



EAA CHAPTER 32 NEWS

Jim Bower, Editor



March, 2009

Don't Forget the New Meeting Day and Time!

We are now meeting on the THIRD SATURDAY at 10:00 am. We'll see you on the 21st!



Who is this man, and why is he smiling?

Here is an EAA 32 guy in the “skunkworks” at a TOP SECRET location somewhere near San Antonio, Texas. If you want to learn his name and more about this project come to the EAA 32 March meeting.

February Meeting Minutes

by Dave Deweese, Chapter Secretary

The meeting began with the Pledge.

Karsten asked for visitors and new members to introduce themselves.

Steve Ellert (forgive me if the spelling is incorrect,) was visiting the ARC. Rented an Archer at KSET while in college, and now is trying to get involved in small planes again. He flies 757s and 767s for a living, so his definition of “small” may be fairly liberal. Bob Kramer, a brand-new member, joined the chapter at this meeting.

We discussed shelving, hopefully freeing up some workspace by upgrading to more modern shelving. We will keep an eye out, and accept suggestions, for sources of industrial shelving. Gale Derosier suggested Circuit City. Warehouse of Fixtures in St. Louis may also sell used shelving.

With Ernie’s estate in mind Bob Dooley brought in a ‘do-it-yourself’ NOLO living trust book. He offered to lend this to anyone who might be interested. Several members offered warnings about keeping your estate out of probate. Roger Mann also noted that wills need to be rewritten after divorce. The ultimate fate of Ernie’s property, Karsten says, will take at least half a year to decide.

Rick May, heading up YE ground crew this year, is putting together informational flyers about our pilots to give to passengers. Each document will have a picture

of the pilot, his plane, and a short story. Rick is designing a form for pilots to fill out; please contact him and he’ll email you a form.

Doug Killebrew brought up an issue related to our new meeting time, namely food. We are now in breakfast territory, and although some chapters do pancake breakfasts this requires organization. Doug proposes that we meet at Kilroy’s if here early and support our neighbor. We still may barbecue in warm weather, though it might make sense to do this after the meeting, closer to lunch time. Doug’s willing to cook if someone’s willing to help out.

George brought up the status of the water supply. Gale is looking for better proposals than the 7K and 8K that he’s so far received to tap into the airport water supply by a certified plumber. We have two filters that can be integrated into our current system. These filters will not provide drinkable water but will improve quality, meaning no more stains in the toilets for starters. A light after the filter needed would kill E Coli.

A motion was made and seconded to close the meeting.

Afterwards Jeff Edwards gave a presentation: “Avoiding the Storm: Flying With Datalink Weather”. Jeff is a former member who dropped out when he got busy with a building project. These days he is president of a Lancair builders organization.

Dues are STILL Due

Your friendly editor needs to get started on the 2009 roster, so the sooner you get your dues paid the better chance you have of actually having your name in there. Please submit \$36.00 to our treasurer, Gary Kasten.

President's Corner

Dear Friends,

It's March and hopefully Spring soon.

Officially the ramp in front of our EAA hangars will be closed starting on 16th of March. The duration of the closure is expected to be 6 weeks, but weather and other factors can conspire to change that closure time. Just ask Chuck.

A few years ago, Greg Smith told us about his exciting new project, a state of the art glass and carbon fiber aircraft. He is our speaker again this month and will tell us about the progress of the project.

This is a fascinating new project that Greg and partners hope to sell soon in kit form.

Our friends in Oshkosh have been very busy adding interesting things to their web site. Especially if you are actively involved in the life of an airplane take a look at www.eaa.org/video/homebuilders.html.

Anything from metal propeller repair to Nicopress installation. It's a treasure for sure, take a look.

See you at the meeting

Karsten



February, 2009

Wing Twist

by Bud Cole

Editor's note: This is the first of a series of engineering articles by our own Bud Cole. Many, if not most, builders are not engineers and have no interest in the science of aircraft design. It is helpful to know some of that science.

WING TWIST considerations are important to any new airplane design but is often not given enough attention by EAA amateur designers and builders. Twist is the process of wing design in which the root airfoil is designed to be at a steeper angle of incidence than the wing tip airfoil, usually 5 to 8 or more degrees. It is intended to give three improvements: drag reduction, improved lateral control, and added structural strength.

Before we start let me change your mental concept of air flowing past an airfoil of an airplane. The flat plate book or wind tunnel picture of an object with nice curved streamlines running past it in the plane of the paper is not what is really happening. The air is more or less standing still and the airplane or wing is a 3 dimensional object pushing its way thru it. First the nose and fuselage and propeller push it apart in all directions, right & left, up & down, diagonally, and even fore and aft. The wing then pushes it apart; mostly up and down but also partly inboard on top and outboard on the bottom to induce lift.

This inboard and outboard motion is caused by negative pressure created on top and positive pressure created on the bottom, which tries to move around the trailing edge and open wing tip to fill the lower pressure area on top. This creates small vortexes along the trailing edge and a large wing tip vortex. These vortexes are the wasted energy we call induced drag and most of the rest of the lost energy we call parasite drag. Understand that the air molecules only move a few inches or feet from their original location but the air disturbance created moves away from the airplane as pressure waves.

When the max profile passes the surrounding air has been pressurized by the airplane's passage and as the fuselage and wing decrease in cross section, nature uses her 14.7 pounds of air pressure plus any generated by the plane's passage to try to fill back in and equalize pressure as the airplane vacates the space and that pressure returns from all directions into which it was pushed. Of course, the tails open and close it again.

Because of the varying shape of the airplane fuselage, wing, tails, landing gear, and everything else, much of it comes back in a swirling motion we call vortexes. The wing tip vortex loss is sizeable and we can use wing twist to stop most of that loss while gaining other benefits free.

First; proper twist reduces wing drag by reducing or eliminating tip vortex drag losses, which leads to improved range and other improved aircraft performance. By reducing or eliminating the tip vortex drag losses the wing is being tricked into thinking it has a much greater aspect ratio and acting accordingly at the desired cruise speed and weight or where glide ratio is most important (gliders and very long range aircraft). Increased aspect ratio reduces cruise power, increases climb rate and extends range.

Second, proper twist improves airflow over the ailerons leading to more effective ailerons and better roll rate and better lateral stability, particularly at low speeds where good aileron response may allow you much slower landing speeds and a generally better-flying aircraft. Proper twist moves the center of pressure (lift) inboard so the root stalls before the tips and ailerons. You can have good control and land at or below stalling speed but if the tip and ailerons stall first you're in trouble and the normal cure is a fast landing speed, flying it onto the ground without stalling the root. You lose part of the whole reason for sizing the wing as you did. This is usually the reason for twist that is emphasized to new .engineering students or in magazine articles.

February, 2009

Third; twist improves the structural strength of a wing because it moves the center of pressure (lift) inboard, which in turn reduces the center section bending load. Keep in mind, though, that this is a two-sided coin in that in rare inverted flight the center of pressure moves outboard, increasing center section bending and drag. This is not normally a problem as most wings are almost as strong inverted as they are upright and the FAA only requires half as much strength inverted because of our human physical limitations.

Of course there are a few airplanes that deliberately do not want twist, such as full aerobatic air show and some aerobatic pylon racing planes. Some older military and some jets are not twisted because they are deliberately designed with neutral stability. Computers, autopilots and fly-by-wire systems can be used to keep any airplane right side up but these are not and should never be part of conventional home-built aircraft.

Most original straight-wing home-builts are made without twist and even many older commercially built designs (both monoplanes and biplanes) are without noticeable amounts of twist and it would not be easy to add it. I did help an early EAA member add 5 degrees to his Piper cub when he recovered it. We had no trouble with the precut cover and the only real structural modification was lengthening the rear strut. The owner later claimed he used a gallon less fuel per hour at cruise and thought he had improved the glide ratio

but wasn't sure it might have been due to the new cover and paint. I think many straight home-built wings could be modified, before covering, to add at least 5 degrees and it would improve the finished aircraft's performance and flying qualities. Don't do it without someone knowledgeable helping.

On the other hand almost all tapered wings have some twist originally to correct for the fact that the root and tip airfoils have different stall angles and that it is desirable to have the root stall at least 2 degrees before the tip airfoil. I would not recommend **adding more twist to an existing tapered wing without a great deal more information.**

Some straight-wings are modified so they are straight to the end of the flaps then the outer wing is tapered and twisted. This improves the straight wing, especially if it has a symmetrical tip airfoil and it usually improves aileron control but doesn't give the whole improvement.

SUMMARY; First, proper twist in a new airplane wing reduces induced drag, improves glide ratio, increases climb, and adds to range. Second, proper twist improves aileron control, particularly at slow speeds permitting slower safer landing speeds. Third, proper twist moves the center of pressure (lift) inboard, increasing wing bending strength and extending wing fatigue life.

Learning As We Go

Estate Planning Part II and Future Subjects

mr. bill

Thanks to all for the thank you cards from the last newsletter about Estate Planning. I was asked to add the following “family” scenario to the article.

Mr. Bill,

The only thing that I would add is that in Missouri, the court “writes” the WILL if you don’t have one for all assets that are solely in the deceased’s name. Probably not what most people want to have happen to the money? But if you do not write it down the lawyers decide these things.

Married no kids:

Spouse gets 100%

Married with kids:

Spouse gets 50%; kids get 50% spread equally

Single with kids:

Kids get 100% spread equally

Single, no kids, survived by parents:

Parents get 100%

Single, no parents with siblings:

Siblings get 100% spread equally

Single, no immediate family: courts work back up family tree to find uncles, aunts, and cousins (or second or third cousins) until they find a living relative to:

Divide equally among family based on family tree structure.

Each branch gets equal share that is then distributed to lower levels.

For example, my father’s unmarried uncle died without a WILL. He was from a family of eight children. All of his siblings died before him. Two of the deceased siblings had no children. His other six siblings had children that each benefited from his estate. My father received 1/36 of a share of his uncle’s estate because he was one of six children in his mother’s family. His cousin received 1/6 of a share because he was the only son of another sibling.

Did the uncle want the money to be equally spread to each of his nieces and nephews or to each family? Since he didn’t write a WILL, the court decided how to distribute his assets.

The lawyer appointed by the court is busy collecting fees through this entire process, eating up the assets of the estate.

Hope you have your ducks in a row!

In April we will travel with an **EAATECHNICAL COUNSELOR** as they visit a builder in the process of building his airplane. In May we will travel with the **EAA FLIGHT ADVISOR** as they visit with the builder whose airplane is now at the airport. In June, we will be on the flight line with the builder who is now a **TEST PILOT** as the safety crew prepares for the **FIRST FLIGHT** of this **EXPERIMENTAL** airplane.

Trivia for this month.

- A. What first flew 40 years ago this month?
- B. What first flew 10 years ago?

B. Boeing 777 and the Boeing 737-800.

A. The Concorde.

INFORMATION HOTLINE
314-286-9932
 CALL THIS NUMBER FOR INFORMATION ABOUT
 UPCOMING EVENTS



Check out our Fantastic Web Pages at
WWW.EAA32.ORG
 Laura Million, Web Designer
 While you're there, take time to join the
 Yahoo Groups to help you stay abreast of
 Chapter happenings!

TO:

EAA CHAPTER 32 NEWS
 Jim Bower, Editor
 10350 Toelle Ln.
 Bellefontaine Neighbors, MO 63137



Officers and Committees

<u>President</u>	314-205-9393	president@eaa32.org
Karsten Kessler		
<u>Vice President</u>	314-600-1357	vicepresident@eaa32.org
Steve Morse		
<u>Secretary</u>	636-939-3974	secretary@eaa32.org
Dave Deweese		
<u>Treasurer</u>	636-970-1838	treasurer@eaa32.org
Gary Kasten		
<u>Flight Advisors</u>	636-745-8311	
Al Donaldson	636-926-0171	BSARJ@cs.com
Bill Jagust		
<u>Tech Counselors</u>	636-724-4735	kgderosier@sbcglobal.net
Gale Derosier	618-281-3398	jerick@htc.net
Jerry Erickson	636-561-2099	rick6a@yahoo.com
Rick Galati		
<u>Communications</u>		
Newsletter: Jim Bower	314-869-8971	newsletter@eaa32.org
Webpage: Laura Million	618-288-7099	webmaster@eaa32.org
EAA Hotline: Gary Kasten	636-970-1838	gkasten@brick.net