Thomas P. Turner's
Mastery of Flight

www.thomaspturner.com

FLYING LESSONS for October 19, 2023

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.**

FLYING LESSONS is an independent product of MASTERY FLIGHT TRAINING, INC. www.thomaspturner.com

Pursue ***Mastery of Flight***™

This week's LESSONS:

The NEW Mastery Flight Training, Inc. website is launching!
Check it out at *www.thomaspturner.com*.

From the Aviation Safety Network:

> [A] Piper PA-28-140 Cherokee F experienced a loss of engine power due to a fuel exhaustion event and impacted trees near Jonesboro, Georgia. The two occupants onboard were injured.

The FAA's preliminary report notes one of the two aboard suffered "serious" injuries, and provides one more critical point: the accident occurred at 0501Z, which was 2301 local time. The pilot flew until the Cherokee ran out of gas…well after dark.

ASN's report links to a news account that states:

> Clayton County investigators said the small private plane ran out of gas. After about an hour of searching they found two women laying in the forest. Although injured, miraculously they are expected to survive.

A second news report adds:

> It took authorities over an hour to find the plane that crashed on Tara Beach Lane. They found the plane and the two women at 1:15 a.m. Wednesday. Police said the women somehow escaped the plane and they were found on the forest floor.

That same news report includes a photo. I generally do not include photos of aircraft crashes unless the photo itself is instructive. This is one such case. The airplane landed in a forested area immediately behind a housing development. There is comparatively little damage to the aircraft. It show no obvious evidence of twisting or bending that is expected had the airplane been spinning or in a steep spiral on impact; an airplane that spun it would likely have penetrated the forest completely into the ground, which appears not to be the case here.

The airplane, which is reported to have been recently sold, is blocked from flight tracking. At this point we don't have public access to its flight path after fuel was exhausted but before the airplane struck trees.

See:
https://aviation-safety.net/wikibase/346445
https://www.atlantanewsfirst.com/2023/10/11/2-injured-after-small-plane-crashes-clayton-county/
https://www.wsbtv.com/news/local/2-women-were-found-alive-after-their-plane-nose-dived-into-tree-clayton-county/XWH2YKK7XZEGDB47CO5NHBSJGI/

But at least for now it appears that, although the pilot mismanaged fuel planning and monitoring to the extreme, she appears to have subsequently controlled the airplane for impact level into the tops of the dark trees in a way that made survival possible. It looks like she may have hit the trees under control at or just above stall speed, and only after losing momentum did it nose down and drop out of the trees.

Whether or not full investigation determines that was what happened in this case, it serves up this week's *LESSON*: with or without power, in an off-airport landing your best chance of survival comes from landing ***wings level***, ***under control***, at the ***slowest safe speed***.

From glide to touchdown

Following engine failure, and if your checklist efforts to restart the engine are unsuccessful, fly at Best Glide speed until you are on short final to your selected landing target, whether it's a runway, a road or a field. Flying faster than Best Glide results in higher drag and therefore a greater rate of descent, which reduces the distance you can glide and therefore limits your options. Flying slower may actually increase glide performance—reduce vertical speed while preserving glide distance—if the airplane is lighter than maximum gross weight…which it will always be, assuming you took off at or below max gross. But the best speed is not terribly much below the handbook's glide speed, which is published for maximum weight.

If you fly *much* slower than the published glide speed the drag again increases and glide performance is degraded. In an extended glide you might have time to experiment with flight a few knots less than Best Glide to see if you get better performance. In most cases, however, ***you'll get very close to optimal performance at the published Best Glide airspeed***.

In most airplane types Best Glide is well above a **slowest safe speed**. Once your field is made, or you are committed to landing in trees, in water or onto rough terrain, you should **slow to just above stall speed**. This will ***reduce*** your **rate** of descent but ***increase*** your **angle** of descent—you'll go down less rapidly but get less forward distance in the process. Most importantly, this slower speed **reduces your forward momentum** so that on impact less force is imparted on the airplane…and its occupants.

Some *Pilot's Operating Handbooks* specify an engine out landing speed, or **landing without power speed**, or some other way of saying the same concept. This speed, when published, is **usually a few knots greater than stall speed with full flaps**. The added speed is a safety margin above stall, and compensates for lack of propeller blast over the elevators to ensure you have enough **control authority to flare** to make impact even more survivable.

Should you use flaps? Of course. In most flap-equipped airplanes flaps reduce stall speed by many knots. Your objective is to fly at the **slowest safe speed** to reduce impact forces you and your passengers will experience. As you slow to landing without power speed **extend flaps fully**, then flare to touch down (or hit the trees) just above stall speed.

How about landing gear? For pilots of retractable gear aircraft the question often arises: in an off-airport landing should you land gear up or gear down? Recent *LESSONS* focused on the likelihood of flipping over if landing off-airport with the gear down. An RG pilot has the option of minimizing this risk. My suggestion is that, unless you are landing on a runway or hard-surfaced road, touchdown should be made gear up to minimize the hazard of flipping over when a gear leg hits a rut or hole or other obstacle.

Regardless of the maneuvering you must do to algin with your best landing option, when you get within about 400 feet of the ground—perhaps 20-30 seconds from touchdown in most airplanes, based on glide performance—it's best make your **wings level** to land on whatever is close to straight ahead. You need **time to judge your flare**.

If you've been turning or banking and are not in a position to land where you wanted when you reach this height, it's not going to work. Level your wings and **aim for the best option** ahead of you, **under control**.

If the airplane's handbook gives guidance beyond just a Best Glide speed, follow it. With the manufacture's advice or without it, for maximum chances of survival land **wings level, under control at the slowest safe speed**.

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

Debrief: Readers write about recent *FLYING LESSONS:*

I'll get back to your insights and comments next week. Meanwhile, catch up on these LESSONS *that were sent to subscribers but not posted online while the new* www.thomaspturner.com was being built:

FLYING LESSONS for September 7, 2023

FLYING LESSONS for September 14, 2023

FLYING LESSONS for September 21, 2023

FLYING LESSONS for September 28, 2023

FLYING LESSONS for October 5, 2023

FLYING LESSONS for October 12, 2023

FLYING LESSONS for October 19, 2023

The Beech Weekly Accident Update for August 31 through October 10 for the period the website was not available is also posted on the new Mastery Flight Training, Inc. website:

See:
https://thomaspturner.com/wp-content/uploads/2023/10/2023.0907-FLYING-LESSONS.pdf
https://thomaspturner.com/wp-content/uploads/2023/10/2023.0914-FLYING-LESSONS.pdf
https://thomaspturner.com/wp-content/uploads/2023/10/2023.0921-FLYING-LESSONS.pdf
https://thomaspturner.com/wp-content/uploads/2023/10/2023.0928-FLYING-LESSONS.pdf
https://thomaspturner.com/wp-content/uploads/2023/10/2023.1005-FLYING-LESSONS.pdf
https://thomaspturner.com/wp-content/uploads/2023/10/2023.1005-FLYING-LESSONS.pdf
https://thomaspturner.com/wp-content/uploads/2023/10/2023.1019-FLYING-LESSONS.pdf
https://thomaspturner.com/beech-weekly/beech-weekly-report-for-october-23-2023/

Thank you for your patience!

Let us learn from you, at **mastery.flight.training@cox.net**.

Share safer skies. Forward *FLYING LESSONS* to a friend

Thomas P. Turner's Mastery of Flight

Please help cover the ongoing costs of providing *FLYING LESSONS* through this secure PayPal donations link.

Or send a check made out to **Mastery Flight Training, Inc.** at 247 Tiffany Street, Rose Hill, Kansas USA 67133. Thank you, generous supporters.

Special thanks to these donors for helping with the Mastery Flight Training Website Phoenix rebuild:

Karl Kleiderer, Jeffery Scherer, Ken Newbury, William Eilberg, Wallace Moran, Lawrence Peck, Lauren McGavran, Stanley Stewart, Stu and Barbara Spindel, Danny Kao, Mark Sanz, Wayne Mudge, David Peterson, Craig Simmons, John and Betty Foose, Kendell Kelly, Sidney Smith, Ben Sclair, Timothy Schryer, Bruce Dickerson, Lew Gage, Martin Pauly, Theodore Bastian, Howard Greenberg, William Webber, Marc Dullude, Ian O'Connell, Michael Morrow, David Meece, Mike Gonce, Gianmarco Armellin, Mark Davis, Jason Ennis, William Moore, Gilbert Buettner, Don Denny, John Kolmos, LeRoy Cook, Mark Finklestein, Rick Lugash, Tom Carr, John Zimmerman, Lee Perrin, Bill Farrell, Kenneth Hoeg, William Jordan Jr., Mark Rudo, Boyd Spitler, Michael Brown, Gary Biba, Meaghan Cohen, Robert Chatterton, Lee Gerstein, Peter Tracy, Dan Drew, David Larson, Joseph McLaughlin, Nick Camacho, Paul Uhlig, Paul Schafer, Gary Mondry, Bruce Douglass, Joseph Orlando, Ron Horton, George Stromeyer, Sidney Smith, William Roper, Louis Olberding, George Mulligan, David Laste, Ron Horton, John Kinyon, Doug Olson, Bill Compton, Ray Chatelain, Rick McCraw, David Yost , Johannes Ascherl, Rod Partio, Bluegrass Rental Properties, David Clark

NEW THIS WEEK: Glenn Yeldezian, Paul Sherrerd

Thanks to our regular monthly financial contributors:

Steven Bernstein, Montclair, NJ. Robert Carhart, Jr., Odentown, MD. Randy Carmichael, Kissimmee, FL. James Cear, South Jamesport, NY. Greg Cohen, Gaithersburg, MD. John Collins, Martinsburg, WV. Paul Damiano, Port Orange, FL. Dan Drew. Rob Finfrock, Rio Rancho, NM. Norman Gallagher. Bill Griffith, Indianapolis, IN. Steven Hefner, Corinth, MS; Ellen Herr, Ft Myers, FL. Erik Hoel, Redlands, CA. Ron Horton. Robert Hoffman, Sanders, KY. David Karalunas, Anchorage, AK. Steve Kelly, Appleton, WI. Karl Kleiderer. Greg Long, Johnston, IA. Rick Lugash, Los Angeles, CA. Richard McCraw, Hinesburg, VT. David Ovad, Resiertown, MD. Brian Schiff, Keller, TX. Paul Sergeant, Allen, TX. Ed Stack, Prospect Heights, IL; Robert Thorson, Reeders, PA. Paul Uhlig, Wichita, KS. Richard Whitney, Warrenton, VA.

Pursue *Mastery of Flight*™

Thomas P. Turner, M.S. Aviation Safety
Flight Instructor Hall of Fame Inductee
2021 Jack Eggspuehler Service Award winner
2010 National FAA Safety Team Representative of the Year
2008 FAA Central Region CFI of the Year
Three-time Master CFI