



FLYING LESSONS for May 29, 2014

suggested by this week's aircraft mishap reports

FLYING LESSONS uses the past week's mishap reports to consider what *might* have contributed to accidents, so you can make better decisions if you face similar circumstances. In almost all cases design characteristics of a specific make and model airplane have little direct bearing on the possible causes of aircraft accidents, so apply these *FLYING LESSONS* to any 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:

"It was a two-year [Required] Flight Review." So began the narrative sent me by a *FLYING LESSONS* reader. He was addressing the gear-up landing of an early 1960s Beechcraft Bonanza that occurred near the reader's home airfield this week. The reader had learned from the pilot what had happened in the final moments of the mishap flight.

"The instructor was coaching the pilot to improve his landing technique. The instructor was saying something like 'keep the gear up' in an attempt to teach the pilot to flare. The pilot mis-interpreted what he was saying and raised the [landing] gear as the Bonanza was at the touchdown point."

The airplane impacted the runway smoothly. "The flaps were not damaged, the tip tanks do not appear to be damaged, [and] the main gear doors are not damaged." The reader thinks this airplane will be repaired—which is not the norm for airplanes of that vintage following a Landing Gear-Related Mishap. Hopefully the reader's information is correct.

This event reminds us that there is great power in words, and that communication is key to effective and safe flight instruction. Had the Certificated Flight Instructor (CFI) used standard terms—"raise the nose," "increase the pitch attitude," etc., it's far less likely the Pilot Receiving Instruction (PRI) would have misunderstood the instructor's directions. Standard phraseology is "standard" for a reason...this being a very obvious example.

The PRI, however, plainly shares fault for raising the landing gear during the flare. Even in a balked landing (a "go-around") the gear should not be raised until power is applied, the proper pitch attitude established and a positive rate of climb confirmed.

That the pilot raised the landing gear even while continuing to flare and touch down suggests what may really have been going on was a condition I call *Instructor-Induced Stupidity*.

I credit a student of mine with coining the phrase "instructor-induced stupidity" to describe the tendency of a flight student to defer decision-making or responding to aircraft indications when there's an instructor on board. From the student's standpoint it's easy to think, "My instructor will take care of me," or that the CFI has somehow manipulated aircraft indications to meet a training objective, or maneuvered the student into a decision-making position as part of the instructional process. *Stupidity* may be too strong a word, but I think it somewhat humorously describes deference to a flight instructor to the point it becomes abdication of Pilot-in-Command responsibility.

As my student noted, it's easy for the Pilot Receiving Instruction in such cases to mentally sit back to see what might happen next. The potential is even more pronounced if the CFI has a lot more experience than the student (an airline captain, for instance) or if the instructor is considered an "expert" in the type. After all, the CFI is usually logging time as pilot-in-command regardless of the student's qualifications—surely he or she would not let anything bad happen.

The CFI absolutely must be vigilant to the safety of the instructional mission—more on that shortly. But the Pilot Receiving Instruction should act as if he is alone in the cockpit and respond

to situations and indications just in case the instructor communicates ineffectively, or is distracted at exactly the wrong moment.

The PRI must be aware that he/she has definite responsibilities for the safe outcome of the flight, just as does the CFI. *No one is perfect*, so abdicating responsibility to the person in the right seat can't be the right thing to do.

If Instructor-Induced Stupidity is the "instructional hazard" generated by the PRI, the CFI's biggest hazard is *instructor complacency*.

It's easy after the third or fourth student of the day, or the fifth or sixth trip round the traffic pattern with the same PRI, or with a student you've flown with several times, for the instructor to become complacent. A high-time pilot or a PRI who has flown the same airplane for a very long time can also make a CFI feel as if he/she is just going through the motions when conducting a Flight Review or other recurrent training.

It's a nasty wake-up call for the CFI when a student does something unexpected, or for the instructor's mind to wander. Just because the student has a lot of time in the airplane, has professional credentials (in and outside aviation), or possesses a strong personality does not mean that the instructor can be any less vigilant.

A measure of a good instructor is the ability to remain focused on the task under way, as well as see-and-avoid and other aspects of being the flight's designated safety officer. The instructor who detects him/herself daydreaming or missing radio calls and checklist steps should immediately terminate the instructional flight unless he/she can return concentration and discipline to the moment.

I've learned that focusing on standard operating procedures and remembering I'm ultimately responsible for the safe outcome of the flight is the best defense against instructor complacency. I acknowledge that Instructor-Induced Stupidity and Instructor Complacency are real hazards of flight instruction, so much so that I include this in my briefing of pilots before instructional flights:

The very nature of flight instruction is that I will be putting you in situations that are unusual and may be new to you. You will be acting as pilot-in-command. Fly the airplane as if you are solo in the aircraft—don't pause to think "I wonder what Tom is doing to me", or "That's a good trick, how did he get the airplane to do that?", or "I wonder if Tom wants me to miss this approach?" If you see an unusual situation, or feel you need to go around or miss and approach, go ahead and do so—**you won't be wrong**. We may talk about what you did and why you did it in debriefing, but always err on the side of caution and never second-guess what you see and feel just because I'm in the airplane with you.

Similarly, my primary purpose is to assure the safe outcome of our flight. I will of course be teaching and coaching you, and I will be watching you to prevent any action that might negatively affect the safety of our flight. If necessary I'll speak up, prevent your improper action, or take over the flight controls if needed—in that order—to assure our safety.

What I do by providing this briefing is to get us *both* thinking about the potential side-effects of dual flight instruction, and our roles and responsibilities in assuring the success of our training flight. This level of awareness should prevent the poor communication, the abdication of Pilot-in-Command responsibility that results from Instructor-Induced Stupidity, and instructor complacency that prevents the CFI from assuring an accident-free learning experience.

Summing it up, when receiving instruction (no matter who is doing the instructing), fly the airplane as closely to normal as possible. There's no situation when you should violate any Standard Operating Procedure, like raising the landing gear on short final without first beginning a missed approach or go-around, and then only after adding go-around power, establishing the climb pitch attitude and confirming a positive rate of climb. So don't allow

yourself to do so when an instructor is at your side, even if you *think* the CFI has told you to do so.

Put another way, although the CFI is ultimately responsible for the outcome of a training flight, you are still the pilot in command (even if your currency prevents you from logging it as such).

Similarly, when providing instruction, use clear, standard phraseology, and *anticipate when a student may act impulsively, improperly or incompletely* in a manner that puts the successful outcome of the maneuver seriously in doubt. Regardless of the PRI's experience or your familiarity with him or her in the cockpit, expect the unique stresses of flight instruction to challenge the PRI to do something wrong...and keep your eyes and hands where they can detect and prevent a bad result. That's the real challenge of flight instruction.

Comments? Questions? Suggestions? Email Mastery.flight.training@cox.net.



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Debrief: Readers write about recent *FLYING LESSONS*:

Tom Allen, the *FLYING LESSONS* reader who began a discussion about noise-canceling headsets and an apparent engine roughness sound at power settings other than cruise flight, writes about Debriefing responses from other readers:

Glad to hear that my one experience wasn't so unusual. Glad [also] to see some feedback on ANR headsets. The question for the guy who heard it is, did you feel it as well? Was the sputtering regular and rhythmic? The take away is, if you hear a sound, turn off ANR and/or remove your headset to see if you still hear it.

And reader David Horvath reminds us there's a larger issue to consider:

One comment about ANR headset artifacts sounding like engine roughness -- **if you think you hear engine roughness, treat the situation as if the engine really is misbehaving.** I fly with a traditional (non-ANR) headset. I had a flight where then engine became rough below 2000 RPM (noticed on descent). If I had not paid attention to the situation, explored the symptoms, and flew the pattern at a higher-than-normal RPM, then I would not have been prepared for the engine to quit when reducing throttle on final -- only really noticed when the propeller stopped spinning five feet above the runway. To keep this response short, I did follow the emergency checklist when first noticing the problem -- including mixture, electric fuel pump, carb heat, etc. I did not switch fuel tanks since I was fine above 2000 RPM. The mechanic thinks it was a float valve stuck open.

Superb and critical point, David, and one I overlooked—if the engine sounds rough, then troubleshoot, land and check it out right away. The first step of troubleshooting might be to turn off a noise-canceling headset to hear the engine better. You might even take your headset off for a moment to better evaluate the engine.

Don't hesitate to act because you *think* you know what's going on, or the roughness goes away but you don't know precisely why, or because you *believe* the roughness isn't bad enough to be a problem. Engines rarely fail without providing some kind of warning. Listen to what your engine is trying to tell you.

In [last week's LESSONS](#) I mentioned some activities where pilots attempt to fly airplanes for purposes for which the airplane is not designed:

“Fly the ‘plane you’re flying.” All too often problems occur when a pilot attempts to make an airplane perform in a way for which it is not designed.

Pilots overload airplanes beyond their weight and balance limits because they can fit a little more into the cabin or the fuel tanks, or because they don't take the time to compute the airplane's condition. Some pilots attempt aerobatics in airplanes not certified for the stresses; others fly airplanes unequipped or barely equipped for icing conditions into ice because “I live in a cold climate; we'd have to avoid flying several months a year if we are afraid to pick up some ice.”

I know pilots who fly very close formation in airplanes with very limited visibility, trusting another not-professionally-trained-for-formation pilot to stay in position in what for him or her is a blind spot. Others try to fly airplanes with five hours' range on five-and-a-half-hour flights, or into thunderstorms because they're on a schedule to make it somewhere on the far side of the storms and they don't have the capability to fly over or around them.

Fly the ‘plane you’re flying means flying it for the purpose for which it was intended. Don't fly it like the airplane you wish it to be. This means reading the airplane's Limitations, and flying within the limit set on it by design, regulation and “plane” good sense. If there's something else you want to do with an airplane, find a different airplane that's suited for the task.

Just as importantly, it means flying within the bounds of your pilot certificates, ratings, experience and recency, and not compromising any of the airplane's limitations or your own because of a sense of “mission” that doesn't truly apply to your flight.

One item I mentioned is formation flying in airplanes with severely restricted vision in directions where other airplanes—flown by other recreational formation pilots—will be flying very close by. Probably in response to this statement, a reader whom I'll keep anonymous asked me this question:

Do you have any numbers on the frequency of incidents while performing formation flight with a leader who is not professionally trained? I have a sincere interest in the actual risk of formation flight vs. more conventional flight if it has been quantified.

I replied: Since formation flight outside of wavered airspace during air shows does not require Federal permission nor reporting, there is no record if the number of formations flights done each year. Without having done any specific research, it's not unusual to read of two or three midair collisions during recreational formation flying each year. The pros do it too--every now and then there is a formation collision between military aircraft.

I'm not formation trained, although I've ridden along on a mass arrival into Oshkosh once, as well as in a few local formation flights. I've also sat in on a number of mass arrival formation briefings. From that experience I feel that, done correctly and with expert-level training and briefings, flying formation is no riskier than, say, flying an ILS approach in weather right at minimums. My personal issue is not with formation flying per se, but with formation pilots who feel "the show must go on" and fly formation in strong, gusty wind conditions (which GA pilots seem to have enough trouble handling without another airplane or two within a few feet of the wingtips); with flying airplanes with limited visibility (usually out the right side) where another amateur formation pilot is very close by; and with pilots who attempt the task of formation flight without willingness to put the serious time and discipline into it that the demanding skill requires.

Midair collision is not the only hazard. As an example I cited [this NTSB report](#) as illustration of the worst possible scenario, when two pilots erroneously abdicated their Pilot-in-Command responsibility to a formation lead pilot and flew into terrain, and a third escaped with his life (and those of his passengers) by breaking formation when he detected the hazard.

See:

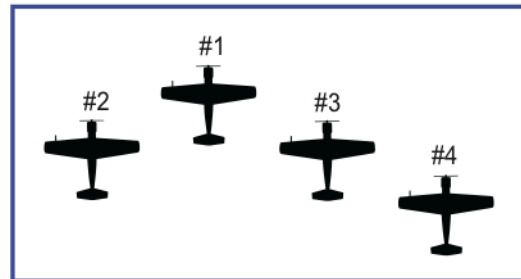
www.mastery-flight-training.com/20140522flying-lessons.pdf
www.nts.gov/aviationquery/brief.aspx?ev_id=20020712X01100&key=1

The reader replied:

I remember the [report]. I also remember your comments about [past years' formation] landings [in crosswinds at Oshkosh]. I think I am trying to convince myself that formation flying is not a good idea for me. The pros for continuing are the camaraderie and the challenge to improve my skills.

To which I responded: There's no question formation flying is a great social activity and a good skills-builder. Again, I'm not a trained formation pilot. As an outside observer, I suggest you might consider these mitigations:

- Always be a wingman, not an element lead. It gives you more room for evasive action—you're not stuck between two other airplanes (realizing UP and DOWN are collision avoidance paths for an element lead pilot).
- Take the right wing position (#3, or in a four-ship formation, #4). This gives you a runway to yourself on landing if you land in a three-ship on 36 at Oshkosh, which is usually the case (element lead and the left wing land on 36L, the right wing breaks off and lands singly on 36R).
- The right wing position also keeps the two or three closest collision threats on your side of the airplane where you can see them, not in the blind spot behind your airplane's right wing (blind from your position seated in the cockpit).
- Just as in instrument flight, *scan*, don't fixate. Hold position, but scan forward and to the right to maintain situational awareness. You need to retain personal responsibility for traffic and obstacle avoidance. Be the guy that escaped flying into the canyon wall in the NTSB report, not one of the two pilots who flew their airplanes and trusting passengers into the mountain.
- To facilitate the ability to scan, fly a little looser formation than the tightest you feel comfortable doing.
- Determine your own crosswind/ tailwind takeoff and landing limitations as they exist at the time of your formation flight. Do not violate them under the peer pressure of the group. Opt out if conditions are beyond your limits--don't take off with the formation or, if conditions change while you're en route, break formation and proceed alone.
- Always fly formation with a formation-briefed safety pilot in the right seat.



Not popular, perhaps, and obviously not everyone can take the right wing position. Formation flying is an exacting and demanding skill, not to be undertaken without serious training, recency and study, as evidenced by [this very detailed manual](#) that is the “gold standard” for civilian formation flight. *Since I was asked*, just as I observe personal limitations on instrument flight and crosswind conditions, if I was to engage in recreational formation flight this—and a *lot* of briefing and training—is how I'd personally mitigate the added risks of operating in close proximity to other airplanes.

See www.flyfast.org/sites/all/docs/FAST_FKG.pdf

You might disagree, and that's OK. If you read carefully, you'll see what I'm saying is that you can accept this added risk—just as I accept and mitigate the risks of single-pilot IFR flight in single-engine airplanes, for instance, something many professional pilots consider to be extremely risky—by **considering beforehand the very real hazards**, and **doing what you can to reduce your risk exposure as much as possible** while enjoying the freedom to operate your airplane within its limitations, and your own. **Don't forget your responsibility to passengers who trust your judgment, too.**

Occasionally we should *all* take such a critical look at all the types of flying we do, and see if there are ways we can accomplish our flying goals with reduced hazard and risk. As I ended my exchange with this reader, “have fun.” That's what it's all about.

Reader John Kolmos also writes about last week's *LESSON* on "fly the 'plane you're flying:"

Your *LESSON* made me chuckle a little. Today I love checking out jet jockeys in Cessna 172s, 182s etc...especially when we get real slow on short final, you can see them squirm. However, my first experience caught me by surprise. I was a pretty new flight instructor some 15 years ago or so when I was asked to check out a pilot who wanted to also be a flight instructor on a part time basis. Come to find out he retired from one of the majors, think it was United or maybe Delta as a 747 captain and instructor pilot (you know where this is going to go). So I said sure, piece of cake. Asked him if he has any recent time in a small single-engine [airplanes] and he admitted it has been years since he did, but would like to stay active and be a part time instructor.

So out we went, and he did beautiful with everything from radio work, navs, steep turns, stalls and slow flight. I then started to relax figuring this guy got it nailed. We went back for some touch and goes, he got into the pattern, great down wind, base, final...I'm looking out the side window when from a slight nose low, the nose starts to rise up through the horizon and I see tops of trees! I immediately push the nose down as the stall horn starts and spit out an expletive and said more or less...are you "crazy"! He started flaring when we were up 50-75 feet in the air! He got so into the flying that his procedural memory started to flare when he started to pick up the visual cues he had been used to all those other years flying 747s.

So I learned two things: One is never trust and get comfortable with a student or person checking out even if they have a 40,000 hours and flew the Space Shuttle. Two, know your airplane! It may be very different from the Concorde you were flying.

The high-cabin cockpit flare of the air transport pilot is another scenario I've also seen when providing transition training. Thanks, John. Reader Robert Thorson continues the thread:

Your weekly message is good but before you explained it I was biting my tongue! There was a little one-upsmanship on the part of the airline simulator guys and yourself and that truly disturbs me because I have seen so much of it over the years. The point being to show the maneuver correctly to the pilot in the left seat first...primacy. Don't let him try it "on for size". If you did that with an Asian student you would cause him to "lose face", because of his poor performance, and he would probably quit flying. Much like a student pilot not knowing risk, because he has no experience, transition training puts everyone back to block one in aviation. No one knows what is correct until they are shown.

Perhaps true. I prefer to talk the pilot through a maneuver—assuming I'm working with a rated pilot, not one brand new to flying with no frame of reference with which to act. I also demonstrate a maneuver the first time when we're doing something that's new to a certificated pilot, for example, a chandelle for the pilot just beginning work toward his or her Commercial checkride. If the pilot cannot fly the task or maneuver successfully then I will demonstrate if necessary before again coaching the pilot through the maneuver.

I've trained a number of international pilots, I believe successfully, and in a manner that gives them the confidence they need—I certainly do not intend "one-upsmanship." I would be horrified if I've ever left a student with the feeling I'm saying "I can fly the airplane better than you are capable of doing yourself."

Here's an opportunity for me to learn something that may make me a more effective instructor. Please take a moment to answer this quick poll: When receiving flight instruction, do you prefer to have the instructor demonstrate a maneuver the first time you see it in flight, or for the instructor to guide you through flying the maneuver yourself without a demonstration beforehand? [Answer this quick, one-question survey here.](#)

See <https://www.surveymonkey.com/s/G5VF9HB>.

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Thank you, generous supporters

No, I didn't write them all this month. But through a confluence of editorial deadlines, I have published a total of nine articles that will appear in the June 2014 issues of major aviation periodicals. If you're interested, here's a list of [June 2014 articles by Thomas P. Turner](#).

See www.mastery-flight-training.com/this_months_articles.html.

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2010 National FAA Safety Team Representative of the Year
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