

# FLYING LESSONS for July 9, 2009

suggested by this week's aircraft mishap reports

FLYING LESSONS uses the past week's mishap reports as the jumping-off point 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.

FLYING LESSONS is an independent product of MASTERY FLIGHT TRAINING, INC. [www.thomaspturner.net](http://www.thomaspturner.net)

## This week's lessons:

**A frequent high density altitude scenario** is to lift off into ground effect but then settle back onto the runway because of wind variations, varied thermal activity, trying to force the airplane to climb out of ground effect at too low a speed, excessive drag caused by over-rotation, or the added drag created by retractable-gear doors and openings in the gear retraction process.

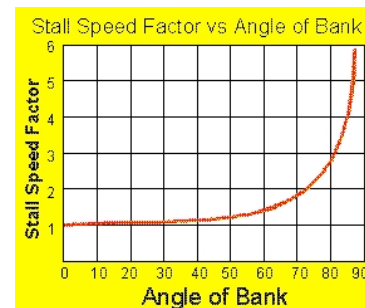
**It's not uncommon** to see one of these "settled back onto the pavement" mishaps reported as a landing gear collapse if an RG pilot has selected gear UP before settling and the gear folds on impact.

**On all takeoffs**, but especially under windy or high density altitude conditions, ensure you have the proper climb attitude and a consistent positive rate of climb before making any configuration changes. If you're flying an RG airplane, confirm "positive rate" and well clear of the runway before selecting gear UP.

**We've seen before** why [you should not depend on landing gear squat switches to prevent retraction](#). Be careful to avoid gear handle movement until you're ready for the gear to move.

See [www.thomaspturner.net/Squat%20Switches%20and%20Gear%20Collapse%20Mishaps.pdf](http://www.thomaspturner.net/Squat%20Switches%20and%20Gear%20Collapse%20Mishaps.pdf)

**Avoid banking too steeply** in the traffic pattern. We all learned this early on, but we may have been taught this rule for the wrong reason. Sure, stall speed increases with an increase in G-load, and increased bank increases g-loading, but the increase in load is not terribly significant until you get steeper than about 60° of bank, and more importantly, the increase in g-loading only occurs **if the airplane is in level flight**. Descend while banking, which is almost always the case on base leg and the turn onto final approach, and the g-forces do not build up—in most cases, increased bank angle in the traffic pattern alone does not increase the stalling speed of the aircraft.



**Cross-controlled flight**, with the rudder significantly uncoordinated to bank, increases the drag on one side of the airframe relative to the other and is a contributor to traffic-pattern stalls not because of g-loading, but because of asymmetric wing angles of attack. A radical bank to try to align with the runway is often accompanied by unintended uncoordinated flight, so part of why we're taught to keep the bank shallow is to prevent or at least mitigate the effects of going uncoordinated.

**What does happen, then**, if we bank too steeply in the pattern, but keep descending with the inclinometer ball in the center? Try this experiment:

- In clear skies (and with an instructor familiar with your airplane type, preferably), climb to a safe altitude.
- Slow to a maneuvering speed safe for the airplane's current weight.
- Clear the area for traffic.
- Once you're sure it's clear beside and below, put the airplane into a 35° or so bank.
- Let go of the controls.

A stable airplane's nose will drop with the reduction in lift. As the pitch drops the bank may begin to increase also. Airspeed will begin to build; most notably, vertical speed will increase extremely rapidly. Note how quickly the rate of descent builds if you bank too steeply and do not manually resist the airplane's tendencies.

**You've entered an incipient spiral.** Before speed gets too far into the yellow, smoothly (and with rudder coordination) level the wings. The nose will pitch up, trying to regain its pre-test trimmed airspeed. The faster you get before recovering, the more dramatic the pitch-up; you may need to push forward on the controls to avoid pitching up into excessive g-forces and/or an incipient stall (this is where the instructor's help comes in).

**Consider the scenario** where you are close to the ground, tight in the pattern, and you bank excessively to try to line up with final approach. Even if you keep the ball in the center, if you are distracted and don't pull against the airplane's spiraling tendency the vertical speed may build very rapidly. With little room to recover (turning final at 400-600 feet AGL) you can see where excessive bank can be a contributor to terrain impact off the end of the runway, even if the pilot coordinates the controls. I think a lot of what is ruled to be a "stall/spin" on final approach may be in fact an incipient spiral that results in altitude loss before the pilot can recover. The result is the same, but now you know more of why you should keep bank shallow in the traffic pattern, even if you a rudder-coordination master.

Questions? Comments? Email me at [mastery.flight.training@cox.net](mailto:mastery.flight.training@cox.net)

## QUESTION OF THE WEEK

### July Question of the Week #1

Nobody responded to the Question of the Week last time, so we'll leave it open for your responses again this week:

- **Have you had a density altitude learning experience? What happened, and what did you learn?** Copy and paste the question with your response to [MFTsurvey@cox.net](mailto:MFTsurvey@cox.net).

One randomly selected reader in July will win his/her choice of a **Mastery Flight Training hat** or the MFT DVD **Those Who Won't: 10 Tips for Avoiding Landing Gear Mishaps**. Your email address goes in the drawing once every week you respond to a question. All responses will remain confidential, but I will publish a review of the results. Like PIREPs, this works best if *everyone* participates. So take a moment to answer this week's question... then come back to read the rest of *FLYING LESSONS*.

**And we have a winner!** *FLYING LESSONS* reader David Kenny was selected from among June Question of the Week responders to receive his choice of a Mastery Flight Training hat or a copy of the MFT DVD [Those Who Won't: Avoiding Landing Gear-Related Mishaps](#). David writes:



Thank you, Tom! Since I fly a retractable (and already have plenty of hats), it's an easy choice. I'll look forward to augmenting the safeguards I count on to get the round, black parts down in time. By the way, I've really enjoyed the Questions of the Week. You get an interesting and informative mix from the experience of your readers.

David manages the aircraft accident database for the [AOPA Air Safety Foundation](#), so is part of the team directly responsible for the ASF's annual *Nall Report* and copious other products that

help us learn from the experience of others. Congratulations, David! Thanks for your inputs to *FLYING LESSONS*, and all the great work you do for AOPA.

See

<https://secure5.webfirst.com/ABS/Store/#ThoseWhoWont>  
[www.aopa.org/asf](http://www.aopa.org/asf)

## OSHKOSH!

Flying to the Experimental Aircraft Association's [AirVenture](#) at Oshkosh? Consider these Flying to Oshkosh-series articles to help you prepare for your big arrival:

- [See Spot, Land](#)
- [Four Eyes are Better than Two](#)
- [Wind-ing Your Way to Landing](#)

See:

[www.airventure.org/](http://www.airventure.org/)  
[www.aero-news.net/news/featurestories.cfm?ContentBlockID=707D7B2B-8F23-477C-B509-82922D0727E9&Dynamic=1](http://www.aero-news.net/news/featurestories.cfm?ContentBlockID=707D7B2B-8F23-477C-B509-82922D0727E9&Dynamic=1)  
[www.aero-news.net/news/featurestories.cfm?ContentBlockID=232F926C-88EE-450D-B5B1-098AB96F0F74&Dynamic=1](http://www.aero-news.net/news/featurestories.cfm?ContentBlockID=232F926C-88EE-450D-B5B1-098AB96F0F74&Dynamic=1)  
[www.aero-news.net/news/featurestories.cfm?ContentBlockID=439EFF1E-2A8F-4F12-A1FD-13EF01B27318&Dynamic=1](http://www.aero-news.net/news/featurestories.cfm?ContentBlockID=439EFF1E-2A8F-4F12-A1FD-13EF01B27318&Dynamic=1)

### **Mastery Flight Training seminars at Oshkosh**

Please join me and your fellow *FLYING LESSONS* readers for:

- *Keep it on the Runway: Mastering Directional Control* Wed., 7/29 at 2:30 pm in EAA Forum Pavilion 4.
- *The First 60 Seconds: Performance in Transition* Sat., 8/1 at 1 pm in EAA Forum Pavilion 4

See you at Oshkosh!

## DEBRIEF

Concerning last week's *FLYING LESSON* on runway temperature, readers write:

Outstanding issue...I had not even thought about the runway temp being hot enough to increase density altitude makes perfect sense...especially when I take off from an airport in New Mexico at a field elevation of 4,011 situated on a desert floor. I really like the question of the month and comments and stories coming back. Kind of like "Never Again" in AOPA's magazine.—Bill Caton

I suspect you're tired of getting so many comments from me but your reminding pilots of the concept of "runway temperature" is fantastic. I suspect not 5% of GA pilots have ever even thought about that.—Jim Lauerman, president, AVEMCO

Thank you both!

Questions? Comments? Send your insights to [mastery.flight.training@cox.net](mailto:mastery.flight.training@cox.net)

***Fly safe, and have fun!***

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



*FLYING LESSONS* is ©2009 Mastery Flight Training, Inc. Copyright holder provides permission for *FLYING LESSONS* to be posted on FAASafety.gov. For more information see [www.thomaspturner.net](http://www.thomaspturner.net), or contact [mastery.flight.training@cox.net](mailto:mastery.flight.training@cox.net) or your FAASafety representative.