



Newsletter

Knoxville TN May 2017 AMA #594

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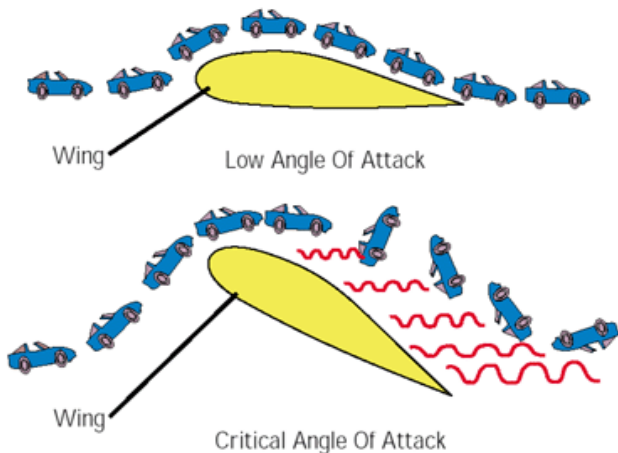
Taming the Stall

Brad K. Butzbach

During my full-scale pilot training, considerable effort was spent on understanding why stalls occur and the steps to mitigate and recover from stalls. RC airplanes follow the same aerodynamic rules as full scale. Unfortunately, RC pilots don't have the same sensory experience and must understand when a stall is about to occur using visual clues only. Understanding the stall characteristics of your plane will help avoid unintentional stalls and the resulting crash.

Angle of Attack

Stalls have several descriptions. High-Speed Stall, Cross-Control Stalls, Secondary Stalls, Accelerated Stalls, Tip-Stalls etc. They all have one thing in common. One or both wing halves have exceeded their critical Angle of Attack. The critical Angle of Attack is the angle which produces maximum lift. This is also called the "stall angle of attack".



Below the critical angle of attack, as the angle of attack increases, the coefficient of lift increases. Conversely, above the critical angle of attack, as angle of attack increases, the air begins to flow less smoothly

over the upper surface of the airfoil and begins to separate from the upper surface. As angle of attack increases further, the upper surface flow becomes more and more fully separated and the airfoil produces less coefficient of lift, sometimes dramatically.

Above this critical angle of attack, the aircraft is said to be in a stall. The airspeed at which the aircraft stalls varies with the weight of the aircraft, the load factor, the center of gravity of the aircraft and other factors. However, the aircraft wing always stalls at the same critical angle of attack. The critical or stalling angle of attack is typically around 11° - 16° for most airfoils.

Stall Awareness

An aircraft wing can be stalled at any speed or attitude. An aircraft can even stall if it is in a full-power vertical dive. A more likely scenario is during an approach to landing: as the airplane slows, less lift is generated (lift is a function of the square of the airspeed), and the pilot pulls back on the elevator to increase the Angle of Attack to compensate for the reduced lift. If you overdo it and pull too much elevator, the wing will stall, and the nose will drop. If you are close to the ground, you may not have enough altitude to recover. How an airplane behaves during a stall largely depends on its wing shape.

Rectangular wing.

Also known unofficially as a Hershey Bar wing; the stall begins at the wing's inboard area and progresses outward. In this case, the plane descends straight ahead, and the ailerons are still effective. A Rectangular wing the easiest to get out of a stall, just relax the elevator, and with enough altitude, the plane resumes normal flight. Trainers typically have rectangular wings for easy stall recovery.

Tapered wing.

Planes with highly tapered wings stall at the outboard section first. The ailerons therefore become ineffective. If one wing panel stalls slightly before the other, the wing will drop quickly, and a snap roll will result. To recover, you must Un-Stall the wing by relaxing

the elevator and gently pulling out of the resultant dive. Too much elevator can induce a secondary stall. This type of wing is used on highly aerobatic airplanes that depend on this wing planform to execute snap-rolls and spins.

Elliptical wing.

Elliptical wing and moderately tapered wings stall evenly across the trailing edge. Although it isn't as docile as the rectangular wing, this design is more forgiving than highly tapered wings. The famous Spitfire and Thunderbolt of WWII used this type of wing.

Recovering from a Stall

The only way to recover from a stall is to get the Angle of Attack lower than the critical angle. Since the elevator controls the angle of attack, you may have to push down on the elevator to get the wing flying again. If you see your plane spinning toward the ground, pushing down on the elevator control defies our natural instinct to pull up. But increasing elevator will only ensure the plane remains stalled and.... Crunch...

The best way to avoid an unintentional stall is to get to know your plane and its stall characteristics; take the plane up high, and practice stalls and stall recovery. Adding a little power during the stall shortens recovery time as the prop wash provides additional airflow over the wing. Too much throttle can actually tighten the spin if the control inputs are not neutralized. If you are caught in a severe stall that results in a flat-spin, you may also have to use rudder counter to the spin direction and down elevator to recover.

Another common occurrence is the stall and resultant snap roll during a turn from base to final. The combination of excessive up-elevator and aileron and rudder input are exactly the control inputs for a snap roll. This known as a Cross-Control stall. This can happen abruptly, and without enough altitude to recover, the plane does a snap roll into the ground. By practicing at altitude and having good stall awareness, this can be avoided.

No matter which type of stall you find yourself in, recovery is always the same. Reduce the Angle of Attack, add power and return to straight and level flight. The best defense against unwanted stalls is understanding why and how they happen....Brad ■

THIS'N THAT

► I've noticed that sometimes, a test flight is now being called "maidened". Is that a proper word? The maiden flight is another way to say it. Just doesn't sound right to me..

► Another rambling thought. I've heard that some teachers are proposing that children don't need to be taught cursive writing, I guess because everybody now reads phone screens and they only have print letters. My great grandson got a letter from a friend and couldn't

read it because it was in cursive. He apparently hadn't been taught in the school he attended in Georgia. His grandmother had to read it to him. I suppose next they will stop teaching math because everybody now lets the smart phone do the math for them. I guess it's easier on the teachers and the students could doze the extra time..

Along that same line, Modelers today don't have to have a lot of knowledge about flight requirements because they only buy models that are already built and have the controls already hooked up. Everybody knows they'll fly because the box says they will. Back in the old days before the thrill had been taken out of it, You had to do a fair amount of testing and measuring in order to get a model in the air. Even then it might not suit you, but you learned something about what it takes to make it fly.. Maybe that's where the pleasure comes from. Learning is fun !!

► **Don't forget; Knox County Radio Control Society is having its first annual CubFest on Saturday May 13, 2017! Bring your favorite Cub or Cub-type airplane to fly for fun.**

Gas, nitro, or electrics welcome! Landing fee \$5.00, AMA membership required, AMA sanction 17/997. Rain date is Sunday, May 14, 2017.

****Also bring your Slow Stick for combat flying at noon!****

We will have lunch available for \$5.00. For more information contact Ed Dumas, ed@eddumas.com or 865-386-7506.

KCRC is located at 3204 Williams Bend Road, Knoxville, TN 37932. Latitude: 35.947917, Longitude: -84.232773.....Ed Dumas



This is Ed's labor of love;, a fully scale, all scratch built Piper J-3 Cub (and check out that neat shop!). He says it is nearing completion but it probably won't be ready for the CubFest..The main gain for a job like this is the pride you enjoy for a job you did your self... There's no feeling like it!! ■

KCRC Minutes – April 11, 2017

President Rick Thompson began the meeting at Fellowship Church in Knoxville at 7:00 p.m. Tuesday April 11. There were 21 members attending, including new member Katie Corcoran.

The March minutes and the Treasurer's report by Joel Hebert were approved by unanimous voice vote. Safety officer Randy Philipps had nothing to report.

Old Business

John Basalone applied poison to fire ants at the flying field.

Ed Dumas gave an update on the Cub Fest fun-fly scheduled for May 13 with May 14 being the rain date. The flyer discussed last month has been sent electronically to RC clubs, and hard copies are being posted at local RC clubs and Hobbytown. Charles Wilson, KCRC Master Cook, volunteered to cook the hot dogs and hamburgers. Randy Philipps and John Basalone will get the food.

There was discussion of the October 6 and 7, 2017 SPA contest to be held at the KCRC field. Phil Spelt agreed to place an ad in the Model Aviation magazine. Phil stated that the event is also advertised among the SPA community.

The Marine Mud Run is being held Saturday September 16, and field preparations for the Run will be done Friday afternoon. KCRC pilots may be able to fly a limited amount on Friday but not Saturday. On Saturday, KCRC pilots may fly at the Harriman RC club fly-in.

New Business

Rick made the following announcements

Someone inquired about flying at the KCRC field under the AMA Park Pilot membership (about \$35 compared to \$75 regular membership), which allows Park Pilots to fly only electric planes up to 2 lb. The property owner and the RC club are protected by AMA insurance, but KCRC would have the responsibility of enforcing the rules at the flying field. A few members stated that KCRC should not get involved with Park Pilot membership. This subject will be brought before the Executive Committee.

The FAA has established air space restrictions for RC pilots in the vicinity of 133 military facilities, none of which is in the KCRC area.

The next meeting will be at the flying field.

Other Business

Randy Philipps inquired about parking issues at the flying field. Rick responded that KCRC operational rules were removed from the bylaws in May or June 2015, thus allowing the Executive Committee to make rule changes. In October 2015, the rules were changed for driving vehicles up to the pit area and parking. Handicapped pilots are allowed to drive up to the pit and unload planes and gear, but are encouraged to then park

their cars in the main parking area. Copies of the rules are available.

Phil Spelt inquired about the use of discus-launched sail planes. The helicopter pad and field behind the pit should be used. John Basalone announced that the refrigerator at the field is ready for use.

No Crash of the Month was reported.

No model was displayed for Model of the Month.

After the meeting was adjourned at 7:27, new member Katie Corcoran gave a presentation on remote sensing techniques for finding unmarked burials or graves, the need for locating the dead, and the possibility of searching with unmanned aircraft systems.

**Respectfully submitted, Roger Kroodsma,
KCRC Secretary.....--Roger**

following info from wikipedia



Piper J-3 Cub

Since we have the CubFest coming up this month, I thought you might want to know more about the airplane itself.

The Cub was designed by C.G. Taylor in 1937. William Piper sponsored and manufactured the airplane with the first flight in 1938. There were about 20,000 Cubs built during the period of production, 1937-1947. The cost of a new Cub ran from \$995 to something over \$2000 and it is perhaps the most well known airplane ever built. The Chrome Yellow color of the Cubs became known as Cub Yellow.

The Cub was designed to carry one pilot and one passenger. It was used in WWII as a aerial taxi and reconnaissance plane and there were many used in almost all theaters of action. The plane had a wingspan of 35 ft and 3 inches, a length of 22 feet and 5 inches. It had an empty weight of 765 pounds and was powered by a 65 HP Continental A-65-8 air cooled horizontally opposed four cylinder engine. It cruised at about 75 mph with a top speed of about 87 mph and a range of about 220 miles. Aren't they pretty?.....

► A Cub was the first model I built and flew when I came back to modeling in 1990 after a 15 year hiatus. I've been in love with Cubs ever since,



We had an unannounced Cub day at KCRC field one day in 2001. There was a bunch of guys flying them so I took a picture..The big one was my Great Planes 1/5th scale model and I believe the one under the right wing is Bob Dilworth's 1/6th size Top Flight model, the one under the left wing is John Heard's 1/6th Goldberg Anniversary model and I'm not sure who built the little one.

► In looking for the above pic I found some more Cubs from years ago. Jerel is still active but the others have moved on. Jerry passed away years ago and I haven't seen the others in a long time..



Illustration 1: Mike Foley and his Horizon Cub



Illustration 2: C.D. Martin and his electric Cub



Illustration 3: Jerel Zarestky getting help with his Cub on floats



Illustration 5: Jerry Goss and his Cub on floats



Illustration 4: Richard Bailey and his Horizon (I think) Cub

► I wish you present day flyers would send me pictures and info on the models you are flying. In the meantime, I hope to see you at the CubFest....Jim