

FLYING LESSONS for January 26, 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 many 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. However, verify all technical information before applying it to your aircraft or operation, with manufacturers' data and recommendations taking precedence. You are the pilot-in-command, and are ultimately responsible for the decisions you make.

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This week's lessons:

The alarm sounded continuously for a full 51 seconds before the Socata Trinidad landed gear up on a pretty mountain airstrip. In [this video](#), taken from by a rear-seat passenger, the pilot and at least two passengers are descending into a picturesque paved field nestled between lush green hills. The steep terrain perhaps contributed to the pilot's decision to approach the field high and pull the power to idle (engine noise gets very quiet, especially on short final) to accommodate the high-angle descent.

See www.youtube.com/watch?v=sD13LmYRQ4s

Despite the reduced engine noise, however, the pilot does not appear to notice the high-pitched scream of the landing gear warning horn, which comes on and stays on for almost a full minute before impact. Like most retractable gear airplanes, the Gear Unsafe warning blares if the throttle is reduced to near idle power while the gear is down but the landing gear struts are not compressed (as they are under the airplane's weight on the ground).

He may have begun his approach knowing he would have to pull the power way back to make his steep descent. He may have been focused on the descent angle, expecting to need near-idle power to achieve his goal.

Still, he should have been able to detect a discrepancy between the power setting, the pitch attitude, the airspeed and the rate of descent...if the gear had been down he should have been descending much more steeply than he was.

Seven seconds before "tying the world's low altitude flying record" the stall warning began to sound as well, a slightly different tone, blaring intermittently (as opposed to the steady gear warning). The pilot does not appear to adjust attitude or power in response to this warning, either, although he may have been purposely planning a minimum-speed touchdown, knowing that most stall warnings sound five to seven knots above the stall speed (more correctly, a few degrees before reaching the critical angle of attack).

After the Socata slides to a stop and the pilot overcomes the typical period of denial before choosing to act, he begins to exit...still not having turned off the electrical system. As he deplanes a very bright red light, perhaps a Gear Unsafe annunciator (I've not been able to confirm this online—any TB20 or -21 pilots out there?) is visible just to the left of the attitude indicator, clearly in the pilot's line of sight. If this is indeed a gear warning light, the pilot missed it as well.

We've seen Internet video like this before, and we'll likely see it again. The scenario is not limited to Landing Gear-Related Mishaps (LGRMs). I've seen it time and again as a simulator instructor, when I put the pilot in a fairly simple scenario then "failed" the airplane's alternator. In the type of airplanes I taught in "the sim," this triggers a flashing, red light almost directly at eye level, on the lip of the glareshield in front of the attitude instrument. Yet, on average, pilots took over two minutes to notice the flashing red light, then confirm a loss of electrical power with the electrical gauges.

We called it "task saturation" in the U.S. Air Force, the very real mental state of selective receipt of stimuli, or even complete mental shutdown, when presented with too much information

at one time. Have you ever found yourself with so much to do you can't get anything done at all? Under slightly less stress your brain copes by admitting and processing only that information that confirms your world view or desired outcome...you only see what you want to see, and hear what you want to hear. Disparate information—landing gear warning horns, for instance—don't even register in your brain as it seeks to make sense of a nonsensical world.

We all know a little stress is a good motivator...but too much stress makes us completely ineffective. The stress tipping point is different for different people (you may be able to handle more stress than me), and will vary with our fatigue state, our health, and even our motivation to achieve our goal—the foundation of “get home-itis” and other classic scenarios that contribute to poor decision-making.

One-time fighter pilot Jim “Murph” Murphy applies the concept of task saturation he learned in the cockpit of a 600-mph jet to business decision-making in an [online article](#). In doing so he comes full-circle to his aviation roots, and provides these ideas for “flawless execution” of business plans by overcoming task saturation. “Task saturated people rarely know the damage they're doing until it's too late,” Murphy writes. “There's one thing that always gets in the way of Flawless Execution. We call it the silent killer -- task saturation.” Murphy tells us how to recognize and overcome the symptoms of task saturation, whether in the pilot's seat or behind the bosses' desk, including:

- Shutting down
- Compartmentalizing
- Channelizing

[Murph's hints](#) for combating these coping mechanisms and achieving “execution without task saturation” are a quick but vital read for any pilot.

See www.myarticlearchive.com/articles/5/071.htm

In the November 2011 issue of [AOPA PILOT magazine](#), *FLYING LESSONS* reader Dr. Lorne Sheren and I co-authored an article titled “Pilots Are Optimists...and Pessimists.” One thrust of the article is that pilots tend to be on the lookout for trouble in training situations, expecting things to go wrong, and unless distracted are quick to detect abnormal and emergency indications. Once confronted with the scenario, in training, pilots tend to make good decisions about rerouting or diverting to an early landing, at least if they've had the basics of aeronautical decision-making (ADM) presented before the indications are presented “in the box.” In short, in training scenarios pilots tend to be pessimists, looking for trouble.

See www.nxtbook.com/nxtbooks/aopa/pilot_201111/

But in our day-to-day flying we tend to be focused, goal-oriented individuals, believing in the soundness and capability not only of the aircraft, but of ourselves as well. We are instilled with the “can do,” blue-sky attitudes of Sky King and old-fashioned airplane movies. We are optimists—nothing can go wrong, and even if it does, we can handle it and still make it to destination in time. Perhaps in this regard we really need to “fly like we train.” Sometimes flying's not about stick-and-rudder at all.

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



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Debrief: Readers write about recent *FLYING LESSONS*:

Frequent (and valued) Debriefer David Heberling is back this week, commenting on recent *LESSONS* regarding Airmanship vs. Showmanship and the Practical Test Standards (PTS):

It is an interesting point you bring up about airmanship and the PTS. I would rather fly with a pilot that exhibits airmanship versus a pilot who only can fly to the standards of the PTS. Back when I was an instructor, I instructed for a [FAR Part] 141 school. We taught to the approved curriculum [that] presumably met the requirements of the PTS. However, we also went flying in the weather at hand that day, be it strong crosswinds, MVFR, snow, rain, and even contaminated runways. With advanced ratings, we strove to not only train the student to pass the check ride, but also give them the skills they needed to fly in the real world.

In your case, I would have said it was prudent of you to not continue the approach and focus on the engine failure procedure. I would have called that good judgment. Isn't judgment what flying is all about? To be a stickler for a particular procedure as outlined in the PTS requires rote adherence with no judgment allowed.

This is why I believe that stall training has no connection with where most stalls occur. However, to teach stalls at low altitude would expose CFIs and their students to increased risks. So what is the solution? Are simulators the answer?

Thanks as always, David. Reader Larry Olson, a retired airline captain, states his view:

Here's a thought... If the glide slope is alive and you have any yaw problem (engine out, control problem), the first thing to do is control the plane... nothing else. If it's controllable just fly the approach. Gear down at the marker (or when appropriate, if one puts it down at GS intercept), keep controlling the plane with whatever inputs are needed, if rudder is needed, use rudder. If the plane starts to slow (perhaps it was an engine out), push BOTH throttles up a bit until the speed is what is desired. Do[n't] do anything else. No identify, verify, or feather. No checking for something else. Just fly the approach and land.

Now, one does have to temper that approach a bit. First, in doing the above, one is making a commitment to land, no going around. So if the weather is below min[imum]s, abandon the approach and go elsewhere. Second, if there's any doubt at making a commitment to land, make the final choice no lower than 500 ft (pick the number that works for you).

Also, if you just did something, like add flaps (which you shouldn't be doing in that position anyway), sure, undo them, or look at them to see if they are asymmetric.

Food for thought.... and keep up the great work.

I appreciate your comments and your experience, Larry. I believe for the non-full-time pilot (like myself) that holding what you've got until you get the emergency squared away is better than continuing the approach in an unstable situation (in terms of completion of configuration changes and checklists). Although I earned my ATP under U.S. Part 61, the school where I trained was a Part 141 regional airline ab initio school, and perhaps that colored the examiner's viewpoint. Where I tend to look at avoiding the situations that historically contribute to accidents (i.e., "wimping out"), he was, like reader Olson, expecting the performance of a full-time pilot flying a crew-operated turbine airplane, even if I was single-pilot in a twin at the time. Our heroes in aviation tend to be airline captains and military aviators who can apply that depth of experience to single-pilot operations as well. But most pilots need to remember that our experience and skill sets do not, nor will they likely ever, achieve those levels. Thanks, Larry, for giving us something to aspire to...if we have the experience and training.

Reader, veteran 767 captain and pilot examiner Robert Thorson adds:

As usual, you are "spot on" in your assessment.... The point I make to CFIs is to train students to fly well and safely and the PTS will easily be exceeded and the checkride a nonevent. What you did on the check ride is what is taught to professional pilots today...go around...set up for the approach with a clear understanding of what you have. This is with the understanding that you have the single engine performance to do so.

Karl Thomas writes about recent *LESSONS* on crosswind landings:

Several years ago, when I was fairly new to flying (in this century), my wife & I were headed from Dallas to Llano, TX in December for a cousin's wedding. Cold front was passing thru TX and beat us up on the trip. While approaching Llano, the winds were 25-35kts with a 45-degree x-wind component on the only paved runway. Calling in at 10 miles out & announcing for the main (paved) runway, a very considerate

Mooney pilot noted to us that the grass runway was usable & pointed straight into the wind & highly recommended its use. I wisely took his advice, landed at the end of the runway (what a breeze!!) & taxied the 1/2 mile up to the pavement area around the terminal. I'm not sure I would have been able to land in that wind & was quite grateful for the advice!

Thanks, Karl. PIREPs (Pilot Reports) are a wonderful thing...we should all give so we can all receive. David Heberling is back with his slant on this topic as well. David:

My favorite kind of landings are crosswind landings. You get to land each set of wheels individually. When training students for the PPL (the only basic license available back then), I used to focus on take offs and landings. After all, if you cannot take off or land, you do not belong in the air. By the way, the technique of landing on one wheel and only one wheel is not limited to high wing airplanes. We used to do the same technique in our Cherokee 140s [I do the same in Bonanzas and Barons—tt]. Yes, the instructor had better be up to the task or he does not belong in the airplane. Why would we allow instructors to be so weak in their abilities as to not be able to teach students in the art of flying an airplane in all of its performance envelope?

We also need to be sure that student pilots realize that the PPL is a license to learn. Make it clear to them that minimal flying is no way to keep their skill set sharp. Three takeoffs and landings in the past 90 days is a ridiculously low standard to meet. It also does not take into account any number of hours during that 90 days. The pilot that just flies around the pattern three times to keep current is kidding themselves if they think that is all it takes to maintain their skill level. When was the last time they did a short or soft field take off or landing? How about the same over a 50' obstacle? Have they operated into any short runways? If it is real hot outside, did they do a performance calculation? The same goes for a short field.

I think this all comes down to standards. There are FAA standards, and then there are high standards. I have always held myself to high standards and I expected no less from my students. When people are challenged, they will rise to meet it. If we set the bar low, they will do what it takes to just clear the low bar. Why would they bother to try harder? However, if we set the bar high, the student will try to clear it. They may not make it there on the first or second attempt. However, with much encouragement and repetition, they will eventually get there. There is a greater sense of accomplishment when meeting a high standard rather than a low one.

Readers, tell us what you think...at mastery.flight.training@cox.net.

Question of the Week

Readers respond to a reader question about how to train for newly installed avionics:

The Garmin 430/530 simulator, that is downloadable from Garmin, is a good place to start. You can practice at home and just poke around to see what is where. Step on is to get familiar with the right knob functions for both the big and little knob.

The first big knob position is NAV. Here you will have displays for navigation weather and traffic depending on what options you have. There are other Big Knob function for airports, nearest and utilities. When you are on one display and need to go somewhere else its best to have a mental map of where you need to go first with the big knob to find the display you want to view.

Take heart that most expensive business jet FMS units have the same Major category buttons with subset details. I agree with you that the Avidyne and latest Garmin navigators are certainly more user friendly.

When in doubt as to how to get to the next page, hold the CLR key longer than usual, which takes you the home position – NAV first display which is the pseudo Nay CDI display. The major funky command that you just have to memorize is when you go missed approach to press the OBS button on the lower left panel area to jump to the missed approach routing.

There are some other secret short cuts that will make you wonder "Why did they do that?" but read the manual and if you call Garmin Tech Support, they are very patient in explaining some of the deeper secrets.

Enjoy you new Garmin 530W. WAAS will open up a whole new world of approaches to you.

This may happen more frequently for me because of the frequency with which I'm able to sample new hardware, portable and panel mounted...but my approach varies little from one to the other, starting with:

a) sitting at home with the manual of a panel mounted box, reading any quick-start tip sheet or "how to get

started" pull-out; if the box is portable, I'll pull it out and fire it up after going through the basics; then it's time to visit on-line sources...

b) ...such as on-line simulators, such as what Garmin has offered for its GNS and GTN series boxes, until the basics feel automatic...then on to the airport...

c) where I transition to using the unit in the aircraft, parked *ON THE GROUND* where the antenna can see its source signal, with the unit fired up -- portable or panel mounted -- and exercising my fingers on flight planning, changing flight plans already entered (in recognition that ATC sometimes has different plans for us...), calling up specialty pages (weather, terrain, traffic, etc...) and, as is available with some units, flying a simulated trip on the box until I can fire it up, program it, change the program, swap pages and do so without freezing up, trying to remember the next step...and then, with a safety pilot...

d) transition to using the box in-flight, repeating as much as possible without reference to anything more than the quick-start guide.

e) finally, I'll move on to advanced functions such as approach plates, SIDS, STARS, all the while concentrating my practice on being able to adapt to ATC-required changes.

It does take a few hours before ever getting into the cockpit; but this doesn't prevent me from flying if the need arises before I'm comfortable with using the box in-flight...I'll just leave the portable in the flight bag or leave the panel-mounted unit turned off for that trip, unless I have a safety pilot available to relieve me of the need to focus on the first job in all other instances: flying the airplane.

Good question and a topic worthy of deeper discussion, given how often I see aircraft running 10, 15, 20 minutes on ramps, the pilot's head down showing only the bald spot while the flyer tries to program the box...knowing they do the same in-flight is a bit unsettling.

For my Garmin 430/530, the primary learning tool was a combination of reading the manual from front to back and using Garmin's PC simulator, which I still use occasionally. For something more realistic, I also have an OnTop PC simulator with a Garmin 430 that I use occasionally if I'm planning an IFR flight to an unfamiliar airport.

For my Aspen PFD, there seems to be no substitute for occasionally re-reading the manual, though basic operations are pretty intuitive.

[I] just updated my Cardinal RG with an Aspen 1000 Pro, GNS 635, S-Tec 20 & GPSS steering thru the Aspen. My previous Cardinal had a GNS 430W, so the transition to the GNS 635 has been fairly smooth, but with the vertical/lateral guidance on the Aspen as well as the transition to the Aspen tapes & display, it's been an interesting two months flying approaches (practices only at this point). I've always made a habit of "simulating" approaches when possible by setting up the equipment & a/p so that it's more familiar when in actual IFR conditions. That way, if something unexpected happens, you can work thru it and learn from it, with out it being an emergency!!

Reader Bob Briggs wants to prompt discussion on a topic frequently visited in *FLYING LESSONS*. Bob asks:

I would value a discussion of Angle of Attack (AOA) displays in lightplane cockpits. [At least some] AOA kits that can be installed as a "minor alteration" in certificated airplanes per a recent FAA letter. In other words, you don't need a field approval or an STC if you meet the conditions in the FAA letter.

I am looking into installing it in my [Beech Bonanza], and would value comments from others that have already installed one. Where and how did they mount the outside probe? Did they run the two air tubes from the probe all the way into the cockpit display or did they use the optional transducer that converts the air pressure into an electrical signal to run into the cockpit? What kind of AOA display did they buy (digital or analog) and where did they mount it? 2-1/4" or 3.5" display? Installation cost?

My opinion is that an AOA display would reduce fatal accidents because pilots train in lightly loaded airplanes and get into trouble doing low altitude turns when heavily loaded, such as overshooting base-to-final turn or when circling on an IFR approach. The AOA gives you a consistent warning regardless of airplane weight.

Thanks, Bob. Readers, you're up...at mftsurvey@cox.net.

For piston Beech pilots

The Beech Weekly Accident Update is posted at www.mastery-flight-training.com/beech-weekly-accident-updat-2.html

Flying has risks. Choose wisely.

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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