Twin & Turbine

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

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Flying The P-51 Mustang

Take Control Of Your Flight

Winning The Medical Game

TWIN & TURBINE

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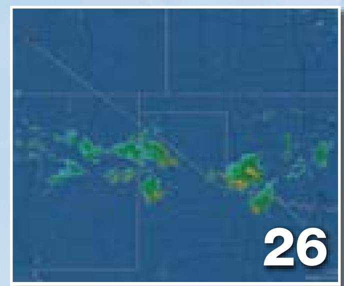

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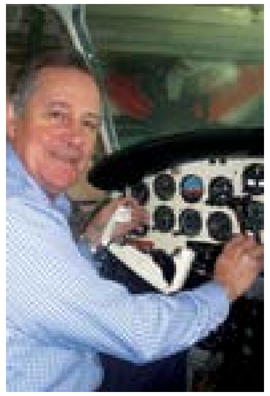
editor's**briefing**

Where's Your Protected Airspace?



As expected, my recurrency training wasn't going smoothly. The instructor was complaining of vertigo, no doubt brought on by my ceaseless bracketing of the course leading toward my clearance limit, where I was expected to enter a hold. Naturally, the depicted hold was oriented away from my entry heading, necessitating a course reversal, and, as part of my briefing, I noted that it was non-standard, requiring left turns around the racetrack.

Okie-dokie; I speared the fix, swung out and around to come back for the first full lap of the holding pattern, and found the fix again, adroitly swinging right, just like I would at home base. "Uh, Leroy," sez Instructor Jim, "where's your protected airspace?"

"East of the fix," I responded, "where I did my course reversal. Now I'm heading back outbound in the hold." "So why'd you turn right, to the west?" intoned the Voice of Doom. Before he could say "Drop and give me twenty" I muttered "No excuse, Sir!" and cranked hard left, toward the fix and safe airspace.

Many times, we get so involved in our course-holding and checklisting that we ignore positional awareness. That happens in life, as well as in aviation. Habitual procedures can overlay and render obscure important minutia like a "No procedure turn" note or that the DME distance shown is from an offsite facility. Or perhaps we forgot to check in with the folks at home before the last re-scheduled launch, to let them know we'd be late for dinner, again. Protected airspace comes in many forms, not all of it around the airplane.

One of the things I like about aviation is that fosters a good, clean-living, dead-honest attitude, applicable to many of our other endeavors. Protected airspace is a concept we must always bear in mind, to know where we can turn for a safe haven, a place free of intruding rocks and steel. And when we're on the ground, we also need to maintain our posterior protection. In the case of non-aviation activities, our fail-safe planning keeps us from overdrawing a bank account, parking in a tow-away zone or pursuing a conversation with a closed-minded individual. Know when to back away to "protected airspace", and know instinctively where it can be found.

I couldn't blame my training instructor for setting me up for this turn toward the Dark Side; the true path to protected airspace was clearly shown, I had espoused my intentions more than once, and yet I let the routine press of business interfere with my thinking at a critical juncture. Fortunately, I got another chance – this time – and learned to keep protected airspace uppermost in my mind.

In This Issue

Ever wonder what it would be like to fly a P-51 Mustang? Our Citation and Stearman owners, Adam Alpert and his wife Gisela, journeyed to Stallion 51's famous Mustang academy in Kissimmee, Florida to experience the World War II fighter and now share their findings with us. Tom Turner gives sage advice about hurriedly feathering in Twin Proficiency, John Loughmiller advises on how to successfully cope with the vision portion of the medical exam, and David Miller shows how expected good weather can turn into a challenge. Everyone can learn from this issue.

LeRoy Cook.
Editor

Checkout for Mustang Lovers

By **Adam Alpert**

Paul Bowen Photo

Flying The Famous Fighter

I give my wife Gisela a lot of credit when it comes to embracing mid-life dalliances. She enthusiastically mastered SCUBA diving and braved heli-skiing, and she gamely crewed our J-105 sloop, even on the stormy days. Still, I didn't anticipate that we would find ourselves training together at Stallion 51's facility in Kissimmee, FL (KISM). Yet, there we were, suited up and ready to go, the iconic World War II vintage P-51 Mustang beckoning.

The P-51 Mustang is a big, powerful airplane. Later variants had MGTOWs of nearly 12,000 lbs, fully loaded with armament, fuel and externals. The Mustang is also high energy, to say the very least. The entry speed for aileron rolls is normally 210 knots and, for loops, a staggering 260. Cruise speed is 323 knots at 25,000 feet and, even with full flaps (50 degrees), 110 knots is the short-final target ref speed, about the same as our CJ3 jet.

The P-51 is also a systems airplane, with hydraulic gear and flaps, and an advanced cooling design that actually adds thrust (the scoop underneath that funnels air to the water and oil radiators also acts like a small ram-jet). If there's an Achilles Heel to this airplane, it's that very close attention must be paid to managing the coolant temperature. It nominally runs between 100-110C, automatically controlled by operating an exhaust door at the rear end of the scoop. Anything outside of that range is a problem. For this reason, the airplane wasn't a particularly-effective low-level fighter; very vulnerable to ground fire, one

lucky hit to a cooling line and it's game over.

Handling Characteristics

Prior to handing the reins over to me, Steve Lamore, instructor and mechanic for the airplane, demonstrated the basic aerobatic maneuvers, including loops, aileron rolls, barrel rolls, split S's, and Immelmans,. All are pretty straightforward, with the exception of the very high and long duration (for me) G forces needed to maintain any reasonable confinement of the maneuver; 2.5-3.7Gs is typical while doing loops, for example. Side note: Stallion 51 doesn't use G-suits for its training.

There is no stall warning system in the airplane, so much of the training involves stall recognition. Both normal and accelerated stalls are preceded by some aerodynamic buffet. The range of airspeeds where these progressive buffets occur narrows from 76-88 knots, clean in level flight, to 72-76 knots with gear and flaps down. When clean and in a steep bank (i.e. 60-70 degrees) the delta between onset and stall decreases even more, and the speed range shifts upward to 120-122 knots. We did a number of maneuvers to explore the buffet phenomena, including flying in tight (70 degree) turns where the goal was to stay in the buffet range without stalling. Pretty tough!

Takeoffs and landings have their own challenges. Day 1 puts the student in the back, where the visibility is terrible (even worse than a Stearman, in my opinion). So, the first few takeoffs can be very interesting. As one might expect, the 1,600 HP Merlin V-12 produces a lot of torque. Torque effect while accelerating for takeoff is a real issue. But there is also gyroscopic precession, in addition to P-factor and slipstream. In little airplanes, the gyroscope effect is relatively minor because the propeller systems are light, in contrast to the 450-lb Hamilton Standard 4-blade propeller used on the P-51. Independent of the other factors, just raising the tail during takeoff causes a pronounced left-turning tendency. Analogous to a helicopter, the effects of any one control input (power, stick, rudder) must be anticipated. Adding power and raising the tail should always be accompanied by application of significant right rudder. And this is with 6 degrees of rudder trim already cranked in.

Taxiing the airplane is accomplished with the tail wheel locked to steer 6 degrees right or left, using the rudder pedals to track an S-pattern, typical of low forward visibility designs. Unlocking the tail wheel is done by moving the stick all the way forward. The airplane can then be pivoted with a combination of braking and power. Even at idle the crackling (backfiring) Merlin provides plenty of power to motor around on the ground. With this in mind, great care must be taken to avoid any asymmetrical braking while the tail wheel is locked. A small amount of braking on one side while taxiing, a mistake I made more than once, can cause the entire locking system to fail.

The P-51 is configured clean for takeoff, with the takeoff itself a sequenced affair that starts with a static check of systems at 2,300 rpm. Once complete, brakes are released and the takeoff begins. The pilot steadily adds power up to 40 inches of MP. The tail is raised at 50 knots and power is further increased to 55 inches. The airplane lifts off the runway at about 100 knots.

Moving Forward

Day 2 is somewhat easier because the student flies from the front where the visibility is better. But the workload is higher, too. Just starting the airplane is a process, with cold and hot starts requiring different procedures. And, given that the starter (and primer) is controlled only from the front, it is 100% up to the student to get it right. On this particular day the airplane was hot, having already been flown in the morning. The procedure is 1) throttle to idle (800 rpm/cracked about ½ inch), 2) boost pump on, 3) slight (½ second) prime, 4) hit the starter button, 5) after four blades or combustion mags to both, and 6) mixture auto-lean. It seems simple enough, but it requires quite a bit of contortion to accomplish everything in the 3-5 seconds of the start sequence. Happily, I got the airplane started on the first attempt.

In the course of the two days, we did a number of touch-and-go landings at Bartow (KBOW), about 27 NM SW of Kissimmee. Interestingly, Bartow was a P-51 Mustang training base during WWII! Landing the airplane is straightforward. The initial flaps of 20 degrees helps slow the aircraft to landing gear extension speed of 150 knots. This puts the aircraft on downwind at approximately 140 knots. The next 10 degrees is coincident with turning base and 130 knots. Turning final, airspeed is reduced to 120 knots with 40 degrees of flaps deployed. On short final, for a normal landing, the last 10 degrees (50 degrees total) are

added and the airplane is slowed to 110 knots with the goal to cross the threshold around 100 knots.

Speed control is not particularly difficult to manage, but it is important not to get too slow, especially when turning. Aggressive recovery with power can cause loss of control, and when low this is always fatal. On several of my approaches I got about 10 knots below target and was quickly reminded to correct the problem.

Descent to flare and landing is mostly about staying lined up with the runway, flaring smoothly while gradually reducing power over the threshold until the airplane touches down two-point. But the pilot does have to precisely fly the needed glide slope. Curiously, slipping the P-51 isn't a particularly effective way to lose height. And reducing power below the minimum 26-inches during the approach is hard on the V-12 engine. Once on the ground, the airplane actually tracks pretty straight, but as the tail comes down the propeller precession tends to drive the airplane right instead of left. And this, amazingly enough, is at idle rpm. Again, anticipation is the key. After three or four landings, my weaving on rollout had somewhat improved.

On one landing, I bounced the airplane. With help from Steve, I recovered, but this experience reminded me that the recovery tools available in the P-51 are somewhat limited, compared to lighter tail-wheel airplanes. Adding power after the bounce, for example, isn't helpful because this causes control problems. And PIO must be avoided at all costs. Stallion 51 teaches a gentle re-leveling and no power changes, with the idea that there is likely still plenty of flying energy to land smoothly. The other solution is to feel for the ground with one wheel after the bounce. Actually, I saved my landing unaided by doing this when we returned to Kissimmee for the last time, and this one had three bounces. "Fix it", Steve said, and so I did.

There are a number of emergency scenarios, the worst being an engine failure or fire. Unless there is an airport immediately below, bailout is probably the best route to survival, providing sufficient altitude is available. For this reason, there is significant emphasis on egress technique, including jettisoning the canopy and diving out the right side (because of slipstream effects). Hydraulic failures are more benign because the gear freefalls to the locked position. If suspecting a hydraulic failure, the technique is to use whatever pressure is left in the accumulator to get the flaps down (or partially down) before attempting the gear. Strangely, landing with no flaps commands the same ref speeds as landing with them. The electrical emergencies are like other airplanes; generator off, boost pump off, for high voltages. For low voltages, verify generator failure, lower load (boost pumps off, etc.). Land as soon as practical, in either case. High coolant temperatures is a special situation; the pilot may have to pull an emergency coolant door handle, forcing the door at the aft end of the cooling scoop to open independent of the electrical controller.

Available Training

Stallion 51 offers several training options, including the check-out curriculum (front-cockpit transition) I selected, for pilots holding significant complex airplane experience and at least 500 hours of tail wheel time. Gisela's training, billed as an orientation flight, focused on flying and maneuvering, leaving takeoffs and landings to her instructor, John Black. John, a former Air Force F-15C combat pilot, demonstrated the aerobatic maneuvers and Gisela replicated them with finesse. The souvenir video proved she did a great job, a testimonial to both Gisela's strengths as a Private Pilot and Stallion 51's long history of providing authentic combat aircraft experiences to pilots and non-pilots alike.

The P-51 is iconic and truly a testament to the skill and creativity exhibited by the talented engineers at North American. There are a lot of great ideas in the airplane, many of which were incorporated in more modern designs. And, to the extent there is a superior aircraft aesthetic, the P-51 takes top position. Simply beautiful.

Still, flying the Mustang beats you up. No longer 19 years old, I felt pretty tired (and sore) after the first two days of what is normally a five-day, 10-12 hour training to checkout. The cockpit is hot and noisy. And this was without anyone shooting at us and with all systems functioning properly. The people who experienced real war while flying P-51s must have been exceedingly brave and robust. I can't imagine doing six-hour sorties, day after day, with periodic dog fights scattered in-between. Frightening!

Stallion 51 has "Slender, Tender and Tall" for sale, a beautiful P-51D model, modified to accommodate a passenger in the back. For training, we used a two-seat trainer version of the airplane, a TF-51, which is actually the more sought-after, due to its roomier canopy, plus a fuller set of controls for the rear seat passenger. Still, Stallion's D-model is very pretty. I told them that if Gisela liked her training we would consider a purchase. Gisela got to do a P-51 formation sortie during her flying and, of course, she loved it! So, what am I going to do now? T&T

Altitude Management

by LeRoy Cook

Basic airmanship obviously requires management of the third dimension of mobility, that of height, in addition to forward speed and left-right movements. An aircraft's ability to rise and descend means we must plan our actions to reach a point in space defined by distance in a vertical plane, not just map coordinates.

This seems simple enough at first, but, given the requirements of avoiding cataclysmic contact between aerial vehicles, as well the undulating surface of the earth, complexity arises. Altitude management takes some advance planning, not reaction to a developing situation. The traffic flow may require beginning and halting altitude changes at specific times and points, as planned and as directed.

Therefore, we not only need to know what altitude is required to achieve our objective of safe flight, we need to know when it's okay to descend, when or where we can start the climb, and where the greatest efficiency can be obtained. Choosing, maintaining and changing an altitude isn't always simple.

What altitude shall we ask for? Almost always, we're after comfort first, then efficiency. I asked an acquaintance about the long-range cruise power setting for his Cessna C510 Mustang. He said "FL 390 or 410." Unless chop is present at those altitudes, that's where his little Pratt & Whitneys do their best work, on the least fuel burn. Flying lower will often be required, but range will suffer.

As high-flyers soon learn, it can sometimes take twice as long to fly a route westbound as it will to return eastbound. One must balance fuel efficiency against ground speed, and plan contingency stops in case the winds do not improve, bearing in mind that descending for fuel and climbing back to altitude is costly. Modern FMS equipment can show "fuel remaining on arrival" almost instantly, and it's nice to be able to see the results of our efforts to "make fuel" by changing to a more favorable altitude. One can't always be successful in this endeavor, however, so having a solid-gold alternate for a fuel stop is important.

Just about every airplane has its "best altitudes", like the Cessna Mustang I referenced above. For normally-aspirated piston planes, it will be about 7,000 feet MSL. For those with turbocharged engines, the sweet spot will come at the critical altitude for maximum cruise power, where the turbo's wastegate is closed in order to maintain cruising manifold pressure. Further ascent results in a reduction in power output, because the turbo is already working as hard as it can. Most often, this occurs at around 16,000 to 17,000 feet.

Turboprop engines are normally aspirated, producing less power as one ascends, so the best altitude is one at which fuel efficiency, which improves with altitude, meets the highest true airspeed, obtained in the thin air before power loss at altitude becomes too great. Engine makers can "turbocharge" a turboprop by increasing compressor capacity and installing a more-robust turbine wheel that can withstand higher temperatures, then restrict sea-level horsepower to the maximum the airframe designer had in mind. The "flat-rated" excess power can be used to maintain sea-level output to higher altitudes, so it will be possible to fly faster up high, or fly at the same speed with less fuel burn.

Jets are heat engines, and will do their best work in the cold climes of high altitude, where airframe efficiency is best and the ratio between intake and exhaust temperature is greatest. The "best altitude" may be restricted by compressibility concerns as design Mach limit is reached at a slower TAS in the cold air. Aerodynamic stall meets Mach buffet at "coffin corner", at an altitude where maximum fuel efficiency may be found. With jets, it's best to fly as high as you can for as long as you can, and to climb as high as you can as fast as you can. As I was told in a recent conversation on the subject, "you can climb 10,000 feet for each 10 minutes of level cruise flight."

All of these desires, of course, are subject to the whims of air traffic control, which can't always accommodate a bunch of aircraft wanting to go the same way at the same altitude. Convective weather poking up into our most-desired flight levels wreaks havoc with the best-laid plans.

Precision flying requires maintenance of an exact altitude as well as a route's track and heading. Despite the inherent flaws in referencing a pressure plane that sometimes changes, and altimeters that may possess tens of feet of error, there's a certain satisfaction in holding a specific assigned altitude. In airspace designated for required minimum navigation performance, the tolerance for deviation may be small. Most controllers will call if your reported altitude is more than 200 feet off the mark. Transponders report each 100-foot of altitude at the mid-point of each increment, so being 250 feet off will show up as 300 feet.

Passengers Also Need Love

Altitude management must always be conducted with regard for the passengers' comfort and safety. While ATC protocol is based on a minimum climb/descent rate of 500 fpm when directed to vacate an altitude, we don't want to throw passengers against their seat belts (assuming they have them on) or spill drinks. In most cases, we'll be on autopilot and will direct flight-level change through the AFCS. Start with a click or nudge on the knob, to lower or raise the nose a bit, then add another couple of increments after the nose begins to move, inputting more attitude change in gentle advances. Power movements may also be subtly managed to avoid sudden changes in the noise level. There should be no perceptible G-load imposed on the cabin's occupants. You might like flying a fighter-plane, but they won't.

Positional awareness is certainly vital to the job of managing altitude, most particularly during arrivals and departures. A procedural altitude is only correct when it's verified by charted references. TAWS and synthetic vision warnings notwithstanding, the task of altitude management should be to prevent these tools from being activated, by knowing where we are and when we can go into relaxed-mode, safely above all hazards. Even in the flat country, towers can rear up 1,000 to 2,000 feet above the terrain; one airport I frequent, usually cleared for a visual arrival, is ringed by these too-tall spires of steel, and I caution pilots unfamiliar with the area to limit descent until established "in the slot" on final.

When Things Go Bad

Planning for abnormal or emergency conditions requires that you know where you're going, altitude-wise as well as laterally. If you lose an engine on a high-and-hot departure, you should know the level of climb performance to expect, and which way to turn if you find yourself lacking in capability. Climb gradient in feet per nautical mile can be roughly computed, using the two miles per minute of the common 120 knots Vyse of many airplanes. Thus, a required 200-feet-per mile gradient takes 400 fpm to meet, exclusive of wind. I can assure you, what appears to be possible on paper looks very intimidating from the cockpit, as one struggles to gain altitude with an ill airplane. The slightest downdraft negates all one's efforts.

If you're flying a single-engine aircraft, or a normally-aspirated piston twin near its single-engine ceiling, your contingency planning needs to be based on the inability to hold altitude after losing an engine. Always know the nearest landing facility and the heading to the safest, lowest terrain. There are always options, but you mustn't let them get out of reach.

Managing altitude is a piloting task that affects most of our other flight planning; range, endurance, obstacle clearance, and ability to reach the expected destination. Give it its proper due. T&T

Aviation Medicals

Winning the Vision Game

What I've learned in nearly 50 years of examinations

by John Loughmiller

Over the years, I've equated my yearly visit to an Aviation Medical Examiner (AME) to a sporting contest. In this game, you don't have a traditional opponent; the referee is your opponent. A win means the referee (the AME) signs you off, after going down the checklist of bad things. Either you didn't have any or he missed it – sort of like a referee missing a flagrant foul.

On the other hand, a "decline to issue" by the AME is a penalty flag and imposes a requirement for specialized tests that may or may not be covered by your insurance. There's no more flying as PIC until you convince the FAA's Civil Aerospace Medical Institute (CAMI) that you are unlikely to become incapacitated while exercising the privileges of your pilot's certificate. To continue the sports analogy, an eventual certification by CAMI means you still win, but in overtime.

Finally, in a small amount of these cases, you are told your flying days are over. In essence, the FAA has determined that the risk of you conking out in the cockpit is too great. It's the ultimate "Upon Further Review".

In this article, I'll share with you the steps I take to minimize the chances of a "decline to issue" situation when it comes to taking the vision test. First, we'll take a look at what you can do to minimize busting your exam due to vision problems and also delve into a potential vision trap that awaits you as you age. Next time, we'll look at coronary and cardiovascular issues and what you can do to avoid potential problems there.

Vision Issues

The FAA says that as long as near vision (16 inches distant) can be corrected to 20/40 or better, you're good to go. This is true for all three classes of medical certificate. To qualify for a 1st or 2nd class certificate, you also have to be able to see with acuity of 20/40 or better at 32 inches – a portion of the examination known as intermediate vision acuity. These requirements are not difficult to meet with a little help from your optometrist.

Distance vision is a horse of a different color. Maybe.

If you are going for a 3rd class certificate, distance vision uncorrected or corrected to 20/40 is good enough. 1st and 2nd class applicants, however, have to be able to see at a 20/20 acuity, uncorrected or corrected.

It's absurd, but it is what it is. The FAA's reasoning is that people who pay for your pilot services are entitled to a higher standard of safety than those who willingly climb in an airplane with you and aviate for free.

Passing the Visual Acuity Tests

To better the odds, resolve to not use contact lenses during your examination; they will not allow you to see as well as standard eyeglasses. Also, don't use multi-focus eyeglasses; use glasses relevant for each portion of the exam. It's too difficult to find the sweet spot on the typical machine used by the AME when wearing multi-focus eyeglasses, plus you often end up with your head tilted at an impossible angle and light transmission suffers. Finally, don't use glasses that darken when exposed to light. Again, you want maximum light transmission.

Next, visit your optometrist the week before your AME examination and request a complete eye examination including a color vision test. Tell him or her you need a printed report of the examination results.

Pilots like to be in charge – it's in our nature – and having the full optometrist's report in your back pocket helps keep control of the situation in your hands. If you fail the AME's acuity examination or color blindness tests, you can produce the optometrist's examination results and challenge the failure. Most AME's do not submit their equipment for calibration on a regular basis and know that their systems are not as accurate as those used by a Doctor of Optometry. Nine times out of ten, the report will trump the AME's exam and he will accept it. Worse case, he will require the optometrist to fill out an FAA 8500-7 report instead of accepting their standard examination documentation. It's the same information but in a format that CAMI is used to seeing and a CYA for the AME.

What else?

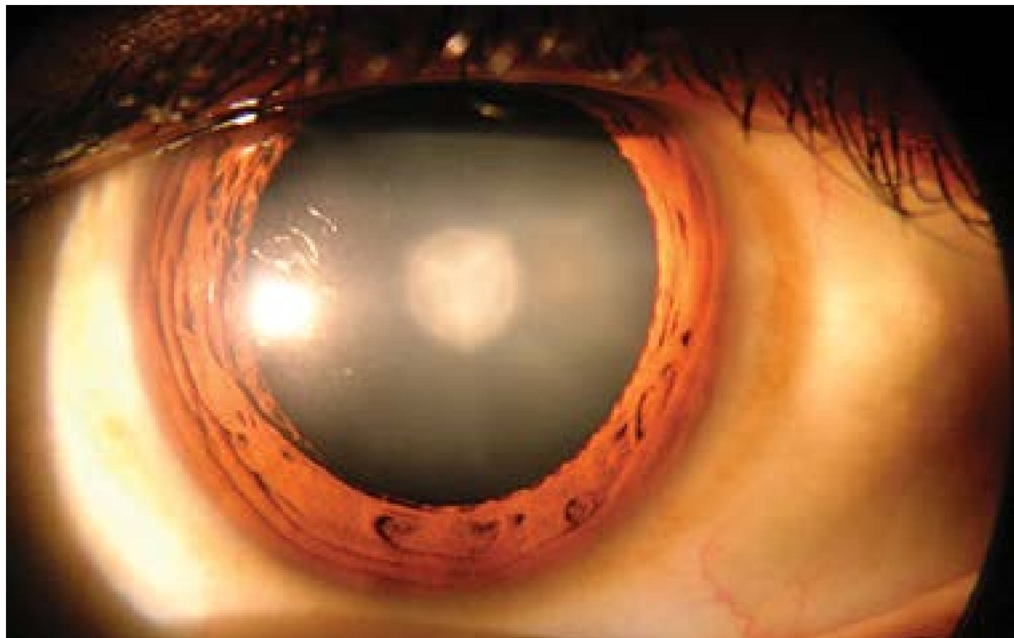
The human eye has a property called Dynamic Range. When you step out of a dark location into bright sunlight, the eye's iris immediately closes down and the brain ratchets down the sensitivity of the optic nerve to protect it from overload.

When you walk back into a darkened area, the iris quickly opens up but it takes time for the signal from the optic nerve to reach maximum again. Since most AME's do the vision tests first, this is significant. It means that you won't be getting maximum signal to your brain from your eyes (and therefore maximum clarity).

There is a countermeasure. Before you leave your house, don not one but two pairs of standard sunglasses. (Like the scene in the movie Airplane, where Captain Rex Kramer whips off one pair of aviator glasses only to reveal another pair.) Don't use sunglasses made from cast-off welders hoods; plain old $15-dollar plastic drug-store "blue blockers" will suffice. Place them in front of your regular sunglasses and accept the fact that you will look strange to people you may meet along the way.

Keep both pairs of sunglasses on until you are inside the AME's building and then wear the remaining pair until you are in the room where the vision test is given.

When the person administering the test is ready to proceed, remove the second pair of sunglasses and press your face against the machine's visor. The result is, you'll have the maximum signal possible from the optic nerve to the brain and - assuming you are wearing the best eyeglasses possible - have done all you can to improve your vision score.



Cataracts

Finally, here's a heads up on a problem you will likely encounter towards the end of your flying career: Cataracts. A cataract is a cloudiness of the lens that is positioned between the eye's cornea and retina. As we age, cloudiness often appears and then becomes greater and greater. Eventually, it becomes impossible to correct the problem using eyeglasses or contact lenses, rendering you unable to pass the FAA vision examination – even a 3rd class medical certificate requiring only 20/40 distance vision.

To fix the situation, the cloudy lens is removed surgically and a new lens is inserted into the eye. The problem is, many private insurance plans will not cover cataract surgery until your distance vision degrades to 20/50. Fortunately, it's sometimes possible for a surgeon to receive a waiver by showing that significant lifestyle challenges or unemployment will occur without surgery. Pilots flying with 1st or 2nd class certificates and private insurance should investigate this option.

It's also possible for the surgeon to document that glare is degrading the person's night vision to 20/50 or worse, even though basic vision is still better than 20/50. In that case, most private insurers will also grant a waiver.

Medicare and Cataracts

For those having Medicare coverage (which, unfortunately, is what the great majority of pilots with cataracts are going to have), there is a greater challenge.

With Medicare, the 20/50 distant-vision rule applies in most regional Medicare fiefdoms and there is no procedure for requesting a waiver. In essence, a surgeon is taking a chance if he or she performs cataract surgery on someone who has distant vision better than 20/50, since an audit by the Medicare bureaucrats could bring a very substantial fine and sanctions.

On the other hand, if glare degrades a person's night distant vision to 20/50 or worse, and the doctor properly documents that the requisite tests for glare were done, chances are he may feel comfortable performing the operation. Discuss this aspect with a potential surgeon if he or she seems leery of repairing your daytime distant vision when it isn't 20/50 or worse.

Also, go over the FAA documentation requirements beforehand and make certain that the surgeon is willing to jump through those hoops, or it will all have been in vain as far as keeping you in the air is concerned. Your AME can advise you what the surgeon needs to provide before you go for your pre-surgery evaluation and supply an FAA 8500-7 form to give to the surgeon as well. If you have the proper paperwork after the surgery, the AME can issue you a new medical certificate at the time of your examination without CAMI intervention. T&T

John Loughmiller is a freelance writer, commercial pilot and CFIIMEI-A. He retired from the business world a few years back and is now living the dream as a contract pilot flying various piston and turboprop twins.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Twin Proficiency:

Feather it Slowly

by **Thomas P. Turner**

I was observing the demonstration of a piston twin Flight Training Device, or "simulator," at a major university, where I was a consultant in the development of an "ab initio" airline pilot training program. Flying the "sim" was a senior airline captain who was also a consultant on the project. While the captain was at cruise speed, descending in a left turn on vectors for an instrument approach intercept, the sim instructor caused the right engine to fail.

Initially, the captain noticed nothing. A failed engine on the outside of a turn will tend to reduce the angle of bank. The natural reaction is to simply add more aileron to maintain the turn. High speed makes the flight controls more effective, so it only takes a small input to offset undesired performance. So, the captain adjusted his rudder and aileron just a bit as he continued his descending turn. He had timed it so he reached his assigned heading and altitude at about the same time, so he leveled the wings, raised the nose and throttled both engines way back to slow down. He may have noticed when that the airplane wanted to roll to the right, into the dead engine, but if he did he simply adjusted his ailerons to keep the wings level. Airspeed decreased rapidly and he subconsciously compensated.

His near-idle power setting meant there was little asymmetric thrust and, therefore, little indication the right engine was dead. As the decelerating twin reached the target approach speed, the captain advanced the throttles to maintain speed in level flight. That's when he noticed the indications of a dead engine. The increase in asymmetric thrust at power-up, combined with the reduced control authority at approach speed and the departure from his desired approach course, made it clear something was wrong.

The captain's training kicked in; he pedaled the rudder to hold heading, and he slammed all six engine controls – throttles, propellers and mixtures – fully forward. Then, in one swift, continuous move, he reached over, grabbed the propeller control and hauled it into the feathered position…on the wrong engine.

Grab and feather

Feathering the working engine's propeller isn't that uncommon. I saw pilots do it a lot when I was a piston-twin simulator instructor. It was usually the confident pilots, the ones who flew very well and often, who made this terrible mistake. As soon as they detected an engine failure, they would blaze through the engine-out procedure, rising to the challenge and spring-loaded to quickly feather a propeller, as if to demonstrate just how great a pilot they are.

Almost always, the pilot feathered the left propeller when I presented a failure of the right engine, even after properly identifying and verbalizing failure of the correct engine. Because most piston twins have a critical engine on the left, multiengine instructors tend to favor "pulling" the left engine. This means, in almost all cases, when a pilot feathers, or zero-thrusts, it's the left prop. The experience and muscle memory developed in training reinforces feathering the left propeller.

Caught on tape

Although engine-out procedures for turbopropeller airplanes differ from those in piston twins, this left-engine training bias may have been a factor in a very high-profile airline crash. TransAsia Flight 235 was an ATR 72-600, departing Taipei, Taiwan, on February 4, 2015 with 53 passengers and five crew for a domestic flight. Two minutes after takeoff, the crew reported an engine "flameout", climbing to a maximum height of 1,500 feet before banking steeply left and descending. Dramatic dashboard camera images of the airplane rolling nearly inverted, before impacting a highway bridge with the left wing and crashing, received wide distribution.

Taiwan's air crash investigative authority, the Aviation Safety Council (ASC), released a factual report on the crash on June 30. Investigators determined that

> …less than a minute after takeoff, once the plane had climbed 1,200 feet, a master warning sounded, and a display showed that there had been an engine flameout, or power failure, in engine 2 (the right engine). The captain responded by pulling back on the throttle – but on the other, working engine, shutting it off about 46 seconds after the other engine failed, causing the aircraft to stall. The mistake was not noticed until about two minutes later, when the pilot managed to restore some power to engine 1 (the left engine) but it was too late to avoid the crash.

The captain's last recorded words were, "Wow, pulled back the wrong side throttle."

The video shows what appears to be the transition from a wings-level, high angle-of-attack descent to a Vmc roll-like departure from controlled flight – the stall to which the report refers.

Avoiding the snatch-and-yank trap

When I had use of a realistically performing type-specific Flight Training Device, I demonstrated the need to be expeditious but methodical when dealing with an engine failure, and how, as long as you maintain airspeed and directional control, you have ample time to work your way through the "identify, verify, feather" process.

To make this clear, I'd brief the pilot receiving instruction (PRI) I would present an engine failure, and all I wanted him or her to do was to hold the nose on the horizon, keep the wings level, and apply rudder as needed to maintain heading. In the Beech piston twins, the gear up/flaps up attitude for Vyse with a windmilling propeller is about three degrees nose up, and zero sideslip occurs at two to three degrees bank into the good engine, with about 1/3 of a slip/skid ball displacement.

Wings-level with the nose on the horizon is very close to this optimal attitude/bank combination, an easy target under the stress of an engine failure in flight.

With the pilot well-briefed on responsibility – nose on the horizon, maintain heading, and nothing more – I presented an engine failure and let the PRI do his/her thing. Done correctly, the airplane would remain under control in a 200-400 fpm descent. The airplane was not going to careen into a Vmc roll as long as the pilot held that attitude, and the rate of descent was less than a normal final approach, with plenty of control authority to flare.

In other words, hold pitch and heading with a flare just before impact, and the worst that will happen is a wings-level, controlled slide into the ground, for which the airplane structure is designed to protect its occupants. That's a far better outcome than an out-of-control crash from addressing the wrong engine.

We repeated the exercise a few times, and then I'd tell the pilot to accomplish the entire engine-out checklist, quickly but unhurriedly, while holding attitude and heading. We did this at high altitude in situations where the engine would restart in response to checklist steps, like turning on a fuel boost pump, and when it would not restart, requiring feathering the propeller. We did failures right after gear retraction, so restart steps were bypassed to get the propeller feathered as soon as practical. In all cases, the pilot found an ability to methodically work through the actions of the Engine Failure in Flight checklist with plenty of time to confirm the correct propeller was being feathered.

Stop the turn

Another simulator exercise was to introduce engine failures while the airplane was in a turn. As I said earlier, if the engine opposite the turn fails, especially at cruise speed, it tends merely to decrease the bank angle. You may instinctively apply more control to maintain bank angle, and might not notice the failure until you roll out of the turn.

A failure on the same side as the turn ("inside engine") will steepen the bank angle and cause the nose to pitch downward, but at high speed you still might instinctively apply control inputs and not recognize the situation until the end of your turn. If you do detect an engine failure while turning, the rudder input required to maintain the turn may make the "dead foot, dead engine" identification process less obvious, contributing to improper engine identification.

All of which suggests that you're most likely to correctly identify a failed engine when holding a constant heading. In other words, be wary of control inputs required when you roll out of a turn, and if you suspect an engine problem while turning, pick a heading and hold it before continuing with the engine failure and feathering procedure.

Do the two-step

There's one last thing you can do to avoid feathering the wrong propeller. Make "verify" in your "identify, verify, feather" procedure a two-step process. First, do what is universally taught – pull the suspected dead engine's throttle aft and confirm there's no change in control requirement needed to hold heading (this is why holding a constant heading while identifying and verifying a failed engine is so important). Then, do a second verification by grasping the dead engine's propeller control and pulling it aft to the feather detent – but not beyond – without letting go of the control. If there's still no change in control input needed to hold heading, you have the correct propeller knob; pull it into feather. If the heading changes or it takes more or less rudder to hold heading with this second verification, you have the wrong prop handle in your hand; move it forward and try the verification with the other propeller control.

More pilots than you'd think snatch the wrong propeller control into feather when dealing with an engine failure in flight. Often it's the higher-time, more-confident pilots who make this mistake. It's vital to make control inputs immediately to maintain control when an engine dies, but it's critical to be methodical in identifying, verifying, and only then feathering the propeller. 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.

From The Flight Deck

by Kevin R. Dingman

Take Control

What do you enjoy? Gently resting the pad of a finger on a four pound test line then, one click at a time, trying to convince your favorite fish to bite? The smell of fresh-cut grass while waiting for frost or dew to recede from the greens? Gardening, cooking, building things or music? Or is it more of a nurturing endeavor: showing the grandkids how to tie a square knot, operate a gyroscope, keep a kite airborne or learn that the roots of a sassafras sapling smell like root beer?

Maybe you like all of the above but also enjoy being at the airport with family and fellow aviators, sometimes if only to enjoy the airport smells and sounds, view the artistry of flying machines and hear and speak "piloteze." Occasionally making a spur-of-the-moment trip – taking control of your machine to become a physical part of life's adventure. Do we only fly to increase the efficiency of our business, and thereby its profitability? Is it to save on our most valuable asset – time? Or is our reason to fly the popularly-accepted new paradigm: to avoid the inefficient, inconvenient and occasionally embarrassing aggravation of the TSA/public transportation process? Or could it be more personal and selfish.

We the People

Recently in the U.S, it appears that we've transitioned to a more politically-correct, diversity-intense and tolerant, socialist society. The rulings handed down this summer serve to remind us that our values, freedoms, and perhaps some of our favorite things from above, exist in accordance with a judicial and political system that's sometimes only marginally influenced by the majority. Could our general aviation freedoms be modified or taken away as easily, just as airport screeners seized our scissors, shoes and shampoo? While repeatedly challenged by a few, general aviation continues to give us the freedom to come and go as we please, on a course of our liking, to destinations of our choosing. Except for the occasional zig-zag caused by a TFR, NPRM or AD, We The People of GA are still in control. It's a gratifying Declaration of our Independence but are we neglecting the creativity that makes our technology and aviation freedoms possible? It's been said that when you take man out of the adventure, you take adventure out of the man. Our desire to defend GA must be resolute.

We fly because our heart is in aviation and we love airplanes, to be physically present and to have control of the adventure. And if control is the reason, isn't that enough? Why do we climb into a deep-sea submersible, blast into space, or fly above the earth, instead of sending a pilotless vehicle or observing a video screen? It's because we enjoy being in the driver's seat at the controls, becoming the architect, facilitator and witness to the voyage. To be responsible for how it goes. We need not be ashamed and our motives need not be cryptic or esoteric – maybe only a bit ethereal, since we experience sights and emotions unavailable to wingless humans and politicians. Even those that fall into the profitability or shoe-and-shampoo-retention reasons to fly, denying the satisfaction of control, must concede that control is indeed the reason that resonates most honestly and faithfully. We have a connection with our airplanes, out of both desire and necessity.

Say Again

I flew the Duke to Mackinac Island, Michigan a few weeks ago; just for the day. A very nice King Air pulled into a parking spot near me as I was installing the chocks. A group of six passengers climbed out, followed by a senior pilot wearing a uniform with four shoulder stripes – the Captain. He was followed by a younger pilot wearing three stripes – the First Officer. I couldn't help but eavesdrop on the conversation between the passengers and crew. At first, I thought it was a chartered flight; the routine was polished and the pilots were very respectful and subservient to the passengers. The group was headed to the Grand Hotel for three days, so the crew was to pick them up on Friday. Then the crew unloaded their own bags and secured the plane – they would wait on the island. In the terminal lounge, I continued to eavesdrop. I overheard one of the ladies say to another "say again?" Well, you and I both know what group of people use that phrase instead of "huh, what or pardon me." Holy cow, I thought, she's a pilot, it's her plane and she hired a crew. I can only speculate on the reasons to hire a crew. I know that I've wished for a crew a few times, when my passengers were allowed to imbibe and stay up late while I had to remain clearheaded and rested for the return trip.

Her arrangement made me realize how much of our thought process is absorbed by the task of flying a complex airplane. If you only have a few days to unwind and enjoy the destination, removing the flying task from your brain can make a difference. Most people don't know that we aviators think about flying constantly. For example, we have a sense of things in flight that is supplemental to the physical task of flying – things that are a subliminal component of piloting. Whether pressurized or unpressurized, we can smell our environment, we can hear and feel changes in temperature and pressure and, perhaps most notably, through our mind's eye, we can see hundreds, even thousands of miles across multiple weather systems and terrain. When a layperson sees a flash of lightning, they think wind, rain and thunderstorm. A pilot, in flight or on the ground, will think the same but with a global, or at least a continental, perspective.

The wider perspective is due to an understanding of the cause and effect of planetary airflow, the heating and cooling of oceans and land masses, the circulation around high and low pressure systems and the relationship of temperature, pressure and dew point on the creation of weather and the lightning flash. We also have a keenly-developed appreciation, respect and, rightfully so, fear, of the components inside of the storm: windshear, intense rain, ice, hail and tornadoes. Because of both our physical and mental perceptions, the level of understanding extends across multiple disciplines and encompasses aspects of flight beyond just the weather. From topography, fires, earthquakes, floods and social gatherings, to riots and war, we see and perceive a plethora of information and events from our perch above the earth.

Screw the Pooch

My unauthoritative assessment is that pilots share a common personality trait: we seek out and enjoy the multi-faceted gratification of flying an airplane. We like the interdisciplinary relationship between the science and art of flying, and the fulfillment we get from merging these contrasting disciplines together. The preparation, planning, scheduling, decision making, responsibility, artful execution and, finally, the completion of the mission. Oftentimes, in fact, we enjoy the completion component the most; the "post-flight-relief" after closing the hangar door. Sometimes we are covertly grateful, like Gus Grissom, to have not "screwed the pooch." We gaze at the machine

in gratitude, knowing that it is the one that performed the real work, as it once again overlooked our minor mistakes in the execution of a sometimes complex and tasking flight. We admire its form and function, engines crackling; imagining that the machine is resting, like a horse after a run. Maybe we say a word or two of admiration to the airplane, the artistic device that facilitates our flight. No one needs to know that we talk to our airplane; they wouldn't understand. Just as we mumble to our golf ball, to the fish in the lake and to ourselves; let them believe it's a deep-in-thought, focused and contemplative exercise.

August is the month in which The Babe played his last game of baseball, She Loves You (Ya, Ya, Ya) was released in the UK, the first A.L.T. (approach and land test) was conducted on the shuttle Enterprise and, in August of 1993, the Dow set a record at 3,638.96. My, how time flies. With a historical and politically inferred perspective, I invite you to consider my anthropomorphic view of airplanes as we celebrate National Aviation Day, also observed in August, on the 19th . The date coincides with the birthday of Orville Wright and celebrates the history and development of aviation; and, with creative license, may I add, the freedom and control it provides.

While We Can

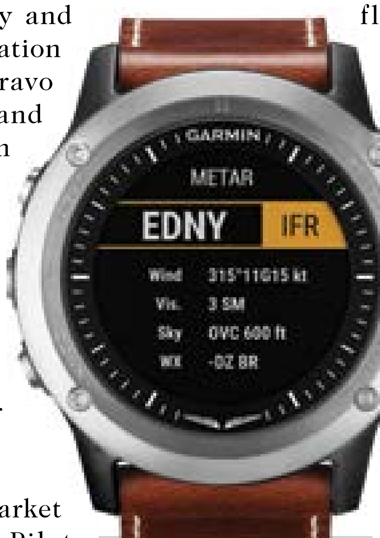
It's okay to reward ourselves by flying for enjoyment, to take advantage of the freedom and control. Shall we celebrate our appreciation for aviation this month and fly the airplane somewhere inefficient and pointless, just because we can, while we still can? A couple-thousand-dollar pancake breakfast, a golf or fishing excursion, or dinner and a movie in another country. Hire a crew if you want, but good luck separating your heart from the machine and your pilot brain from piloting – I say again. 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.

Garmin® Introduces Next-Generation Aviator Watch

Garmin International Inc. has introduced D2 Bravo, a next-generation aviator watch that combines practical functionality and sophisticated design to bring pilots and aviation enthusiasts a premium GPS watch. D2 Bravo incorporates Garmin's signature direct-to and nearest airport navigation features, complete with a worldwide aviation navigation database. New and exclusive benefits, such as altitude alerts and easy access to current aviation weather information, set D2 Bravo apart from other pilot watches on the market. With a stainless steel bezel and domed sapphire lens, D2 Bravo combines Garmin's GPS and wearable technology with a sophisticated new form factor suitable for pilots and aviation enthusiasts alike.

"Garmin revolutionized the aviator watch market with the introduction of the original D2 Pilot Watch and we're thrilled to introduce the second generation with the D2 Bravo," said Carl Wolf, vice president of aviation marketing and sales. "Whether you're a pilot looking for a back-up navigator to supplementyour flying with valuable alerts and flight plan data, or you're an aviation enthusiast interested in a practical timepiece to view valuable in-flight information, D2 Bravo encompasses a number of exclusive features tailored to those living a jetsetter lifestyle."



D2™ Bravo Combines Innovation with Functionality

D2 Bravo's new omni-directional stainless steel EXO™ antenna contributes to a slimmer design and, with improved GPS technology, provides an even faster GPS fix and accurate position than GPS alone. D2 Bravo boasts a sunlight-readable, high-resolution color display with an LED backlight. Featuring a longer battery life than its predecessor, D2 Bravo can operate up to six weeks in watch mode and 20 hours in GPS mode.

When paired with a com-patible smartphone, aviation routine weather reports (METARs) are displayed on the face of D2 Bravo in plain language, color-coded to indicate visual or instrument meteorological conditions. D2 Bravo uses the built-in altimeter to provide preset altitude alerts, which remind pilots when to use supplemental oxygen at critical altitudes where oxygen may be required, providing vibrating alerts in 30-minute intervals to notify the pilot when cabin pressure is at or above 12,500 feet.

Pilots can quickly navigate direct-to airports and create Mark on Target waypoints for easy navigation to customized locations. Similar to Garmin portables, customizable data fields display GPS ground speed, GPS track, distance, altitude, estimated time en route, bearing, glide ratio and more.

D2 Bravo is expected to be available in July and has a suggested retail price of $699*. Also included with the purchase of D2 Bravo is a six-month free trial of Garmin Pilot. Visit *www.garmin.com*/aviation for more information. T&T

**Manufacturer's Suggested Retail Price (MSRP)*

Garmin Announces Garmin Pilot 4.3 for Android

Garmin has announced an updated version 4.3 of the Garmin Pilot app for Android, which incorporates the display of both terrain and obstacles over the top of Garmin's navigation maps. These overlays display visual alerts of potential hazards and enhance situational awareness, particularly in unfamiliar environments. Version 4.3 for Android also supports X-Plane 10 and other compatible simulators, offers the option to display density altitude information, and now includes a new subscription options.

Obstacles and Terrain Information

Garmin Pilot version 4.3 provides pilots with the option to overlay terrain and obstacles simultaneously on the moving map page, in track-up format to ensure that flight plan information is upright and easy to read. Pilots also have access to a dedicated terrain page, so they may view terrain and obstacles in an arc or 360-degree view.

With a premium upgrade, intuitive colors can help pilots easily discern their proximity relative to terrain. Pilots are provided visual caution or warning alerts when operating near obstacles or terrain that may be of potential conflict. The terrain data uses highly-detailed data in Garmin avionics and portables and is available in various resolutions, so pilots can select the level of detail they prefer.

Simulator Support

Garmin Pilot now supports X-Plane 10, as well as a variety of other compatible simulators. Customers may launch X-Plane and connect Garmin Pilot to the simulator. Garmin Pilot then sends AHRS information to display flight plan information.

Density Altitude

Pilots can optionally display density altitude information within Garmin Pilot in the METAR widget. By viewing widgets in split screen mode, density altitude is calculated and displayed.

New Enhancements and Pricing on Optional Upgrade Packages

Garmin Pilot's upgrade packages have been enhanced to include visual and aural terrain and obstacle alerting. New packages include:

VFR Premium - $49.99 annually, which adds geo-referenced SafeTaxi diagrams along with terrain and obstacle alerts

IFR Premium - $74.99 annually, includes features within VFR Premium along with geo-referenced FliteCharts

For more information, visit *www.garmin.com/apps*. T&T

Avidyne Extends ADS-B Product Portfolio with Addition of MLX200 & MLX210 978Mhz Transceivers and APX 322 Remote ES Transponder

On April 8, 2015, Avidyne Corporation announced expanded *ADS-B 978 Series* Automatic Dependent Surveillance-Broadcast (ADS-B) solutions, to include the MLX200 and MLX210 transceivers. Both products are designed for Avidyne customers flying below 18,000 feet in Continental United States (CONUS) airspace who wish to meet the upcoming mandate for ADS-B OUT and receive FIS-B weather and traffic via ADS-B IN on their Avidyne displays.

The MLX200 provides 978-MHz ADS-B IN and ADS-B OUT for display on Avidyne's IFD540 and IFD440 GPS/NAV/COMs and EX500, EX600 or EX5000 multi-function displays. The IFD540 and IFD440 provide a compliant GPS source needed for ADS-B. The MLX210 is the same as the MLX200 but with a compliant GPS sensor built in, for customers with an Avidyne EX500, EX600 or EX5000 MFD, but without a compatible or compliant GPS.

Pricing and Availability

The MLX200 transceiver has a retail price of $3,495 and the MLX210 is $4,995. Prices include connector kit; antennas are sold separately.

AXP322 Remote Mounted Transponder

Avidyne also announced the AXP322 remote-mounted Mode S Extended Squitter transponder with ADS-B Out. The AXP322 can be controlled by IFD540 or IFD440 GPS/NAV/COMs, which provide GPS position input to the AXP322 for extended-squitter ADS-B Out broadcasts. Avidyne previously certified its panel-mounted AXP340 Mode S Transponder with ADS-B Out. Equipping with the AXP322 or the AXP340 allows general aviation aircraft owners to meet the Federal Aviation Administration's (FAA) NextGen mandate, as well as international requirements for 1090 MHz ADS-B Out, when coupled with an approved GPS source.

The AXP322 is a remote-mounted Class 1 (250Watt), Mode S, Level 2 1090MHz datalink transponder with extended squitter (ES) that meets all the requirements for Mode S elementary surveillance for both IFR and VFR flight. The AXP322 Mode S Transponder has a retail price of $5,450 and will be certified and available in May 2015.

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

Million Air Stennis Grand Opening

Freeman Holdings Group recently hosted a grand opening for its newest Million Air FBO facility, at Stennis International Airport (KHSA) in Bay St. Louis, Mississippi. The newly-constructed $7-million facility includes 7,500 sq. ft. of FBO, 25,000 sq. ft. of hangar space and over 500,000 sq. ft. of ramp space, capable of handling all types and sizes of aircraft.

For persons traveling to southern Mississippi's Gulf Coast, Million Air Stennis offers the first-class service and luxurious facilities guests have come to expect with the Million Air brand. Visitors to Stennis will enjoy two lounges, a flight planning room, two pilot snooze rooms, a multi-media conference room and a state-of-the-art theatre room. The real magic happens on the second floor of the FBO in the Jet-a-way Café, where the sky lounge overlooks the airport and ramp area, for a stunning view of the action taking place on the ramp.

"It's a wonderful airport in a great location, with excellent runway, taxiway and ramp space," said Scott Freeman, CEO of the Freeman Holdings Group. "The only thing it was missing was a first-class FBO facility. It has that now in a very big way! The building's architecture, design and décor are as impressive as you will see anywhere in the country." Million Air Stennis offers quick and easy access to all the Mississippi Gulf Coast cities and attractions and is less than an hour away from New Orleans. With 8,500 feet of available runway, Stennis has been the host to some of the world's largest aircraft.

For more information, visit *www.millionair.com.* T&T

Cessna Citation Latitude Certificated

As of June 5, Cessna Aircraft Company, a subsidiary of Textron Aviation Inc, announced that its Citation Latitude business jet has achieved FAA type certification. Deliveries are scheduled to begin in the third quarter of this year. The new Citation Latitude represents the perfect balance of comfort and efficiency and is the first business jet to combine a roomy, flat floor and stand-up cabin with a midsize price and best-in-class operating costs.

"From inception, we looked at every aspect of how we design, build and deliver new products to the market, with the goal to further improve upon the key attributes that make the Citation so highly esteemed," said Scott Ernest, president and CEO of Textron Aviation. "Throughout the certification program, the Latitude demonstrated breakthrough results, which are evident in the aircraft's performance and value proposition. And now, customers can experience firsthand how the Latitude can reduce operating costs, while increasing productivity and profitability for their businesses."

Performing beyond expectations

The Latitude is entering the market with enhanced performance specifications, including increased range of 2,850 nm at long-range cruise and 2,700 nm at high-speed cruise, as well as improved runway performance of 3,580 feet, all of which are reflected in final certification results. Among the first customers is NetJets, which has ordered up to 150 Citation Latitudes, with initial deliveries beginning in 2016.

Innovation in the factory, leadership in certifying new products

Assembly of the Citation Latitude features a variety of technological advancements including the use of new automated robotics, monolithic machined structures and ergonomically-friendly tooling stations, resulting in greater precision throughout the build process. Through these advancements, customers benefit from the highest quality, increased maintenance intervals and reduced aircraft down-times. This, combined with the Latitude's increased performance, results in up to 20 percent lower operating costs than competing aircraft.

The flight test program for the Latitude began with its first flight in February 2014 and grew to include four test articles that flew 690 flights and amassed 1,697 flight hours. The accelerated test program validated the maturity of the Garmin G5000 avionics system and features such as the new auto-throttles.

The Citation Latitude features a larger fuselage accommodating up to nine passengers, with a flat cabin floor and six feet of cabin height. Improving cabin comfort for passengers and crew alike, the Latitude features a new cabin cooling system and a new pressurization system, which provides a 5,950-foot cabin altitude at the aircraft's maximum operating altitude of 45,000 feet.

The company's super-midsize Citation Longitude is expected to be certified in 2017.

For more information, visit *www.txtav.com* T&T

Avidyne's IFD440 and Release 10.1 Software for IFD540 Certified

Avidyne has announced certification of the IFD440 FMS/GPS/NAV/COM and Release 10.1 software for the IFD540 FMS/GPS/NAV/COM. Release 10.1 (R10.1) software is a field-loadable upgrade that provides IFD540 owners with product improvements and new functionality. It includes support for display of ADS-B weather, scrollable data blocks, expanded checklists, rubber-banding of the active flight plan leg, and multiple-user customization of checklists, user settings, user-defined waypoints, routes, and more. R10.1 also adds support for control of Avidyne's new remote-mounted AXP322 remote transponder and enables the recently-announced MK10 Mini Keyboard for wireless control of the IFD540 and IFD440 via Bluetooth®. The now-certified IFD440 has a plug-and-play list price of $14,995.

The Release 10.1 software upgrade will be offered at no charge for all current IFD540 customers. Once certified, Avidyne will begin scheduling orders for the R10.1 upgrade through authorized dealers.

Avidyne previously announced their MLB100 ADSB-IN receiver that is designed for IFD540 or IFD440 customers who are equipped with an Avidyne AXP340 Mode S Transponder with 1090MHz ADS-B OUT and want ADS-B IN. The MLB100 provides a great FIS-B weather and traffic solution for aircraft flying above 18,000 feet in the CONUS. Release 10.1 software is required in the IFD540 and IFD440 in order for them to display ADS-B information. The MLB100 receiver is priced at $2,495.

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

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- 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
- 186 GULFSTREAM G-III
- 188 GULFSTREAM G-IV
- 317 GULFSTREAM G-IVSP
- 182 GULFSTREAM G-V
- 40 HAWKER 1000A
- 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
- 15 JETSTREAM 41
- 15 LEARJET 23
- 26 LEARJET 24
- 5 LEARJET 24A
- 19 LEARJET 24B
- 53 LEARJET 24D
- 14 LEARJET 24E
- 9 LEARJET 24F
- 33 LEARJET 25
- 57 LEARJET 25B
- 7 LEARJET 25C
- 94 LEARJET 25D
- 6 LEARJET 28
- 28 LEARJET 31
- 172 LEARJET 31A
- 43 LEARJET 35
- 426 LEARJET 35A
- 21 LEARJET 36
- 34 LEARJET 36A
- 24 LEARJET 40
- 219 LEARJET 45
- 193 LEARJET 45XR
- 115 LEARJET 55
- 5 LEARJET 55B
- 12 LEARJET 55C
- 293 LEARJET 60
- 130 PREMIER I
- 16 SABRELINER 40
- 13 SABRELINER 40A
- 7 SABRELINER 40EL
- 3 SABRELINER 40R
- 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
- 303 CONQUEST I
- 354 CONQUEST II
- 49 KING AIR 100
- 502 KING AIR 200
- 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
- 1 MITSUBISHI MU-2D
- 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

TWIN&TURBINE

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ON FINAL

by David Miller

Weather Worries

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.

In June, my usual jaunt from Dallas Addison (KADS) to Gunnison, Colorado (KGUC) became a bit more interesting. About this time each year, the moist southwesterly flow, known as the "monsoonal season", begins. This year, however, Mother Nature decided to make it more personal by producing hurricane Blanca. She dropped huge amounts of moisture over Los Cabos in Mexico and then blanketed the Rockies with torrential rains.

I cancelled my planned trip to Gunnison.

The next week saw a number of areas of low pressure parked over the western US and the winds aloft at FL410 were not moving the systems much. Departure weather for my next attempt showed mostly clear skies until the front range of Colorado, and then lots of moisture.

KGUC (Gunnison) – 0000KT 10SM FEW055 09/06

KTEX (Telluride) – 0000KT 10SM -RA SCT024 OVC033 11/09

KASE (Aspen) – 13003KT 5SM RA BR FEW015 OVC022 09/09

KMTJ(Montrose) – 13006KT 10SM BKN100 13/12

Forecasts for the airports around KGUC called for visibilities of 5-6 miles, showers in the vicinity, and ceilings of 2000-4000 scattered to broken with thunderstorms two hours after my arrival. Gunnison does not issue a forecast and I departed KADS using my usual alternate of Montrose. Just as forecast, as soon as we passed west of the front range, the low level moisture appeared.

I am always skeptical of the A01 weather reporting around the Gunnison airport, after listening to numerous recordings of "clear below one-two thousand" over the years. I am not sure exactly where that sensor is looking, but often there are lots of clouds very near the airport. So, on this day, as I heard the same friendly recording, I planned on the ILS to runway 06. Sure enough, we were in clouds and icing at 14,200 feet (the minimum vectoring altitude), 5 miles from the airport.

After a routine approach we were on the ground.

The trip home was also challenging. Dallas had been flooded with record-setting rains (19 inches in May alone) and June was starting out equally moist. Our 0900 departure from Gunnison was planned to avoid the forecast TRW's after lunch time in Dallas. At FL410 we were on top of most of the developing storms around the Texas Panhandle. But NEXRAD showed me that a change in the STAR would be necessary to skirt the building cells on the GREGS7 arrival to Addison.

"Fort Worth Center, November 1865 Charlie would like to go direct to ZANTO on the arrival for weather. And is anyone getting in between the cells ahead?"

"It looks like most are deviating east to join the arrival," came the encouraging response. Needless to say, I was at full attention as we descended out of FL410 between cells. With all our ice protection on, the ride was remarkably smooth through multiple layers all the way down to bases of 2,500 feet.

As we drove home from the airport, it started to rain. It was a satisfying day.

Fly Safe.