

FLYING LESSONS for May 17, 2012

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:

"Watch this!" A demonstration flight by definition is an opportunity to show the airplane's capabilities...and to do things pilots don't normally do with the aircraft.

Aviation lore is filled with unusual events performed on demonstration flights—probably the most celebrated is Tex Johnson's [barrel roll of the prototype Boeing 707](#), a "classic" stunt that may have sold airplanes, but as far as we know was not authorized, and more importantly, the outcome was uncertain until the maneuver was complete. It was a well-executed maneuver on the *hope* it would turn out OK. Luckily, it did.

See www.youtube.com/watch?v=Ra_khhzuFIE

At other times the demo turns deadly. A thrill ride killed 50 last week, apparently to provide an unusual view (from an airliner) of mountainous terrain rushing past just below the aircraft. Unfortunately the airplane was aimed at rising terrain in cloudy conditions, and impacted terrain. The working assumption to date seems to be Controlled Flight into Terrain.

Taking people for a ride? Show them how your airplane is *supposed* to be flown. Show normal or maximum performance takeoffs and climbs, a representative normal use of the airplane in cruise at a safe and legal altitude, and a typical or maximum performance landing...but all within the limitations of the airplane and the legalities of normal flight. Demonstrate why the airplane is a good fit for your flying mission—by showing a sample of how it is normally flown.

Maximum braking is almost never called for on landing. Heavy application of brakes can cause brake overheat, locking up or failure. What's worse, since brakes are completely independent on each main wheel (or truck), failure of a brake may occur on one side when full braking is still being applied on the other. Asymmetric braking on this level makes running out-of-control off the runway extremely likely.

An early instructor of mine taught me that "airplane brakes are designed to slow the airplane, not stop it." What he meant was that we should touch down at the slowest safe speed for conditions, so the airplane will roll to a stop on the remaining available runway. Only when the aircraft is at near normal taxi speed should we apply any brakes, to slow down to make a turn-off.

In practice we sometimes need to use brakes on the landing roll. When we do, however, we need to apply them as sparingly as possible, and in short bursts to avoid overheat or failure. Even then, we need to be prepared for an asymmetric brake failure, ready to do what's needed to keep the airplane on the runway.

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



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Debrief: Readers write about recent *FLYING LESSONS*:

SBT or START?

In the [April 26 *FLYING LESSONS*](#) I linked to an article by Rod Machado (a *FLYING LESSONS* reader) from the April 2012 issue of [AOPA Pilot Magazine](#). [Rod writes](#) in defense of basic stick-and-rudder training (what I call START), and the need to delay introduction of advanced decision-making scenarios and Scenario-Based Training (SBT) until after the student has mastered the basics of flying the airplane. Reader Geoff Murray chimes in:

Here are my thoughts based on Rod's article: I'm an old-school type of instructor who strongly believes in stick-and-rudder training, and I emphasize such to my students. In fact, my students complete an entire pre-solo written exam before embarking on any serious in-aircraft flight training. Why? So that we can just **focus on flying the plane**, rather than learning about flight. My first serious lesson typically lasts three hours and includes a thorough pre-flight, radio practice, multiple engine starts and shut-downs and at least three high-speed taxis, such that the student simply gets a sense for maneuvering the airplane on the ground. After that, we focus on climbs and descents, turns, slow flight, accelerating, decelerating and flight instruments, with an overall emphasis on situational awareness and smooth application of the controls. This is basic stick-and-rudder flying, and *then* we turn our attention towards pattern work and take-offs and landings.

As Rod mentioned, laying this foundation yields huge benefits later in training, when the student can focus on a few selected new tasks rather than a myriad of new tasks. I also believe such a program mitigates training defections, many of which are created when the student is simply overwhelmed with new material and becomes discouraged.

But the real building block is simply stick-and-rudder skills. That means lots of time in the practice area and pattern, not shooting approaches that we can't even land from!

Thank you, Geoff. I think any good instructor puts things into context with their student. For instance, I include practice trimming the airplane in any first lesson—from straight-and-level flight, with the airplane trimmed, I take the controls, place the airplane slightly out of trim by moving the trim wheel, and then have the student re-take the controls. The objective is for the student to learn what "in trim" and "out of trim" feel like, how to trim the airplane, and how much easier it is to fly with the airplane in trim. That's the scenario. I don't have to go the full SBT route of concocting a reason for a flight ("You're flying to Kansas City to visit your sister's new baby") and then an in-flight issue ("Your rear-seat passenger is getting a little airsick and you suggest he move up to the vacant co-pilot's seat") and a required action ("You notice this changes the feel of the airplane and you have to add back pressure on the control yoke to hold altitude. What else do you need to do?"). No, I just have them trim the airplane a few times and then will emphasize retrimming the airplane with any power or configuration change from then on.

One aspect of SBT I do like, and I think is not emphasized enough in training, is pilot evaluation of weather conditions. Not getting a weather briefing—that's important, too, but not the whole story. At the beginning of training I'll explain the difference between VMC (visual meteorological conditions), Marginal VFR, IMC (instrument meteorological conditions) and Low IFR. I'll note the type of weather in which the Pilot Receiving Instruction (PRI) is qualified to fly, and at the beginning of each flight *ask the PRI to tell me what "category" of weather exists, and have the PRI make a decision on whether it's OK to fly*. I started this very long ago, as a new instructor, when one of my students called before a flight asking if it was too cloudy to fly. There was a perhaps 8000-foot overcast that day, with superb visibility below, but my student didn't have any context in which to decide whether the cloudy skies would permit or should cancel his session. In my aero-youth I lost this opportunity and simply told the student it was good enough to fly, instead of explaining *why* conditions were good enough, or involving the student in any way in the decision.

Now, I let me PRIs brief me on the weather, and their decision on whether or not to fly. I also ask them to evaluate the category of weather at times while en route...because a go/no-decision made before takeoff often needs to be re-evaluated once in the air. Certainly I'll add to the discussion at times. Eventually I'll include my [Categorical Outlook Go/No-Go Decision Matrix](#). But the pilot needs to judge for him/herself whether the conditions are safe and legal. The accident record shows that we instructors aren't doing a very good job of teaching that particular skill.

Later, after a pilot has learned the START basics, sure we'll include more SBT in our training. And I like to use SBT concepts in recurrent training with very proficient pilots, to hone decision-making as well as START skills. But you can't play a piano concerto without practicing a lot of scales. So it is with SBT and START.

See:

www.mastery-flight-training.com/20120426flying_lessons.pdf

www.aopa.org

www.aopa.org/members/files/pilot/issue_index.html

www.thomaspturner.net/Categorical%20outlook%20matrix.htm

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Thomas P. Turner, M.S. Aviation Safety, MCFI
2010 National FAA Safety Team Representative of the Year
2008 FAA Central Region CFI of the Year



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