahead of its time. However, it was designed on the chassis of a much-older radar, which had actually started life as a King Radio product. The new GWX 70 is a clean-sheet design by Garmin's radar engineering staff, under the direction of Joel Andrews.

The major item making it a 21st -Century radar is that it's engineered around a solid-state pulse generator. Solid-state is a 70-year leap forward, compared to the traditional coaxial or strapped vane magnetron pulse generators of most other radars. Why is this solid-state device so great? First and foremost, frequency stability. The old magnetrons, conceived by the British before WWII, spewed out a garbage of frequencies. Consequently, radar receiver gates had to be wide to hear that mess, then to work hard to pick out their own pulses from all the static – their own voice, as it were. Not so with the solid-state device. It can easily hear itself and ignore all the other chatter and static in cyberspace. As a result, transmitted pulses can be sent out with greatly-reduced power. Instead of the common 5,000 to 10,000 watts of the old days, a mere 40 watts will do with the GWX 70. It has to work a lot less to do its job.

Since it can hear better, the result is a crisper-appearing echo. Not much, but it's there and the boundaries of each color are more exact. Plus, for your pocket book, solid-state is far more reliable than the heavy old magnetrons, meaning fewer shop visits and expense.

In truth, solid-state pulse generators are not that new; they've been around for 50 years in military radars and Collins introduced them in airline-category radars 30 years ago. But, the GWX 70 is the first to employ the device in radars for singles, light twins and smaller jets.

Is there no downside to it? Yes. For a low-wattage solid-state device to send a usable pulse out beyond 90 or so miles, transmission times per pulse must be much greater. To overcome that, Garmin's engineers used "pulse compression" on the GWX 70, an engineering trick for making a pulse of radar energy act like it's shorter than it is. Again, it's ancient high-tech engineering, used in military radars for years, but this is a first for low-end civil radars. On the GWX 70, when a long range is selected for viewing, pulse compression shrinks the echoes down to just a mile in "range smear." Were it not for pulse compression, echoes would be smeared out to six miles, front to back, making it almost impossible to differentiate weather echoes from terrain when a long display range is selected. Another plus for the advanced engineering that Garmin's engineers applied to the GWX 70.

Beyond that, the GWX 70 has the usual me-too "features" that have been added to civil airborne radars, by first one then another radar manufacturer, over the past 30 years; integrated R/T/A section from Bendix in the late 1970's, "WATCH", an adaptation from Collins' ancient "PAC" and Honeywell's "REACT", and "Doppler Turbulence Detection," another oldie that Garmin is promoting as though it's totally new and unique, although it was first introduced by Collins far back in the last century. Most all experienced pilots consider Turb Detection interesting, but useless.

Garmin has even expanded "Doppler" to create a "Ground Clutter Suppression" feature, which has been around, but not really working as claimed, since the Collins WXR 850 of 1985. (Just why terrain features must be suppressed is a mystery anyway; pilots who can't tell the difference between weather echoes and ground detail, and use that detail for enhanced safety, haven't got enough gray

matter between their ears to be pilots in the first place.)

The GWX 70 has another feature that taps into Doppler: "Altitude Compensated Tilt". No doubt, it will be made much of by Garmin salespersons, but it's not just worthless, but misleading. Actually, all radars have "Auto Tilt" – a "Parked Position", as it were. It's simply with Tilt set at 0° with 10 and 12-inch antennas and -1° with an 18-inch one. (Incidentally, Garmin's "ACT" requires a GPS input to function.) It's called the "parked" position for tilt and is necessary to see radar shadows, which is a positive indication of where the storms are relative to terrain objects.

The GWX 70 has "Extended Range STC", adopted from the ancient Sperry line, another ancient engineering hocus-pocus that's simply a reduction, a miscalibration, in the thresholds for the colors beyond 40 or so miles. The result is red echoes that aren't really red now but will be when you get closer to them. It's of benefit only for ill-trained pilots who don't understand that radar energy gets weaker the greater the distance from the source, just like a light gets dimmer the greater the distance from its source.

GWX 70 engineers did pick up a major safety feature along the way: Vertical Profile, an innovation added at Bendix/King in about 1985 and picked up by Garmin for its GWX 68 and 70. VP may be the most valuable new radar feature since flat-plate antennas. Scanning the vertical structure of a storm reveals much about the hazards within it. For example, when there is an echo aloft but nothing below it, or only a weak return down low, you're looking at a very high risk of having millions of tons of water suddenly dropping on your head. Don't ever fly under it. Of all the gizmos that have been added to radars over the years, VP is the only feature that actually increases safety.

Another very useful carry-over from older radars is Sector Scan, which has been around for eons. But, beginning with their earlier GWX 68 radar, Garmin added an enhancement that makes it 10 times more useful than in pre-21st Century times. That feature is now carried over to the GWX 70 as "Variable Sector Scan", meaning you can cause it to scan a smaller sector, down to only 20°, and at virtually any direction you choose. Most likely, only professional aviators will appreciate it, but the ability to choose a Sector Scan down to only 20° and to move it to any of many different sectors is outstanding.

For starters, Sector Scan results in a greatly-increased display update rate. Helicopter operators, who tend to use radar more for navigation than for weather, will just about swoon over it on rainy, foggy nights when trying to pick up a hospital rooftop. And it'll make navigating to the landing pad on an offshore rig much less sweaty for the petroleum guys and gals. Garmin's version of Sector Scan is a bravo addition.

In a left-handed sort of way, Garmin's engineers also deserve a big thanks for making it simple to overcome a major fault on all the newest radars. Missing on the GWX 70 is magenta symbology, to indicate an extremely vicious storm. That's no fault of Garmin's. Ten or so years ago, an FAA/RTCA Committee, most likely egged on by radar manufacturers' legal departments, decreed that magenta may not be used to warn pilots of extreme hazards. Why? Because it's needed for course lines and such on EFIS displays. Their logic was most likely an assumption that pilots need only see red to know there's a hazard and turn tail. But pilots must also know what *degree and kind* of hazard a storm presents. Without that knowledge, how are they to decide how much circumnavigation distance is prudent?

Fact is, when you see red in an echo, research data tells us only that it's raining, period. Seventy-percent chance is, that red echo's only a rain shower. However, to make safe avoidance decisions, pilots must know if it's just light rain or a gully-washer type deluge. And is it only rain, or is it water turned into hailstones? If the latter, are the hailstones small or large? The old magenta, now seen only in course lines on your EHSI, revealed all that. But, the bureaucrats have taken it away from us.

Fortunately, there's a way to fool the GWX 70's four-color display into revealing all those critical facts about a thunderstorm. Since radar engineers mess with color calibration to achieve "Extended Range STC," pilots can do a similar thing to switch the mandated four colors into, in effect, five colors. (Bless the Garmin engineers for making it so easy with their CAL control and display.) The GMX 70

calibration is such that switching from WX to MAP mode causes red to switch to deep blue. So, when you see a red weather echo, switch to MAP for a sweep or two. If deep blue isn't in that echo, it's only a shower. If you see *any* blue, even a little bit, it's a thunderstorm of at least Level 4 intensity. Add a mile or two to the circumnavigation distance.

What's the major thing to not like about this radar? It's another standard fault with all other manufacturers' radars since about 1975 (the only exception being the Honeywell Primus 440/660/880 series). It has various names, ranging from XXX to WATCH, and it's an attempt to cause radars to compensate for the attenuation behind an echo. Common logic tells you that a thunderstorm tucked behind a thunderstorm, or detected through rain, will appear weaker than fact.

So, in searching for new and wonderful features, a bright young fellow came up with a scheme to correct attenuation, many years ago. When the idea was presented to a wise old engineer at RCA named George Lucche (before it became Honeywell), he demonstrated that it doesn't work as theory says, and can even cause echoes to become miscalibrated when a terrain object is detected. Therefore, Honeywell's Primus series radars (offshoots from RCA) have an OFF switch on their REACT; Garmin's WATCH on the GWX 70 doesn't. So, the GWX 70's feature can cause echoes to be miscalibrated under certain conditions. Fortunately, that misrepresentation is to the safe side, and is only a factor on echoes inside about 35 nm.

Second possibility, if you want to determine whether it's merely a thunderstorm or if it's a hail-producing bugger, when you see red in WX mode, reduce the Cal control down to about 1/2 scale. If any red remains, assume it's producing large hail and avoid it by a minimum of

10 nm upwind, 20 nm downwind – and those distances are from *all* parts of it, *green as well as red*.

Compared to other radars that do not display the fifth color, magenta, the ease with which the GWX 70 can be, tricked, – miscalibrated – into revealing Level 5 and 6 echoes is a meaningful and positive safety feature.

One downside to that: The procedure requires careful tweaking of the Tilt and Cal controls. But, the GWX 70 displays on one of Garmin's several MFDs. (At prices ranging from $16,000 to $30,000 extra – free if it comes with the new aircraft.) On any MFD, radar controls are timeshared with levers, switches, buttons and knobs put there for other purposes, many of which aren't remotely connected with radar operation.

Therefore, to tweak Tilt and Cal as necessary to sort out rain showers from bad storms, one must first switch knob and button function selections, which requires punching and turning odd things put on the MFD for other than radar use. (For instance, Tilt selection on the prototype unit we flew worked backwards from logic; to raise Tilt you pushed *down* on the lever, to lower tilt, lift the lever *up*.) As a result, those with fat fingers, twitchy digits and/or who tend to become flustered in panic situations, may have big fumble-finger problems. The advice is to practice, practice, practice. Which, in fact, is critical advice when operating any radar.

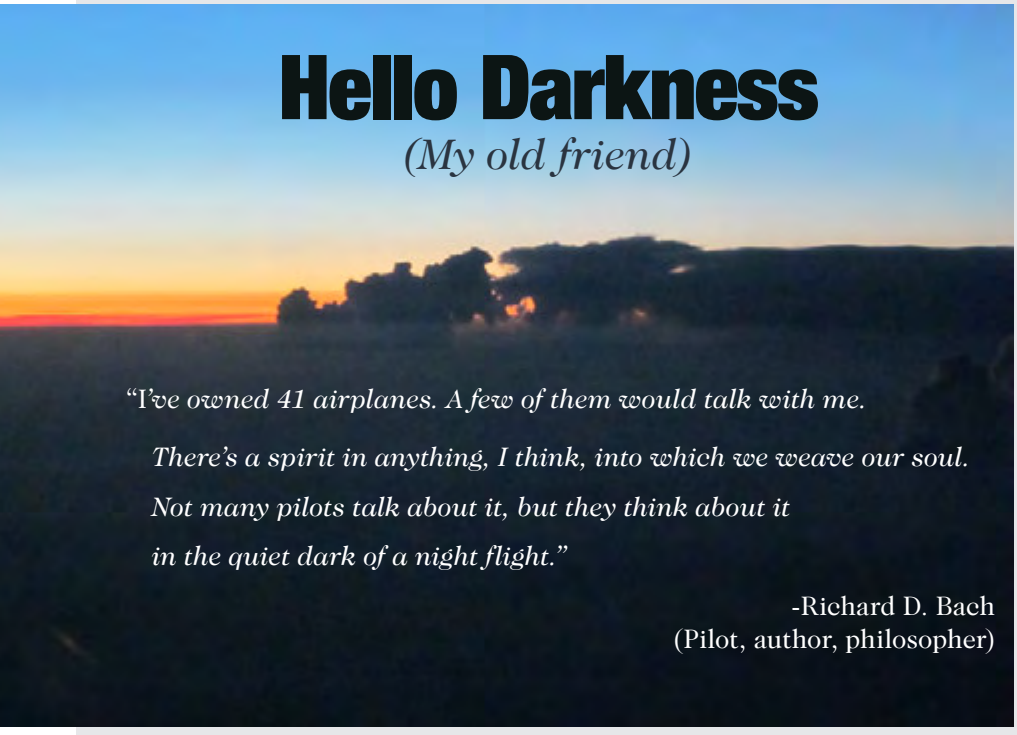
Summing up, Garmin's 21st century radar is indeed a step forward into another era. At only $22,995 (plus MFD) it has all the features of a 20th century radar, including several worthy ones from Garmin's earlier GWX 68, plus a solid-state pulse generator, pulse compression for superior echo detail at all ranges, greater reliability, lower maintenance costs, reduced weight and, perhaps most important of all, greater bragging rights over owners of last century radars. T&T

Archie Trammell's credentials are 34 years as an instructor and lecturer on airborne weather radar and convective storms avoidance. His clients have included most major airlines, all five military services and numerous government agencies, including the FAA, NASA and NTSB. His research has been exhaustive and has included more than 4,000 hours of inflight thunderstorm research, both in his own aircraft and from the jump seat for airline clients. He's a pilot and CFII, with much twin and turbine experience. His monthly web site, www.radar4pilots.com, has been up monthly since May 2005.

by **Kevin R. Dingman**

Hello Darkness

(My old friend)



"I've owned 41 airplanes. A few of them would talk with me.

There's a spirit in anything, I think, into which we weave our soul.

Not many pilots talk about it, but they think about it

in the quiet dark of a night flight."

-Richard D. Bach
(Pilot, author, philosopher)

You may tell people that you don't fly much at night because you favor the panoramic view of a sun-swept vista, that you can see other airplanes and weather more easily during the daytime, or you might simply mumble something about the troublesome night-landing regulation. Most of us have had contemplative moments while flying; many in the quiet dark. But it's no secret why the night column in your logbook lists a much smaller total than the day column: it's because The Boogie Man comes out at night and nothing good happens after midnight…… or does it?

We Don't Need Convincing

Most of us prefer to fly in the sunshine because we agree with these maxims. Certainly the sun-swept vista one, and we recognize the after-midnight adage as a hard-learned matter of record. And the Boogie Man is just another name for our fight-or-flee DNA that lets us imagine bumps in the night and "benefit" from our adrenal glands. In addition to the emotional justifications for flying when it's daylight, there is conclusive evidence that our bodies must be exposed to natural light at regular intervals to function properly. And the dangers of operating an aircraft on the backside of the clock – during the "sleep side" of our circadian rhythm – are undeniable. Okay, so we don't need convincing to avoid the dark. But, to deny ourselves the night is an unnecessary restriction on the utility of our airplane. The airplane doesn't care that it's dark; it's all about us, our senses and our adrenal glands. Night flying is simply another category of flying, like instrument, and should be treated as such. This includes training, proficiency and recent experience.

The FAR

No person may act as pilot in command of an aircraft carrying passengers during the period beginning 1 hour after sunset and ending 1 hour before sunrise, unless within the preceding 90 days that person has made at least three takeoffs and three landings to a full stop during the period beginning 1 hour after sunset and ending 1 hour before sunrise, and–…The required takeoffs and landings were performed in an aircraft of the same category, class, and type (if a type rating is required). The Fed's are a bit more clinical than Bach.

If you haven't flown for a while, it's common to be anxious. And, just as we feel behind the airplane after an absence, so it is when we fly at night. Two reasons stand out; we fly less often at night, and it takes more effort to gather and process information from our main sense, vision. As we get older, driving after dark requires glasses and slower speeds. And, for many of us, the issues we face while driving at night also apply to night flying: fatigue, visual acuity and depth perception. Additionally, reading charts, finding switches and avoiding weather are factors that change when we fly at night. There are advantages to the night, however; it's generally cooler, the ride is often better, there's less traffic so direct routing is likely, and, if the weather is good, you can see towns and airports from far away.

Unknown Unknowns

The first time I ever rode in an airplane was at night and it was great. During training for my private, I wasn't any more anxious at night than the day, and felt no more behind the plane than in daytime. Then, as a teenage private pilot, most of my flying was single-engine at night. It didn't seem more risky because I was bullet-proof, and the back side of my circadian clock was the same as the front side; when you're a teen, sleep is optional. All-night cross-countries were flown in every direction: Michigan to New York, Florida, Montana, Oklahoma and Colorado. I didn't know what I didn't know. Fortunately, I outgrew that no-risk, bullet-proof feeling and by the time I entered the Air Force, I had enough experience to know better.

When the USAF Pilot Training syllabus called for night flying,

my vision had deteriorated and I was wearing "corrective lenses" for distance vision. My instructor was from San Diego, so our night cross-country in the T-37 was from Phoenix to southern California. The T-37 cockpit lighting was quite poor and wearing glasses was disorienting. I was accustomed to them when the next phase of training in the T-38 arrived, making it less of a burden. In the F-16, we flew mostly during the day and our attention was directed at the HUD and outside of the jet. At night, along with the other nighttime visual perception considerations, there were issues with the air-to-air radar reflecting on the canopy. Other than that, visibility and night switchology was outstanding.

Not that the visibility out the pointy end of an airliner is poor, but it's very different from the visibility in a fighter and it's worse than many GA airplanes. Once away from the ground in the MD-80, looking outside is secondary to monitoring the ten-thousand gauges in the cockpit of this legacy (an affectionate way of saying older) airliner. Fortunately, the cockpits of most *T&T* airplanes are modern, well-lighted and have instrument clusters combined or arranged very logically; similar to a "modern" airliner. Even so, we face issues at night.

Old Friend

Having spent about 3,500 hours flying at night, the Boogie Man and I are old friends – though the affiliation was not always harmonious. I've had to land on an unlighted runway, I missed a taxiway at a tiny GA airport in the middle of the night, due to inop landing and taxi lights, and I got the nose stuck in soft ground. I have flown into a small, but towering, cumulus illuminated only by moonlight, had St Elmo's fire so thick I couldn't see through it and had a cloud-to-aircraft lightning strike in which a compression shock wave blew out the right motor. That's why some of the lights in the cockpit are labeled as thunderstorm lights, by the way. Not to keep from blowing out your motors; you turn them on and they illuminate the cockpit so as to lessen the effects of lightning flashes on our night vision. This allows us to see controls and switches after the flash, while we catch our breath or clean our shorts. Perhaps we should rename them "time-to-land" switches – if we need to use thunderstorm lights, we might rather be on the ground than in the air. Although, the most difficult portion of a night trip can be when we're on the ground, taxiing on large or unfamiliar airports. This is especially true during low visibility or when surfaces are wet and dark. Painted lines become invisible, making turns on a poorly-lighted taxiway difficult, and extra care must be taken to avoid incursions; all good reasons to slow our pace at night.

It can be enjoyable to depart in the pre-dawn darkness, on the front side of our circadian rhythm, knowing that the sun will rise soon. But an evening departure in which the sun has set, not to be seen for the duration of our flight and leaving us entering the back side of our clock, can be unsettling and present more risk if not prepared. The disadvantages of fatigue, loss of visual clues, and unfamiliarity with both the controls and suitability of artificial lighting, can become an overload if weather, low fuel or

an aircraft system malfunction develops. You could say that flying during the night and day are the same. You could pretend that you are bullet-proof and deny the existence of Murphy's Law, bad luck and the Boogie Man. Preparation and respect for the risks will temper the wrath of these demons, freeing us to enjoy the night….. and to contemplate; like Bach.

Reflect, Listen, Log It

Sit in your hangar with the lights off and re-familiarize yourself with the lighting controls of your airplane; you should be able to find things just as you can in the daytime–slow down and make the switch movements more deliberate. Make sure your navigation, landing and taxi lights, rotating beacon and/or strobes are working. Then, go do a couple of night full-stop or stop-and-goes at your home field before leaving the pattern. Next, venture out to an airport within thirty minutes or so and do another full-stop. Then, head home for the final landing; log it in the night column in your logbook. This warm-up will help prepare you for a two or three-hour night cross-country in which you may reflect, listen to the plane and, if it speaks to you, weave it into your soul. Perhaps good things can happen when we don't conform to the ritual of daytime flying.

Author's Note:

Richard Bach reported that the near-death experience of his plane crash inspired him to finish Part Four of his previously-three-part novella. In 2014, *Jonathan Livingston Seagull: The Complete Edition,* was reissued and includes Part Four. T&T

Kevin Dingman has been flying for 40 years. He's an ATP typed in the B737 and DC9 with 20,000 hours. A retired Air Force Major, he flew the F-16 then performed as a 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 Dinger10d@gmail.com.

EN ROUTE

Piper Aircraft Launches New M-Class Product, The Piper M600

On April 14, 2015, Piper Aircraft unveiled the newest addition to its esteemed M-Class line, the M600, a 600-horsepower, cabin-class single-engine turboprop. The Piper M600 is a significant product advancement, featuring a newly-designed wing, the most sophisticated Garmin avionics technology available, and a redesigned, luxurious interior. The M600 is the first single-engine turboprop to feature Garmin's G3000 avionics – a touchscreen-controlled glass flight deck.

The M600 seats six and is powered by a 600-shp version of the Pratt & Whitney PT6A-42A engine. To be available by the end of 2015, the aircraft is expected to match the M500's maximum cruise speed of 260 knots, and will have a payload of 1,200 pounds. The new wing, while similar in span to the M500's, will provide a fuel capacity of 260 gallons, versus the M500's 170 gallons, allowing a maximum range of 1,300 n.m., compared to 1,000 n.m. for the M500. The M500's radar pod under the right wing will be changed to one mounted on the wing's leading edge.

"Our customers and dealers asked for an aircraft with more payload and additional range," said Piper President and CEO Simon Caldecott. "We listened and we delivered. The M600 encompasses the most advanced safety measures available today in the most ambitious package, with an overall value proposition that is extremely compelling to corporate flight departments and individuals alike.

"With the advent of the M600, we have given our customers an option to travel nonstop from New York to Florida with added peace of mind afforded by the latest and most advanced safety enhancements," added Caldecott.

The G3000 avionics suite is the most sophisticated Garmin technology available and offers the most comprehensive, intuitive, and technologically advanced package on today's market. With the G3000, the mechanics of flight deck management are easier and more efficient by design. Integrating control of various radios, audio and intercom channels, transponder codes, checklists, charts, mapping, flight plan entry and other functions, the Garmin GTC 570 touchscreen controller provides a centralized point of access for the majority of all avionics tuning, selection, and data inputs.

The M600 interior features ergonomically-designed, aesthetically-styled seats, which have been optimized for comfort. Enhanced side panels were developed for improved passenger interface. Additionally, three new color palettes have been thoughtfully created with the customer in mind. A comprehensive survey process helped identify the features and attributes that would be most appreciated by both pilots and customers.

Other major improvements for the M600 include a new digital pressurization system, which fully integrates with G3000, the Aspen EFD-1000 standby instrument, electroluminescent placards in cockpit, GTX 33 Extended Squitter Transponder, a centrally located single audio panel, USB charging ports in both the cockpit and the cabin, and an optional GTS 825 Traffic Advisory System, which coupled with the GTX 33ES, gives the aircraft ADS-B In and Out functionality. M600 aircraft are also offered with the optional Garmin GSR-56 Global Satellite Datalink Iridium Satellite Transceiver for added connectivity, making the M600 the ideal business aircraft platform.

The 2016 M600 is to have a list price of $2.825 million.

Continued on page 26

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EN ROUTE

Piper Aircraft also debuted the single-engine Meridian M500 turbine business aircraft, which had been announced in January. As part of the Meridian M500 debut, Piper announced the availability of an Executive Interior option.

The M500 Executive Interior features an assortment of enhancements, including all new plush leather for the existing six-place club seating, the addition of new side panel accents, wider outboard armrests, new avionics panel trim, passenger interface improvements, and an entirely new color palate, including thoughtful accents in a beige and mocha finish. Set apart from predecessors in its class, the M500 Executive Interior uses the same luxurious accents and amenities from the cabin into the cockpit, creating a clean, consistent continuance throughout the aircraft.

Equipped with an improved Garmin G1000 avionics suite, the 2015 M500 is listed at a competitive price of $2,264,250.

For further information, visit *www.piper.com* T&T

Comments Needed On Flight Service Program Changes

Ever eager to cut costs and "eliminate redundancies and underutilized services", the Federal Aviation Administration has announced coming changes in the way pilots interact with Flight Service. Comments are being taken prior to implementation. Quotes from the announcement and T&T editorial remarks follow:

"On October 1, 2015, the FAA will consolidate Flight Watch services into routine … inflight frequencies to eliminate unnecessary duplication of service and provide greater convenience for pilots. These services provide inflight weather information to pilots. After that date, these services will be available on the same frequencies that pilots use to open and close flight plans and to receive updates on NOTAMs or Temporary Flight Restrictions (TFRs). Dedicated Flight Watch frequencies will be decommissioned."

This means pilots will have to hunt for an FSS frequency instead of just using the universal 122.00 or the high-altitude alternative. How is this "greater convenience?"

"The FAA is proposing to phase out legacy Remote Airport Advisory Service. Seven of the airports do not meet the Agency's criteria for receiving advisory service. Flight Service is collaborating with our user groups on possible impacts and will be posting the proposed change in the Federal Register for public comment."

While rare, the remote uncontrolled airports with FSS advisory service will see a decreased level of safety.

EN ROUTE

"The FAA is also proposing to implement flight plan filing for civil aircraft exclusively under the format used by the International Civil Aviation Organization (ICAO). Flight plans contain specific information relating to the proposed flight of an aircraft and controllers use them to provide air traffic services. Today pilots file flight plans in the U.S. under either the domestic or ICAO format. The use of one format will simplify the process and align U.S. flight plans within ICAO standards."

How does it "simplify the process" to require the more-complex ICAO flight plan? Why does the nation with the most successful general aviation system constantly have to adopt ICAO's confusing, restrictive ideas?

"General aviation pilots increasingly have turned to automation in recent years to file flight plans and receive pre-flight briefings. New technology such as ADS-B is providing more inflight options to pilots. Flight Service will incorporate the industry's newest technologies and reduce or eliminate other functions to create efficiencies and value…."

Beware of allowing FAA to off-load TFR and NOTAM dissemination to non-official sources; when charged with violation of FAR 91.103 "Preflight Action", pilots will be unable to prove the acquisition of information was from the FAA's current posted data. Historically, the FAA has continually abandoned its services to non-government providers, increasing costs to users and severing its links to the industry it regulates.

To send FAA your comments, questions, and suggestions and share your thoughts and ideas, use this link:

www.faa.gov/about/office_org/headquarters_offices/ato/service_units/systemops/fs/changes T&T

SPECIAL CITATION JET OWNERS SECTION!

Doing It The

By **Kevin Ware**

It's a cold, clear mid-winter morning as we descend out of FL430 in the Lear 40, crossing the Mississippi River in the vicinity of Dubuque, Iowa, on our way down to Hamilton/Butler County Regional (HAO), just north of Cincinnati, Ohio. Earlier that morning, we had filed from Tacoma, Washington (TIW) direct to HAO, a plan that seemed the easiest at the time, but it was about to become, quite obviously, not the best idea. Because onboard GPS navigation and ATC computer systems make 'direct to the airport' routing very easy, you readily get into the habit of filing direct. And it generally works out, until …it suddenly does not.

Before departing, we learned there was a cold front just to the west of HAO, extending from northern Ohio down to southern Kentucky. However, it was moving rapidly to the east, leaving us to expect a cold and blustery, but clear VFR, arrival. Our thinking was we would make (traffic and winds permitting) a straight-in visual approach to runway 11 at HAO, from a very long final that started at FL 430, engines at idle all the way down. But, as we our started our descent, it was obvious the frontal system's eastward movement had slowed. We could see the front's towering clouds in front of us, and mid-Ohio airports were reporting a mixture of rain, snow, and low-IFR ceilings and visibility, plus ice and snow on the runways.

HAO is a non-controlled airport, but it does have an ASOS, so from 100 miles out we dial up that frequency, only to find it silent. We then call Minneapolis Center and ask them if they know the weather or approach in use at HAO. They reply "unable on Butler information… approach might have it…two controllers away." They clear us down to FL200, direct to HAO. A couple of frequencies later, we are down to 13,000 and talking to Cincinnati Approach, who is expecting us to proceed direct to the airport, as cleared by Center. We are in clouds and turbulence, still unable to get the ASOS, and strongly suspecting conditions at HAO are not at all VFR. We ask the approach controller if he can obtain the Butler weather for us. He replies 'negative', and promptly asks our intentions.

This is where filing 'direct to the airport' in a busy area gets you in trouble. Our "intentions" were to make a straight-in visual approach from the west, but that plan is clearly no longer viable. The truth is, we are now in solid IMC doing 250 knots, 10 minutes from the airport and neither we nor our new controller know what we are going to do or, given the absent ASOS, what we "should" do.

We tell the approach controller our intentions are to make an instrument approach into HAO, but we first need to know the runway in use. He is busy as all get out, and sounds a bit ticked off that we got dumped on him without this already being worked out, or at least being assigned one of the published standard arrival routes (STARS).

Not knowing what approach to vector us to, he temporizes by giving us a long, multi-waypoint clearance, with many altitude changes, the end point being the Cincinnati VOR (CVG) at 8,000 feet. We quickly scribble it down, enter it into the Universal FMS, and go about doing exactly as we were told, but with a nagging sense of discomfort about what we are going to do when reaching CVG. We then get the brilliantly-simple idea

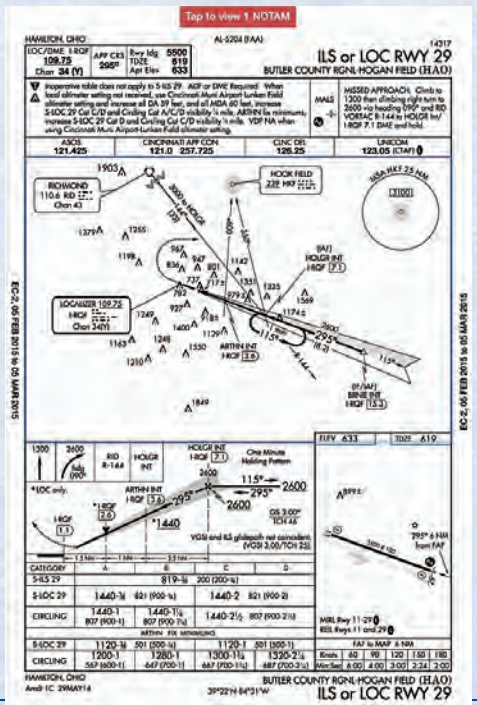
Easy Way

of just calling the Butler FBO on Unicom and requesting an airport advisory…we mutter to each other disgustedly, "now why didn't we think of that before."

Our calls to the FBO go unanswered, but after our third try a Cessna 172 comes back, stating he is making a touch-and-go on runway 29, and the weather is "about" 1000-foot overcast with three miles visibility. Since he used the Alaska-pilot's code word "about" for the weather, we suspect it's much worse than that. How often do the actual conditions just happen to match the exact FAR requirements for VFR? But, at least we know what runway the local traffic is using, and that the weather is probably not below IFR minimums, so we set up the FMS and avionics for the ILS 29 approach.

We return to approach, but cannot get in a word edgewise about our belatedly-arrived-at plan to fly the ILS 29. We are at 8,000 feet, have all the de-ice equipment working in a mixture of rain and heavy wet snow, heading into the back side of a nasty cold front and are rapidly closing in on our clearance limit at CVG. To make things worse, we can see on the multiple moving maps that BRNIE, the IF/IAF for the ILS 29, is disappearing to the left and behind us. It is not a good feeling to be blasting along at 200 knots, heading away from where you want to go, into deteriorating weather, not exactly sure what you are supposed to do next, and unable to talk to the controller.

Fortunately, just as we pass over CVG there is a two-second break on the frequency, and we jump in with "N44LG request direct BRNIE, then ILS 29 Butler". The immediate reply is a clearance to do just that, plus "descend to 3,100 feet…cancel IFR on the ground… change to advisory…now." All delivered so fast you could almost get the impression he was glad to get rid of us. Four minutes later, we are established on the ILS, inside of BRNIE. Another two minutes go by and, less than a mile out, at 700 feet AGL, we finally see the runway…not a clue as to how that C172 found it to be 1000 and three. We land in blowing snow and

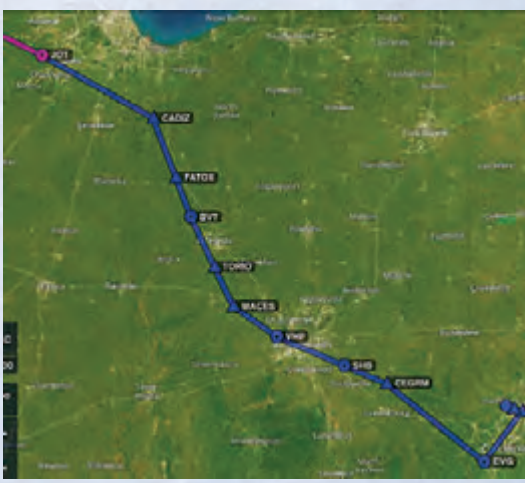


taxi across an icy ramp to park next to a snow-bank in front of the FBO.

At an Italian restaurant that evening, we review the rather-hectic final twenty minutes of our

otherwise routine three-hour flight from TIW. We are experienced, mature, professional pilots, after all, and should not be having such disquieting, adrenalin-arousing airborne experiences. In the end, we decide we got a bit complacent. We filed direct to the airport (HAO), figuring the weather would be VFR; if not, we would do our arrival planning after we received the ASOS. If that didn't work, the controllers would just figure it out for us. As it turned out, the weather was bad, the ASOS was inoperative, and the controllers all down the line kept deferring the arrival plan to the poor final-approach guy, who, with the unexpectedly bad conditions, was almost overwhelmed.

Most of our last-minute urgency would have been avoided if, instead of filing 'direct to the airport', we



had filed 'direct' to the closest entry point on one of the STARS designed for arrivals from the west, with subsequent waypoints leading to the best approach the airport had (in this case the ILS 29). Alternatively, we could have simply requested that routing change with Center somewhere over Montana, when we first realized the destination weather was perhaps not going to be as forecast. The other matter we should have considered earlier is the approach we would have automatically chosen if unable to obtain winds at HAO. The answer is pretty simple; if the airport has only one ILS, in the absence of other information, you rarely go wrong by planning for that approach. Those ILS installations cost the FAA a lot of money, and are almost always designed for the longest runway, with the most-favorable prevailing winds.

As it happens, the Shelbyville Three Arrival (SHB3), with the Joliet VOR (JOT) as the initial entry point, would have worked nicely for our inbound course from TIW to HAO. Although this arrival was not designed specifically for HAO, and would slightly interfere with the Lear's maximal operational efficiency, it is published as an HAO arrival and does have a charted route from CEGRM intersection, just before CVG, which goes to Richmond VOR (RID). RID, in turn, is an entry point for a short leg to HOLGR, the IAF for the only ILS 29 at HAO. If we had filed "TIW direct JOT, SHB3 CEGRM, direct RID, direct HOLGR" (then, in comments, "plan ILS 29"), instead of direct to the airport itself, we and the controllers would have known what we were intending to do if the conditions weren't as forecast, well before our airplane got there.

If you always file with specific routing requests like this (as you probably should), you will find that the controllers will quite often change your carefully-considered plan. After a while, the tendency is to say, "ah, heck with it, I'll just file direct to the airport and let them figure it out… they're going to change it anyway." But, this should be avoided. You can always request "direct to the airport" when conditions look favorable. But, when conditions are unexpectedly bad and the frequency is jammed, the overworked controllers are often happy to have you fly the route you planned with professional foresight, along published arrival corridors to the best approach available at your destination.

Then, when you hear everyone else on the frequency struggling with urgent last-minute requests, you can yawn, push your headset mike aside, and sip the last of the stale, tepid coffee as the FMS and autopilot allow you to drift peacefully through a maelstrom of airborne activity, on a route you programmed while the coffee was still hot and fresh.

Doing it the "easy" way does not always turn out to be the "easiest." CJ

Kevin Ware is an ATP who also holds CFI, MEII and helicopter ratings, and is typed in several business jets. He has been flying for a living on and off since he was 20, and currently works as a contract pilot for several corporations in the Seattle area. When not working as a pilot, he is employed part-time as an emergency and urgent care physician for a large clinic in the Seattle area.

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Citation Sovereign


Global Express

Ready To Make Your Move

by **Tim White**

As a company that specializes in helping owner-pilots transition from piston to turbine power, we are often asked the shortest path to reach their next move-up aircraft. Transitioning to your first turboprop or light jet is somewhat different than moving from a Cessna 172 to a retractable single or light twin. There are multiple facets – from training and insurance to real-world experience and safety – that must be discerned before burning that first drop of Jet A.

Our first piece of advice is to assemble your transition team. This can be a loose assemblage of experienced, trusted advisors, people who will guide you through the process. Your transition partners ought to be selected the way you pick your heart surgeon: Not only should they possess experience, skill and breadth of knowledge, they must have your best interests and well-being at the top of their priority list. If you sense they are focused on what's in it for them, they aren't the right people to have on your team.

Essential to that team is your aircraft ownership advisor – someone who knows the aircraft market, knows your mission and operational needs, and understands where you are in your aviation journey. Their technical knowledge on the aircraft models along your transition path will ensure that you make educated and cost-effective purchase decisions. Also key is a trusted insurance broker who will advise you of what underwriters are looking for and who will go to bat for you when the time comes to write your policy. In addition, include your trusted training professional, someone who has spent significant time with you in the cockpit and knows your skillset and learning style, as well as what you can expect during the transition process.

Finally, your team should include your aviation mentors. These are trusted friends or colleagues who have successfully completed the transition you are contemplating. They also can be professional pilots who are willing to share their experience and knowledge. In addition, your mentors' philosophy and professional approach to flying and operational safety set the bar for how you wish to fly.

If you are a newly-minted multi-engine pilot with the goal to be in the left seat of a light jet, get your team assembled and begin putting together your transition plan.

Meet Mr. Perfect, the Ideal Move-up Candidate

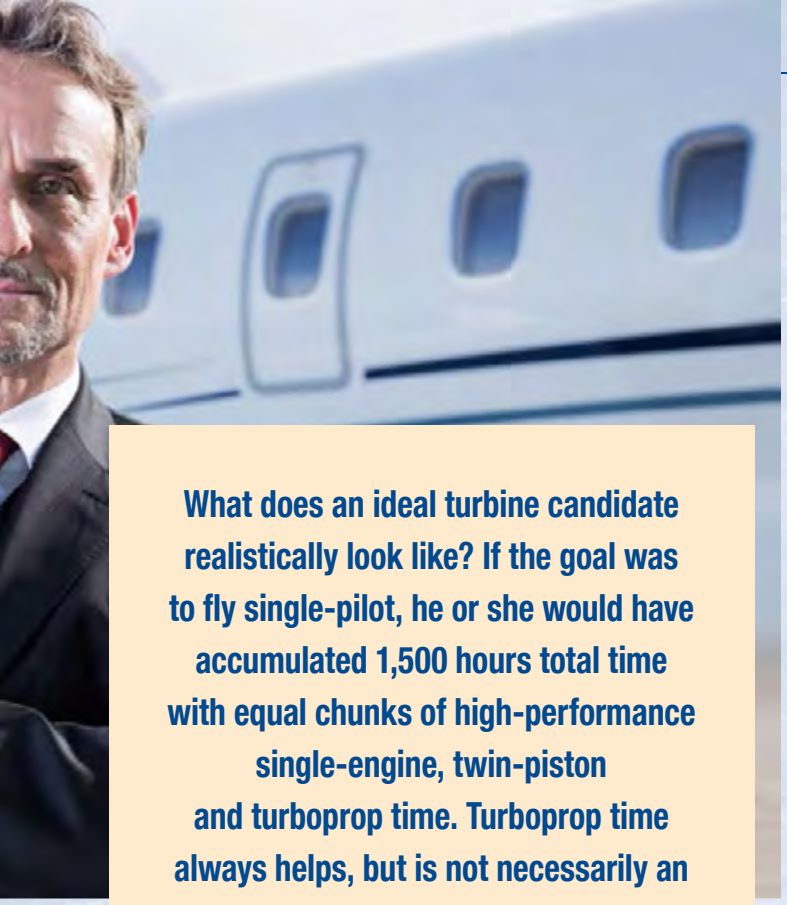
Let's talk about the ideal move-up candidate. In fact, let's strive for absolute perfection. Let me paint the picture for you of what this person is like, in case you haven't met him. First of all, this man or woman isn't simply financially successful; our future turbine pilot is very, very rich. This person doesn't have to be bothered with the day-to-day drudgery of running a company, keeping a schedule, and balancing professional, personal and flying lives. With all this spare time and little or no distractions, he or she can spend as much time as needed to work on ratings and build time. Devoting two-and-a-half weeks to complete an initial type rating is no big deal for our pilot.

Our ideal pilot believes that his logbook isn't complete without tailwheel time, a mountain-flying course, seaplane rating, upset training in an L-39, and an ATP rating. To round out his training, he attends formal recurrency training every six months, followed by a few hours flying with a mentor pilot who happens to be a former Blue Angels pilot.

Our hero keeps his pristine, state-of-the-art equipped airplane at a towered airport with a 10,000-foot runway and stores it in a climate-controlled private hangar. He has his own NOAA weather station and a private staff of meteorologists so he can stay apprised of changing weather conditions.

Our pilot is a health freak, eats only organic foods, is an elite triathlete and gets regular checkups where the doctor marvels at his low blood pressure and cholesterol. To keep himself mentally balanced, he meditates regularly and practices yoga every morning after a solid eight hours of blissful sleep.

Sound like anyone you know? Probably not. However, that doesn't mean all hope is lost. While insurance underwriters and training providers would like you to be as close to that mythical "perfect" status as possible, no one would ever start a transition program if they waited to have all the right boxes were checked.



What does an ideal turbine candidate realistically look like? If the goal was to fly single-pilot, he or she would have accumulated 1,500 hours total time with equal chunks of high-performance single-engine, twin-piston and turboprop time. Turboprop time always helps, but is not necessarily an end-all-be-all prerequisite.

What does an ideal turbine candidate realistically look like? If the goal is to fly single-pilot, he or she would have accumulated 1,500 hours total time with equal chunks of high-performance single-engine, twin-piston and turboprop time. Turboprop time always helps, but is not necessarily an end-all-be-all prerequisite. The candidate would have several hundred hours flying behind glass cockpit technology and attended a formal training program to complete the most recent transition.

Your Transition Plan

We recommend writing out your transition plan, with specific goals and a timeline. If you find yourself short in some areas, work out a strategy to bulk up your experience and hours. Be sure to review it with your transition team and incorporate their recommendations.

Develop a habit and mindset of professional aircraft operation. That means striving to perform every flying task – from pre-flight brief to shutdown – with the utmost professional attention and skill. Be detailed, diligent and take no short-cuts. Develop your own set of standard operating procedures and personal minimums that set out how you will operate your aircraft and under what conditions you won't. If you double as a busy business owner or company executive, this is especially important. Write them down and live by them.

As part of your personal SOPs, get in the habit of doing a risk assessment before every flight. At Kansas Aircraft, our director of flight operations has developed a customized risk assessment form and we require our pilots, regardless of experience, to complete it. This form takes into account weather, aircraft type and equipment, recent IFR experience, time of day, and a health/fatigue self-assessment. It takes but a few minutes to fill it out, but the impartial evaluation it provides is powerful. As PIC, you ultimately make the call to fly or not fly, but the assessment can help you objectively determine whether the cards are stacked against you. *(If you are interested in seeing our customized risk assessment, give us a call!)*

Many times, we are asked why a pilot must methodically go through steps A, B, C and D to reach their goal. Being gifted – both with piloting prowess and a fat wallet – they wonder why they can't be the ones who move from a fixed-gear single right into a jet. Certainly, it's been done. Do we recommend it? Not necessarily. Similar to "What would your mother say?" we'd ask, "What would your transition team say?" Throughout, sit down with each member of your transition team and review your progress, ask what you could be doing differently, and take his or her advice to heart.

Recently, we had a customer develop a strong case of jet fever. He had been casually perusing the light jet listings and discovered what he thought was his dream aircraft.

This customer is fairly new to aviation, having attained his private ticket in the last two years. Before the ink was dry on his instrument ticket, he bought a new glass-panel light piston aircraft and began racking up hours with zeal.

As part of our counseling, we worked with this customer develop a transition plan to help him prepare for his eventual move to a light jet. Then he got the siren song from this late model Citation Mustang. We worked through what a move to this aircraft would require, in terms of training, experience, insurance and pilot mentoring, in order to fly the new jet single-pilot. Then we compared it to his transition plan. Guess what? The original plan made more sense than ever.

At the end of the day, our customer made the decision to move into a single-engine turboprop to gain turbine and high-altitude operating experience. It also will allow him to continue to amass more experience operating in the IFR system. Not only was this the smart move and resulted in more reasonable insurance premiums and training requirements, it fits perfectly with his transition plan that will lead him to flying a light jet in 18 months. He recently said he's relieved that he followed the plan, as he's found the single-engine turboprop is the right fit at this moment in his flying career.

As opposed to pursuing the shortest distance between two points or the lowest cost, put your focus on the smartest strategy. Listen, plan, and ask a lot of questions of whomever you assemble as your transition team. Dedicating the required time and resources to the endeavor will not only ensure that you reach your goals efficiently, it will add deep satisfaction that you are operating at the highest levels of safety, proficiency and professionalism.

Plan the work, and work the plan. CJ

Tim White is CEO and owner of Kansas Aircraft Corporation, an aircraft sales organization headquartered in the Kansas City area. Kansas Aircraft offers a menu of owner-pilot services, including aircraft acquisition, factory purchase, acceptance and delivery, and mentor pilot training and services. A 25-year business aviation veteran, Tim enjoyed a successful sales leadership career at Cessna Aircraft Company where he served as Senior Vice President, Sales for the Americas. In 2012, Tim joined Bombardier Aerospace in a sales leadership role for the Global, Challenger and Learjet product lines, providing him experience in the heavy jet market sector. He is an active multi-engine/ instrument pilot and holds a Citation CJ2 type rating. Contact Tim at (913) 782-8212 or tim@kansasaircraft.com

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Which Airplane

By **David Miller**

Recently, several friends asked me this very question. Both were about to celebrate significant financial events. Both could afford their next airplane and wanted it to be a jet. One is currently a single engine turboprop owner, the other owns a light jet. Both had lots of questions about moving up to a larger jet. They asked for my opinion.

Here are a few things we talked about.

Price

For some, this is the ultimate deal point. Not so much for these two guys. Should you buy new for the increased tax benefits? How much "bang for the buck " do you get with each of the airplanes you are looking at? Is there a current "deal" from the factory on one or the other?

New Or Used

In the past few years, new aircraft models have featured major advancements in avionics, in-flight entertainment, and internet and text communications options. From that perspective, older airplanes have never been older. Newer is easier to finance and more lenders are interested. Your latest airplane may not be your last airplane. When it comes time to sell, older airframes generally command less buyer interest and take considerably longer to sell. If you really plan to keep your bird for a long time, review the market status of various models to see what the trends are.

Mission

Where do you travel now and where do you want to go? If you are moving up to a bigger cabin you will have more friends. Where do they want to go? Do you have grandkids on the way? Will you have new range or speed capabilities that will change your current mission? Are you looking at an airplane that will "almost" make your average trips? Should you be looking at something with longer range capabilities?

Performance

Very few aircraft can legally operate with all the seats and fuel tanks full. Which one is most important? If you have a home in the mountains, what is the hot/high performance of each model? You might be surprised at the answers. Is the aircraft on your wish list capable of landing and departing at your most often-used airports? In all conditions? Not all manufacturers use identical NBAA criteria when reporting performance. For instance, some use long-range cruise speeds to quote max range numbers while others use max-cruise speeds. Make sure your comparisons are "apples to apples." The best "real world" performance experience may come from owners of the models you are looking at.

Avionics

This is perhaps the most important criterion for choosing a specific aircraft. Availability of NextGen avionics, including ADS-B and European requirements, should be a critically important factor in your decision. Upgrading older avionics may be hugely expensive and perhaps even impossible. Get written quotes for any potential upgrades before you buy a "legacy" airplane.

Fit And Finish

Often, when we take a demo ride in a new airplane, we are like a "kid in a candy store", just excited to be there. We are absorbed in the moment and not very introspective. Take another pilot along to make notes of your comments and photograph all the things you forgot to look at. Pay special attention to what the paint and interior of the demo airplane look like. This is what your plane will look like after a year of operation.

Baggage Space

In the Falcon 10 I once owned, we had to schlep most bags through the cabin and stuff them into a tiny bin over the aft couch. Not pleasant. Take a real trip in your short list of airplanes, with real people and real baggage, to see exactly how it handles your passengers.

Service After The Sale

How far are you from the nearest Authorized Service Center? Do you have access to a Mobile Service Unit (MSU)? If so, what is the cost? Are warranty programs equivalent between the aircraft on your "wish list"? How about parts availability? If you are buying used, are your engines on a parts or labor program? Some buyers choose to self-insure engine maintenance and overhaul costs. Be prepared for your airplane to take longer to sell without an engine program or to be substantially discounted at sale time.

Safety Record

Single-pilot certified jets have a remarkable safety record, but each model has its own quirks or unique characteristics. If it's newly certified, what are the first owners

Should I Buy?

saying? What are the knowledgeable aviation writers saying in their pilot reports?

Insurance And Training

Get quotes before you buy the airplane. How much, if any, mentoring will be required? It could be 50 hours or more. Regardless, use an experienced mentor, even if not required. If it's your first jet, is the model you are looking at too big a leap?

One Pilot Or Two?

Two thirds of my jet time has been logged in jets requiring a crew. And while it is really cool to be the only pilot in command, having a second qualified pilot to handle some of the load can be desirable. A jet full of 8 passengers can become a handful if all of them want to ask you a question as you approach minimums. Some older jets require two pilots and are sometimes overlooked due to perceived additional operating costs. More on this in a later article.

Owner Ego

What image are you trying to convey with your new bird? If it's "I have arrived," a big cabin door and high ramp stance may be important. If you are more humble, the fact that it IS a jet may be just fine. By all means, get your spouse or significant other involved in the comparison and demo process. They will see things you don't.

Social Aspects

Owner pilot groups have "taken off" in the last five years. They offer regional and national meetings in exciting locales where pilot education is combined with great entertainment for both the pilot and spouse. Virtually all of them have their own dedicated websites, full of great operational information about your favorite jet.

Does It Have To Be A Jet?

There is no getting around the fact that a jet is just plain awesome to own and fly. But, do you really need it? If you have stage lengths of 300 miles or less, probably not. If most of your flying is done in the Northeast where it is difficult to obtain higher fuel-efficient altitudes, maybe not. And, after a thorough analysis of all the variables and emotions, you may decide to stay with the ride you have. Regardless, the process of looking is really fun. Fly Safe. CJ

By **Kevin R. Dingman**

Too Low – Goat

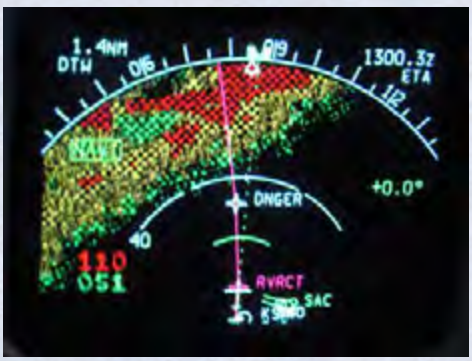
One of several hilarious, flying-related Far Side cartoons is the classic goat-in-the-clouds. We all hope to never see such a thing in the clouds, or any other solid object for that matter. Most often encountered during arrival and approach, CFIT–Controlled Flight Into Terrain, is a serious subject. Pilots can avoid CFIT and goats by installing a TAWS (Terrain Avoidance and Warning System), commonly known by Honeywell's trademark name: EGPWS – Expanded Ground Proximity Warning System. GPWS and EGPWS are essentially the same system except that EGPWS includes a terrain database that adds a "predictive" function to the traditional GPWS.

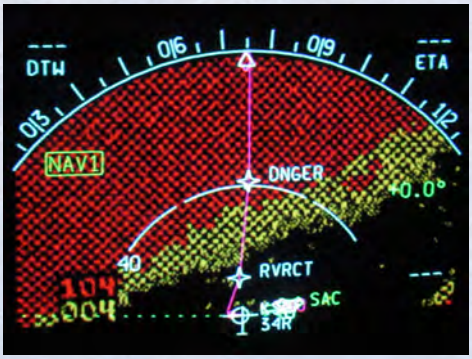
Studies conducted after a rash of CFIT accidents in the late 60's concluded that some type of automatic warning system, alerting pilots to the proximity of the ground, could have prevented the accidents. As a result of the studies and recommendations by the NTSB, in 1974 the FAA and, in 1979, ICAO, required all large turbine-powered aircraft to install GPWS. In 2002, the rule was amended to include all jets and all aircraft with a MTOW greater than 12,500 lbs. There is a further distinction in the type of TAWS required (Class A or B, and with or without a visual display), based on the number of passenger seats configured and whether the airplane is used in commercial air transport or general aviation. For TAWS neophytes, and those like me that have trouble remembering the rules for who needs a TAWS, or the eleven or so alerts and warnings presented by TAWS, I offer this brief dissertation on terrain avoidance and warning systems.

Who Needs 'em

There are three categories of TAWS: Class-A, B and C. Class-C is simply a Class-B custom-modified for use in smaller GA airplanes that have no mandated requirement to have a TAWS. Class-A is at the top of the food chain in cost and capability, Class-C is at the bottom. The Class-A TAWS must have both an aural and visual output to the crew. Class-B has the option of having a display or not having a display – Class-C has no display. The "who needs 'em " question is answered by the FAR "Part" under which you operate, the type of motor propelling your vehicle, your MTOW and the number of "configured" passenger seats in your plane. Here's a summary:

Part 91.223 – Piston powered – no TAWS mandated. Turbine powered with less than six passenger seats and less than 12,500 lbs., no TAWS mandated. Turbine powered with six or more passenger seats, regardless of MTOW, Class-B TAWS, no display mandated.





Part 135.154 – Piston powered over 12,500 and ten or more passenger seats, Class-B with no display mandated. Turbine powered with six to nine passenger seats, Class-B with no display mandated, Turbine powered with ten or more passenger seats, Class-A with display required.

Part 121 – Class-A with display mandated for all operators.

For a Class-A TAWS, you need additional equipment to provide input to the system: Gear and flap position, radar/radio altitude, CADC, GPS, glideslope and SAT (static air temperature), for example.

CFIT happens most often when flying non-precision approaches. Continuous Descent Final Approach (CDFA) is one of the initiatives to address the problem in this phase of flight. In industry parlance, the previous method of flying a non-precision approach such as VOR, NDB, LOC-BC or GPS/RNAV approach was called "Dive-and-Drive." The phrase describes the technique of diving from the FAF to the MDA, and then, once level, driving to the MAP. This means we're cruising at a very low altitude, relatively slow and often several miles from the runway. We would then calculate a VDP, Visual Descent Point, from which to descend to the runway. This type of approach descent differs greatly in stability, consistency, predictability and pilot workload from a constant rate-of-descent approach, such as on an ILS glideslope. Most non-precision approaches now incorporate some form of a CDFA. Combining a TAWS with a CDFA goes a long way in

helping us avoid CFIT on arrival. And a Class-A TAWS will help to ensure proper landing configuration as well.

Climb, Climb Now!

We should all be practicing a handful of the alert and warning modes from our TAWS each time we go to the sim for recurrent training. At my carrier, windshear and terrain alerts are two of the many "first-look" maneuvers included in a long list of mandatory events that we perform every time in the sim. First-look means we are not forewarned about when, where or how often the alerts will occur – just like real life. The requirement is both a test and a strengthening of the mental memory-muscles to ensure instinctive compliance with the warnings. While I've never experienced an actual terrain warning, I did experience my first TCAS RA (resolution advisory– a traffic warning in which you must react) recently. We were in IMC and the TCAS display was being shared with the weather radar. The display scale was at 40 nm due to convective activity, making the TCAS target appear at the very bottom, where the radar display comes to a point. At DFW, all departures have a top altitude of 10k and all arrivals have a bottom altitude of 11k – a 1,000-foot difference. If the departing and arriving aircraft are climbing and descending at 1,300 fpm or so and are converging, the TCAS of one or both aircraft will compute an incursion into the safety bubble. This was the case during our arrival and the TCAS instructed an immediate climb of over 2,000 fpm instead of our existing 1,200 fpm descent: Autopilot off, auto-throttles off, initiate rapid but smooth compliance. Shortly after beginning the maneuver, a break in the clouds allowed us to spot the other aircraft– and, as you would hope, it wasn't even close and it wasn't a goat.

Immediately and Instinctively

As was discussed in the April *T&T* article "Where Are We Now, Exactly?", even if the TAWS operates as it should, action initiated by the crew is what makes the airplane avoid the rocks, not the avionics. After all, we are the ones flying the plane, the ones who are supposed to know exactly where we are at all times, and the first ones at the scene of the impact if we fail to do so. In the past, I've discussed the phenomenon of time compression during an intense event: how our memory works and, more relevant to this article, how we experience a mental delay when we're surprised or shocked by an event. Unlike piston-engine failure training, in which we verify, identify and feather, or the well-known axiom to "Wind The Clock" to slow us down, so as to not make a bad situation worse through our haste, it's critical that we are trained and conditioned to react immediately, and instinctively, to both TCAS and TAWS warnings.

The escape maneuver or procedure for your plane likely includes disengaging some, or all, of the automation, then hand-flying a prescribed maneuver. Once into the maneuver, it probably has you check your configuration for such things as spoilers and power settings, and then to monitor aircraft performance to ensure terrain separation or a return to normal performance during a windshear event. Don't think about it, don't question it, don't analyze a false warning, don't look around to figure out what it sees – and don't delay. Like the Nike slogan says: "Just Do It." Be smooth, but be quick. You can get on the radio after you have a successful recovery in progress; tell ATC or other aircraft what you are doing. Don't worry, following a TCAS RA or a TAWS warning gives you a get-out-of-jail-free card to violate any clearance or regulation.

Pilots Who Stare at Goats

Based on Jon Ronson's non-fiction bestseller of the same name, the movie "Men Who Stare at Goats" is based on the U.S. Army's foray into psychic research for use as a weapon. During an allegedly true incident, a psychic operative stared a goat to death. Staring at a TAWS warning is like staring at the goat in a cloudbank, believing that it must be wrong. Even if you think you're a psychic, the goat won't fall over and the rocks won't move out of your way. This is one of the few times in aviation that you are encouraged to act quickly and instinctively. When the TAWS gives you a warning, don't stare at the goat. Escape. CJ

Gulf Coast Avionics Receives Approval of Extensive Garmin Touchscreen Avionics Upgrade for Citation 501

Rick Garcia, President and CEO of Gulf Coast Avionics Corporation, announced on March 5, 2015 that the company recently received an FAA field approval for an extensive digital panel upgrade on a legacy Cessna Citation 501 business jet.

"The customer wanted to upgrade the capabilities of his Citation 501 and the only way to do it cost-effectively was to work with the Orlando FSDO to earn the field approval," Garcia stated. "I really have to complement our Chief Inspector, Sarah Smith, and the entire engineering and installation group. This was not an easy task, but the result is a beautiful and very capable Citation."

Ms. Smith stated, "As you can imagine, there was a lot of paperwork and documentation that went along with the physical installation process. As far as we know, this was the first field approval for this package in the 501. We are very grateful to the Orlando FSDO representatives for all of their cooperation and guidance as we worked through the process."

Smith explained that the Citation 501 panel upgrade included:

- Dual Garmin GTN 750 Touchscreen GPS/NAV/COMM/MFDs
- Dual Garmin GTX 33 transponders
- Garmin GMA 35 remote audio processor
- Garmin GDL 69 XM WX satellite receiver
- Garmin GPSS roll steering integration with the GTN 750 and legacy autopilot
- Garmin TAWS-B interface
- Bendix/King RDR-2000 weather radar interface
- Jeppesen electronic charts capability

"Our engineering team also designed new metal instrument panels that were laid out to the owner's specifications," Smith said. "Interfacing the new avionics with the legacy radar, TCAS and autopilot was pretty straight-forward for our team."

"The customer was absolutely thrilled when he saw it for the first time," Garcia said. "While the finished panel is fantastic, it was the result of a lot of really hard work and dedication by our professional team. I can tell you that at every level this is not a project that many shops would want to take on."

For more information, visit: *www.GCA.aero* CJ

Kestrel and Eclipse Become ONE Aviation

In an announcement released April 15, the executives of Kestrel Aircraft and Eclipse Jet announced the companies are merging to form ONE Aviation.

"We are excited to announce the formation of ONE Aviation. I feel privileged to lead this experienced team of aviation professionals as we increase production of the Eclipse Jet, further the development of the Kestrel turboprop, and build a suite of general aviation products second to none in the industry," stated Alan Klapmeier, CEO of ONE Aviation.

ONE Aviation will focus on providing high-performance aircraft owners an uncompromising aviation experience – from producing innovative aircraft to delivering industry-leading training and customer support services. ONE Aviation will immediately gain operational and marketing efficiencies by consolidating and leveraging the Eclipse and Kestrel business operations, supply chains, and marketing and sales teams, all under a single and seasoned management team.

Klapmeier further stated, "I am particularly excited about the Eclipse 550. As our pilot experience and aircraft needs grow, we look to move up – to fly higher, faster and safer. For many pilots and aircraft owners, the Eclipse Jet, with its incredible efficiency and safety record, provides that next step."

Mason Holland, Chairman of ONE Aviation, said, "Combining the synergies of Eclipse and Kestrel under the leadership of Alan Klapmeier is a perfect fit. I believe that our current, as well as our future, customers will appreciate Alan's vision and his prior experience in leading the design, development and production of one of the world's most successful aircraft programs. Alan knows our customers, he is a champion for them, and he is recognized throughout the aviation industry as an innovator and transformational leader."

The Eclipse Jet is currently in production and is the world's only twin-engine light jet priced below $3 million. The Kestrel K350, currently under development, will redefine the industry's single-engine turboprop market.

Information: *oneaviation.aero* CJ

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Citation Jet Pilots To Meet In Colorado Springs, September 9-13

The annual convention of Cessna Citation owners will return to The Broadmoor resort in Colorado Springs, Colorado, from September 9 to September 13, 2015. Following on the heels of a highly-successful 2014 meeting in White Sulphur Springs, West Virginia, the 2015 CJP convention will feature informative seminars and workshops, as well as a trade show targeted to CJP members.

CJP attendees will be flying into Colorado Springs Municipal airport (KCOS) and will be hosted by Colorado Jetcenter. The historic Broadmoor Resort opened in 1918 and is a five-star facility, voted #1 of 105 hotels in Colorado. CJP convention events will include speakers and presentations, golfing, fine dining, and scenic tours, along with Companion activities, plus meeting and reconnecting with fellow CJP acquaintances.

For membership and convention information, visit *www.citationjetpilots.com* CJ

Ad Index

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JETS

CHIEF PILOTS & OWNERS

Aircraft Count

4	AIRBUS ACJ319
32	ASTRA 1125
31	ASTRA 1125SP
63	ASTRA 1125SPX
51	BEECHJET 400
275	BEECHJET 400A
58	BOEING BBJ
391	CHALLENGER 300
65	CHALLENGER 600
58	CHALLENGER 601-1A
133	CHALLENGER 601-3A
56	CHALLENGER 601-3R
279	CHALLENGER 604
5	CHALLENGER 800
169	CITATION 500
319	CITATION 525
284	CITATION BRAVO
151	CITATION CJ1
69	CITATION CJ1+
202	CITATION CJ2
160	CITATION CJ2+
390	CITATION CJ3
180	CITATION ENCORE
306	CITATION EXCEL
5	CITATION I
288	CITATION I/SP
478	CITATION II
50	CITATION II/SP
173	CITATION III
329	CITATION MUSTANG
138	CITATION S/II
257	CITATION SOVEREIGN
284	CITATION ULTRA
287	CITATION V
20	CITATION VI
104	CITATION VII
257	CITATION X
199	CITATION XLS
1	DIAMOND I
53	DIAMOND IA
3	DORNIER ENVOY 3
282	ECLIPSE EA500
47	EMBRAER LEGACY 600
8	EMBRAER LEGACY 650
158	EMBRAER PHENOM 100
82	EMBRAER PHENOM 300
123	FALCON 10
28	FALCON 100
25	FALCON 200
176	FALCON 2000
21	FALCON 2000EX
81	FALCON 20C
17	FALCON 20C-5
26	FALCON 20D
3	FALCON 20D-5
7	FALCON 20E
8	FALCON 20E-5
59	FALCON 20F
82	FALCON 20F-5
229	FALCON 50
8	FALCON 50-40
113	FALCON 50EX
135	FALCON 900
21	FALCON 900C
116	FALCON 900EX
98	GLOBAL 5000
112	GLOBAL EXPRESS
25	GULFSTREAM G-100
161	GULFSTREAM G-200
8	GULFSTREAM G-300
27	GULFSTREAM G-400
222	GULFSTREAM G-450
7	GULFSTREAM G-500
330	GULFSTREAM G-550
42	GULFSTREAM G-I
110	GULFSTREAM G-II
31	GULFSTREAM G-IIB
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188	GULFSTREAM G-IV
317	GULFSTREAM G-IVSP
182	GULFSTREAM G-V
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9	HAWKER 125-1A
2	HAWKER 125-1AS
1	HAWKER 125-3A/RA
2	HAWKER 125-400A
29	HAWKER 125-400AS
1	HAWKER 125-400B
4	HAWKER 125-600A
11	HAWKER 125-600AS
113	HAWKER 125-700A
50	HAWKER 4000
187	HAWKER 400XP
21	HAWKER 750
223	HAWKER 800A
2	HAWKER 800B
335	HAWKER 800XP
14	HAWKER 800XPI
67	HAWKER 850XP
131	HAWKER 900XP
4	JET COMMANDER 1121
6	JET COMMANDER 1121B
12	JETSTAR 731
11	JETSTAR II
51	JETSTREAM 31
40	JETSTREAM 32
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15	LEARJET 23
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19	LEARJET 24B
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9	LEARJET 24F
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94	LEARJET 25D
6	LEARJET 28
28	LEARJET 31
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426	LEARJET 35A
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34	LEARJET 36A
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13	SABRELINER 40A
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24	SABRELINER 60
1	SABRELINER 60A
2	SABRELINER 60AELXM
12	SABRELINER 60ELXM
3	SABRELINER 60EX
1	SABRELINER 60SCEX
85	SABRELINER 65
1	SABRELINER 75
17	SABRELINER 80
3	SABRELINER 80SC
101	WESTWIND 1
4	WESTWIND 1123
45	WESTWIND 1124
76	WESTWIND 2

TURBO PROPS

CHIEF PILOTS & OWNERS

Aircraft Count

275	CARAVAN 208
1087	CARAVAN 208B
3	CARAVAN II
34	CHEYENNE 400
221	CHEYENNE I
14	CHEYENNE IA
303	CHEYENNE II
59	CHEYENNE III
21	CHEYENNE IIIA
59	CHEYENNE IIXL
22	CHEYENNE IV

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12	KING AIR 200C
12	KING AIR 200T
203	KING AIR 300
3	KING AIR 300LW
588	KING AIR 350
34	KING AIR 350C
17	KING AIR 90
7	KING AIR A/B90
120	KING AIR A100
203	KING AIR A200
58	KING AIR A90
221	KING AIR A90-1
135	KING AIR B100
902	KING AIR B200
78	KING AIR B200C
63	KING AIR B200GT
2	KING AIR B200SE
3	KING AIR B200T
66	KING AIR B90
295	KING AIR C90
32	KING AIR C90-1
160	KING AIR C90A
316	KING AIR C90B
7	KING AIR C90SE
278	KING AIR E90
160	KING AIR F90
17	KING AIR F90-1
1	MERLIN 300
1	MERLIN IIA
29	MERLIN IIB
12	MERLIN III
20	MERLIN IIIA
49	MERLIN IIIB
14	MERLIN IIIC
5	MERLIN IV
13	MERLIN IV-A
13	MERLIN IV-C
105	MITSUBISHI MARQUISE
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29	MITSUBISHI MU-2F
1	MITSUBISHI MU-2G
22	MITSUBISHI MU-2J
32	MITSUBISHI MU-2K
15	MITSUBISHI MU-2L
23	MITSUBISHI MU-2M
30	MITSUBISHI MU-2N
38	MITSUBISHI MU-2P
55	MITSUBISHI SOLITAIRE
673	PILATUS P-12
341	PILATUS PC-12 NG
549	PILATUS PC-12/45
154	PILATUS PC-12/47
18	PIPER 700P AEROSTAR
492	PIPER MERIDIAN
10	ROCKWELL 680T TURBO
6	ROCKWELL 680V TURBO II
7	ROCKWELL 680W TURBO II
9	ROCKWELL 681 HAWK
89	SOCATA TBM-700A
91	SOCATA TBM-700B
4	SOCATA TBM-700C1
115	SOCATA TBM-700C2
318	SOCATA TBM-850
22	SOCATA TBM-900
6	STARSHIP 2000A
51	TURBO COMMANDER 1000
27	TURBO COMMANDER 690
129	TURBO COMMANDER 690A
113	TURBO COMMANDER 690B
58	TURBO COMMANDER 840
16	TURBO COMMANDER 900
23	TURBO COMMANDER 980

TWIN PISTON

OWNERS

Aircraft Count

9	ADAM A500
1550	BARON 58
479	BARON 58P
137	BARON 58TC
5	BARON A56TC
142	BARON G58
43	BEECH BARON 56 TC
2	BEECH BARON 58 PA
217	BEECH DUKE B60
193	CESSNA 340
556	CESSNA 340A
120	CESSNA 402B BUSINESS LINER
64	CESSNA 402C
38	CESSNA 404 TITAN
288	CESSNA 414
374	CESSNA 414A CHANCELLOR
72	CESSNA 421
61	CESSNA 421A
454	CESSNA 421B
757	CESSNA 421C
66	CESSNA T303
124	PIPER 601P AEROSTAR
29	PIPER 602P AEROSTAR
465	PIPER CHIEFTAIN
28	PIPER MOJAVE
870	PIPER NAVAJO
24	ROCKWELL 500 SHRIKE
33	ROCKWELL 500A SHRIKE
69	ROCKWELL 500B SHRIKE
46	ROCKWELL 500S SHRIKE
8	ROCKWELL 500U SHRIKE
28	ROCKWELL 520 COMMANDER
15	ROCKWELL 560 COMMANDER
21	ROCKWELL 560A COMMANDER
17	ROCKWELL 560E COMMANDER
11	ROCKWELL 560F COMMANDER
36	ROCKWELL 680 SUPER
17	ROCKWELL 680E
19	ROCKWELL 680F COMMANDER
22	ROCKWELL 680FL GRAND COMMANDER
14	ROCKWELL 680FLP GRAND LINER

HIGH PERFORMANCE MOVE-UP SINGLES

OWNERS

Aircraft Count

250	BEECH BONANZA
493	CESSNA 182
71	CESSNA 206
448	CESSNA P210N
26	CESSNA P210R
58	CESSNA T182
1	CESSNA T206
2714	CIRRUS SR22
240	PIPER MALIBU
387	PIPER MALIBU MIRAGE

37,744 TOTAL AIRCRAFT

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ON FINAL

by **David Miller**

A Little Rusty

With 5,000-plus hours in his logbook, David Miller has been flying for business and pleasure for more than 40 years. Having owned and flown a variety of aircraft types, from turboprops to midsize jets, Miller, along with his wife Patty, now own and fly a Citation CJ1+. You can contact David at davidmiller1@sbcglobal.net.

How often should we fly to maintain our skills? Certainly more often than our regulatory landing or instrument currency requirements. But, how often? For me, I prefer at least once a week, but that is not always possible. After two weeks, my personal corrosion starts to show. And recently, I had to wait 28 days for the next takeoff and landing. Maintenance, grandkids, weather, you name it. I had lots of excuses. So, on this particular morning, I was not entirely comfortable during my long-delayed preflight. To compound matters, I was departing from a new hanger and FBO ramp, as my airplane's address had changed during the downtime.

My walk-around was a little more thorough on this morning. Every door secured? All fluids just right? Then, I checked them a second time. I filed for my frequent short hop to KSHV (Shreveport, LA) in good VFR weather. Did I mention that the airplane just came out of maintenance? Nothing major, but it involved a half-dozen small things that could change my departure routine if they weren't quite right and needed attention after takeoff. I took my time to make sure that the mechanics did not leave a switch or two in different positions than I had them. Sure enough, I found a couple of breakers that needed to be reset.

Departing to the south out of KADS (Addison, TX) can be challenging, including an immediate 100-degree heading change, a power reduction , and a level off at 2,000 feet in a high traffic area. I verbally briefed the departure and call-outs with more emphasis than usual. I made a mental note of any quick return I might have to make if lights, bells, and whistles unexpectedly rang. All the stuff I am supposed to do on any takeoff. But today, I paid a little more attention.

Of course, all went well with no real surprises. But I did notice some corrosion in my skills. For instance:

1. FMS fumble fingering. It's not just like riding a bicycle. Taking a month off from programming the box can cause some moments of confusion.
2. My scan was slow. I took too long to notice that the two PFD's had differing altimeter settings.
3. My reaction time to entering an unexpected arrival in the FMS was too long.

The actual flying part was very much like riding a bicycle. But, feeling comfortable with the automation was not. I also found that I couldn't stay very far ahead of the airplane, since I had to focus on "here and now" activities. I was glad I waited for a CAVU day, with no passengers to attend to. Finally, headed for a visual back home, I relaxed for a minute.

"November 1865 Charlie cleared direct KEFDE on the RNAV 33 approach," came the approach controller's clearance.

What? Why? Where is that? More finger-fumbling ensued. Finally, I got KEFDE entered into the FMS.

Nice landing. Now, I feel like I am ready for anything.

But, did I forget to disconnect the battery?

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