

Thomas P. Turner's Mastery of Flight®

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FLYING LESSONS for August 14, 2026

FLYING LESSONS uses recent mishap reports to consider what *might* have contributed to accidents, so you can make better decisions if you face similar circumstances. In most cases design characteristics of a specific airplane have little direct bearing on the possible causes of aircraft accidents—but knowing how your airplane's systems respond can make the difference in your success as the scenario unfolds. So apply these FLYING LESSONS to the specific airplane you fly. Verify all technical information before applying it to your aircraft or operation, with manufacturers' data and recommendations taking precedence. **You are pilot in command and are ultimately responsible for the decisions you make.**

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This week's LESSONS

I'll give away a secret about scenarios I often present as part of a combined Flight Review and Instrument Procedures Check (IPC). Departing out of my home 'drome of Colonel James Jabara Airport (KAAO) on the northeast side of Wichita, Kansas, I'll have briefed my Pilot Receiving Instruction (PRI) that we'll fly the short distance up to Salina, Kansas (KSLN). Assuming we're doing this under Visual Flight Rules so we have more flexibility about routing and procedures, I'll play air traffic controller as the PRI enters climb and dons his or her favorite view-limiting device on a "clearance" direct to the destination airport.

There are two versions of my scenario. In **Version 1**, which I've encountered "for real" once, when I simulate handing the PRI over to Kansas City Center a little north of Jabara I tell my student:

November 12345, Kansas City Center radar in your area has just gone out of service.
Proceed direct FLOSS intersection, then hold east of FLOSS and expect a revised clearance to Salina.

In a non-radar environment all pilots must navigate themselves. Most enroute navigation must be on charted airways with required position reports so controllers can still provide sequence and separation services to IFR aircraft. In **Version 1** GPS is still available to the pilot, and that's the point: I want to see if the PRI knows how to create and fly uncharted holding patterns and navigate on Victor airways with whatever avionics are available, or to teach it if necessary. This is especially interesting when the airplane's navigation device does not have airways in its database and requires manual input of every fix to plot the route. I'm in the same boat as everyone else in not seeing this a lot in the real world...and it's been a very long time since I made position reports "for real." So this is a good avionics and regulatory review and cockpit management scenario.

Version 2 starts the same way, except that about the time I simulate the handoff to KC Center I tell the pilot every GPS in the airplane suddenly lost its signal. After September 11, 2001 I'm convinced the very first thing the National Command Authorities will do upon detection of an imminent or in-process major terrorist activity will be to jam or shut down civilian access to GPS. It seems increasingly likely such a shutdown might itself be the objective a possible terrorist attack. Less dramatic but much more likely to be encountered, Notices to Airmen (NOTAMs) for localized GPS outages from military training have become common in recent years.

In this scenario the objective is for the pilot to make the transition to ground-based enroute and terminal navigation. Given the nature of **Version 2** me-as-controller will then announce:

All aircraft on frequency, due to a National Security issue all aircraft must proceed to the nearest available airport immediately and land. Report your new destination airport and requested instrument approach procedure when able.

So another learning objective is making a quick diversion to a nearby landing—a high-workload skill that might be necessary for adverse weather or inflight emergencies as well.

Some high-time military instructors have called me a jerk when I've described these scenarios. But for the pilot who wants to build upon basic skills instead of merely repeat them again and again, this is the sort of thing that builds and expands airmanship. I present the scenarios as real-world possibilities, not as a crippling evaluation but as a positive learning experience. Every pilot I've ever presented either version tells me they enjoyed it and learned something regardless of their prior experience. It's the sort of envelope-expanding experience I crave when I seek training.

This is why I have mixed feelings when I read about the recent fatal crash of a medivac Beech King Air in New Mexico. There have been several media reports including [this one from AVWeb](#) by Amelia Walsh. Here's an excerpt:

A military GPS [jamming exercise](#) is drawing renewed attention after new reporting suggested it may have contributed to the [May accident](#) of a Beechcraft King Air in New Mexico that killed four people. The accident remains under investigation, and no official probable cause has been determined.

According to the report, the aircraft was flying from Roswell to Ruidoso when it encountered GPS interference during an electronic warfare exercise near White Sands Missile Range. The crew reportedly lost reliable satellite navigation while approaching mountainous terrain at night. Three other aircraft in the area also experienced GPS disruptions during the exercise, suggesting the interference extended beyond a single flight.

The report said the loss of GPS left the medevac crew with limited navigation capability during a critical phase of flight. The aircraft subsequently struck a mountainside, killing both pilots and two medical crewmembers aboard.

While investigators have linked the GPS outage to the sequence of events, officials have not concluded that military jamming caused the accident. The findings remain preliminary pending completion of the investigation.

The accident has also renewed concern over the increasing frequency of GPS interference. Figures cited from the Aircraft Owners and Pilots Association show reported GPS disruption events in the continental U.S. climbed from four in 2020 to 50 in 2024, with another 40 incidents recorded in 2025.

See <https://avweb.com/aviation-news/military-gps-jamming-medevac-crash/>

A pilot's, or in the case of this King Air, a crew's ability to transition away from magenta-needle GPS guidance to green-needle ground-based navigation should be a required skill. It's the sort of thing I'm a jerk about when training on the short flight from Wichita to Salina. It's what you should be working on if you're not confident and demonstrably capable of handling either no-GPS or no-radar navigation (or both).

But just as it's not too difficult to transition to partial-panel flying when an instructor slaps a cover over your instrument and tells you it's broken, yet the real-world control challenge seems to come before the pilot has identified and confirmed an actual instrument failure at night or in the clouds, so too perhaps the challenge faced by the King Air crew may have been figuring out the GPS signals were not taking them precisely where they thought they were.

Still, we can't blindly follow the magenta line (or we shouldn't). That's been a known issue in crew resource management since before the [Children of the Magenta Line](#) days. How can we detect possible loss of GPS accuracy and avoid another so regrettable outcome? Here are some ideas:

1. **Read the NOTAMs.** Don't brush off those GPS outage predictions. It's very challenging since they are often reported in term of distance and direction from some random set of longitude/latitude coordinates. These things really should be mapped out on a Sectional chart as part of the NOTAM.
2. **Use Sectionals.** I keep my iPad on Sectional chart view enroute, and frequently play "what's that town?" and "where's that airport?" as I follow the magenta line on the panel displays. I do this in part in case I need to make an emergency landing, and also simply because I'm curious about what I'm seeing out the window (in visual conditions). But it could also be a good crosscheck whether my GPS is in fact taking me over the landmarks I expect it too—high-tech-ing the old Flight Log and finger-on-the-chart method I learned way back when.
3. **Watch for RAIM loss, LPV unavailability** or other indications on the display that suggests the GPS doesn't trust itself and thinks you should not either.

See <https://carlhendrick.substack.com/p/children-of-the-magenta-line>

If the military has intentionally activated Selective Availability, would a GPS be able to detect the position it depicts is incorrect? I've found this guidance from Garmin:

During Selective Availability (SA)—the intentional degradation of GPS signals by the U.S. Department of Defense that ended in 2000—Garmin civilian GPS receivers showed distinct behavioral indication and data changes:

Position and Accuracy Indications

- **Degraded accuracy values.** The estimated position error (EPE) or accuracy radius on the satellite status page inflated from normal single-digit meters to roughly 100 meters (328 feet) horizontally.
- **Position wandering/drift.** Even when stationary, the reported position coordinates continuously wandered or jumped around a wide circle rather than holding a steady fix.
- **Sluggish or erratic speed/track.** Low-speed readings fluctuated wildly because position calculations jumped unpredictably second-to-second.

Altitude and Navigation Effects

- **Unstable elevation.** Altitude readouts suffered even larger fluctuations and vertical errors than horizontal positions, making GPS-based elevation unreliable.
- **Flawed navigation guidance.** Track lines, bearing pointers, and ETA calculations on moving maps shifted constantly to compensate for shifting position fix.

Updated to 2026, I suspect such degradation might also turn off synthetic vision.

The LESSON appears to be this: watch for unusual movement on moving maps and numerical fluctuations or obvious erroneous numbers on GPS-derived altitude, speed, distance and time readouts. When in visual conditions, continually crosscheck your planned route and current moving map position against known landmarks. In the clouds you can do this by VOR cross-bearings like we did back in the day.

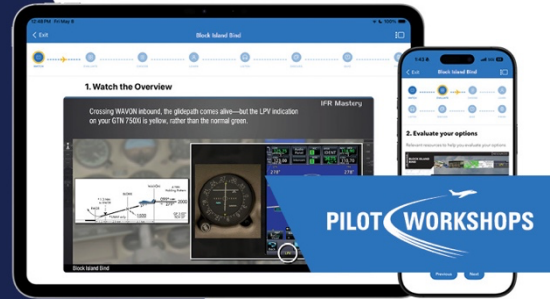
Just like detecting an instrument failure that commands a transition to backups or partial panel flight, discovering inaccuracies in GPS position and data should trigger a transition to ground-based navigation until all discrepancies are resolved and your position is undeniably known.

Questions? Comments? Supportable opinions? Let us know at mastery.flight.training@cox.net.

What would you do?

The glidepath disappears on an RNAV LPV approach. Would you continue to LNAV minimums? Test your knowledge in this IFR Mastery scenario.

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Debrief

Readers write about recent *LESSONS*:

Reader and retired Air Force and airline pilot John “Weebs” Wiebener writes about [last week's LESSONS](#) including “Train how you fly, and fly how you train”:

Tom – I don’t comment very often (mostly lurk) but I think I can add some wisdom regarding go-arounds, retractable gear airplanes, and habit patterns.

Some 23 years ago, I took a flight with George Braly [of GAMI fame] in the right seat. Everyone has all their mantras, sayings, checklists, etc. George taught me something I have never forgotten and use on every flight: “**Is this airplane ready to fly?**” for takeoff and “**Is this airplane ready to land?**” for landing. If you can answer yes to that very simple phrase – you will not have that unfortunate mishap. I am not saying to abandon any good habits you have, checklists you use, or mantras to remind yourself. Just ask that one last question: “Is this airplane ready to land?”!

Also regarding my “Gear Down” confirmations, I do it 3 times in every pattern: 1) when you leave the downwind for base turn; 2) once again when turning base to final; and 3) short final as the runway disappears under the nose. So to your article, **full agreement on a go around, when safely climbing away from the runway, to raise the gear.** I have to say in 33 years of ownership in my Bonanza, I’ve never had that “oh crap” moment.

If there is one single thing that could dramatically reduce the number of gear up landings it would be religiously **confirming gear position on final approach**—as George taught you, answering “is this airplane ready to land?” No matter what other technique you use, no matter when you prefer to extend the landing gear, whether or not you extend the landing gear before using any flaps or you use partial flaps for energy and flight path management earlier in an approach, no matter what may have distracted you on this particular approach and landing...**this final approach check, done every time, will protect you.** Thank you, John.

See <https://thomaspturner.com/flying-lessons-weekly/flying-lessons-for-august-6-2026/>

Frequent Debrief John Majane adds:

I think it is very important to retract the gear and flaps during a go around. As you said it gets you into a system that you repeat over and over again. Also the plane performs better. **Doing this all the time gives you the skills needed when something requires an involuntary go around** such as a deer or other traffic where you don't have much time to get it right.

Reader Eric Gravink continues:

I enjoyed the recent article on gear position during go-around or pattern practice. I guess I was trained correctly back in my Woodland Aviation days (early 90’s, so engrained in my head). I have always had the same thought - **don’t throw off routine.** I have felt more discombobulated leaving the gear down as it “didn’t seem right” and I was missing something.

I also look at it from a different perspective. **I will get better climb performance with the gear up and get to pattern altitude faster.** In that case, if there is an engine problem, I am already

clean and can have the best glide performance without having to fiddle with the gear (or forget it's already down).

This was unintentionally demonstrated during one of my BFRs a number of years ago. The instructor asked me to do a V_x takeoff and climb. In this case, I was so focused on hitting and holding V_x , **I neglected to retract the gear**. The instructor didn't notice either. Shortly after the takeoff, **he pulled the power for a simulated engine failure**. This was at KWVI, which has a crossing runway that should have been easy to make had the gear been up. **We were dropping like a rock and neither of us could figure out why** at first. I then looked down and noticed the gear was still down. **I advanced the power for a go-around** since we had no chance of making the runway and then said **"I think I know the problem"** and pointed to the gear selector. It was a great lesson as I think of that every time I am doing a high performance takeoff.

Yes, obtaining maximum performance may be important in some cases. And for the multiengine crowd, most piston twins do not have the capability of climbing on one engine with the gear down. With the gear down it will rapidly decelerate below single-engine minimum controllable airspeed. For that matter, it makes stalling out of an engine failure in a single-engine airplane more likely as well, in the unlikely (but not impossible) event of an engine failure. So this, too, points toward retracting the landing gear in a go-around. **Performance, normality and positive reinforcement** of normal procedures. Will save the day. Thank you, John and Eric.

Reader/instructor Brian Sagi wraps up this week's Debrief:

I too absolutely loathe "old" sayings such as "gear up landings: there are those who have, and those who will." Sayings like that take the pilot out of the command of the aircraft. After all, gear mishaps can happen to everyone and, sure enough, it happened to me! What can I do?

Absolutely not! It does not and should not have happened to you. **We are pilots and we are in command!**

One issue with gear mishaps has to do with **primacy of learning**. Most of us start our flying careers in fixed gear airplanes. When we are stressed or when dealing with even slight anomalies (e.g., non-standard instructions from ATC for s-turns or 360s; having to accommodate other traffic in an uncontrolled field, landing in wind, etc.) and **if our gear habits are not fully engrained** (gear down to come down; hear it / see it / feel it; gear before flaps; GUMPS; "in the groove/gear is green," etc.) **we revert to what we learned first** -- namely, that we don't have to worry about the gear. The result can be an embarrassing gear-up landing.

Two years ago I was at my local airport one night when I watched a beautiful Bonanza A36 taxi to the runway. The pilot asked ATC for a closed circuit to a full stop landing. I assumed he had an upcoming trip with passengers, and was practicing to regain his night currency. Shortly after takeoff, ATC advised the pilot that they were not receiving his mode C transponder. The pilot replied that he will recycle the transponder. A couple more back and forth transmissions about the transponder ensued between the pilot and ATC. A gear up landing followed, with the pilot reporting to ATC "I think I just landed on my belly." ***The pilot was so focused on trying to fix the transponder while flying the pattern that he forgot to lower the landing gear.***

I recommend teaching primary students to "raise" and "lower" their gear on every flight and even if the aircraft in which they are training has a fixed gear. Practicing gear habits right from the start serves those pilots later when they transition to retractable aircraft. Although, in a fixed gear airplane, aircraft performance does not change with the "operation" of the simulated gear, the pilot has an opportunity to ingrain all other aspects of their gear habits right from the very beginning of their flying career.

I subscribe to the idea you should ***fly the airplane you're flying***. And I think evaluating the noise, attitude change and performance effect of gear extension to be as important to gear position confirmation as are the indicator lights. But your technique may be wise tactic for teaching pilots you know will be moving into retractable gear airplanes. Some aircraft manufacturers agree and have included "practice" gear switches and lights in fixed-gear trainers including the Piper

Cherokee, the Beech Musketeer and (I've heard) even the Cirrus SR20 for use in training academies for future airline pilots. Thank you, Brian.

More to say? Let us learn from you, at mastery.flight.training@cox.net.

A banner for the National Association of Flight Instructors (NAFI). On the left, the NAFI logo is displayed in white on a blue background. To its right, the text reads: "JOIN THE NAFI COMMUNITY" in yellow, followed by "Become a member today and join 1,000s of others like you who are dedicated to aviation safety and training. NAFI members receive exclusive membership benefits." and "More information: nafimmentor.org". A red button with a white arrow and the text "JOIN NOW" is positioned below this text. On the right side of the banner, there is a laptop displaying the NAFI website, which includes a "Welcome to NAFI" message and a login form.

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NEW THIS WEEK: Lauren McGavran, David Clark



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