



CAA Chapter 32 News

Jim Bower, Editor



September, 2009

Don't forget the meeting on Saturday, September 19 at 10:00 am!



This small but hardy group of Chapter 32 folk showed up for the chapter picture at Oshkosh 2009 (photo courtesy Vince Morris)

August Meeting Minutes

by Dave Deweese, Chapter Secretary

August's meeting of Chapter 32 began with the pledge, Karsten Kessler presiding.

We recognized new members and visitors. Jim Norris introduced himself; he's interested in ultralights. Gary Anderson has just purchased a Lancair 360 kit. He flew to the meeting in a four place Diamond Star. Art Zemon, new member and Young Eagles pilot, was also in attendance.

Dave McGougan and Gale Derosier reported progress on the Ford Trimotor. Dave was looking for a few more people, Saturday and Sunday in particular. Note that Saturday (Sept. 12) is also a Young Eagles event at KSET. The Trimotor will arrive Thursday and sleep for free in the Busch hangar for six nights, thank to the Busch clan for their hospitality. Thursday will be a press flight, Fred has arranged for a Model T and several Model As from the Model A club to be present. He's also arranging a somewhat more modern rental vehicle for transportation. Robin, who arranged a hotel room discount for the flight crew, is also a professional photographer and will take pictures on Thursday. Steve reminded us that we have a chapter camcorder if anyone wants to use that to record parts of the proceedings. If you're volunteering please be sure to wear your chapter t-shirt for extra publicity.

Chapter 32's profit from this event kicks in after we've passed a \$3,000 limit. Expenses, such as the hotel rooms, apply towards this amount. Member Bob Kraemer made a very sizeable donation toward this milestone. Thanks, Bob! Rides cost \$50 for EAA members, \$60 for non-members, and for \$100 you can ride in the right seat. We will receive \$5 per ride. In addition we'll be selling food at the event: hot dogs, a drink, and chips, as a \$3 package.

Incidentally, the Trimotor is the plane used in the Johnny Depp movie, Public Enemy. We may also have some static airplane displays. Note that the airport manager will provide a dumpster and port-a-potties.

We are preparing for the election of next year's chapter officers. If you are interested in an office, or serving on the nomination committee, drop a line on the Yahoo board.

The 29th and 30th is the KSET Open House, as last year there will be booths and vendors. We'll fly YE both days, pilots and crew are needed as always. Rick May is still putting together Meet Your Pilot sheets and says that the entire process can be taken care of by email.

Motion was made and seconded to close the meeting.

1/4 share RV-6A, hangared at KSET - \$16,300

Slider canopy, 160 HP Lyc, 1200 TT, 1060 SMOH, Fuel Injected, C/S Prop

Garmin GNC-300 IFR GPS/COM, Terra NAV/COM w/Glideslope, KT-76C Transponder

TruTrak GPS Attitude Direction Indicator

Rocky Mountain Instruments Engine Monitor

Built in 1998 by American Airlines mechanic

Easy cruise 167 mph @ 8.2 gph

Includes overhaul fund (currently > \$6,300.)

Great plane, great partners, selling because I need 4 seats!

Call Mike Piccirilli (636) 530-1748

Oshkosh 365

by Laura Million

Oshkosh 365 is a new social networking site that allows members to connect to other members throughout the world. To keep that "Oshkosh spirit" going all year long, Oshkosh365 has online community features where you will be able to post pictures, establish a network of your aviation friends, join special interest groups, and share information through forums and message boards. There's no better place to connect with other aviation enthusiasts online than Oshkosh365!



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Stability

by Bud Cole

STABILITY in any small aircraft is a highly desirable characteristic and it should be built in as the aircraft is designed. Many EAA-designed and -built aircraft have been decidedly unstable in one or more of the three modes, longitudinal, lateral or directional. Flight stability is the ability of an aircraft to maintain normal flight without input from a pilot and the control system. Flying model airplanes have to be stable in order to fly, thus they have built in stability in all three modes. There is no pilot or auto-pilot to keep it from diving into the ground or stalling when longitudinally unstable or to preventing it from rolling onto its back or to keep it from turning into a spiral dive if it is unstable in any of the three modes. Any light plane (which are frequently flown by lower experienced pilots) should be able to fly hands-off like a model. The pilot should simply bias the controls to maintain direction or perform any maneuver he wishes to do. He should be able to give a 20 or 30 second look at a map without the airplane rolling on its back or heading off at right angles to his line of flight. Many larger aircraft, commercial, private jets, airliners and military are flown unstable but they have electronic systems, auto-pilots and fly-by-wire systems to keep them right side up. We don't need or want that in private planes.

LONGITUDINAL STABILITY, (pitch), is the ability of an airplane to maintain level flight more or less straight ahead which can be biased with the horizontal tail trim or throttle to hold altitude or climb or descend. At any indicated airspeed, pressure altitude, and weight, an airplane has a given L/D, (glide ratio) for example lets use a small aircraft with an L/D of 10 at 100 feet per second. Without power it will sink 10 ft. in that distance per second. From gliding flight we add power to pick it back up to maintain level flight. It takes one HP to raise 550 lbs. 1 ft. in one second but our propeller is only about 80% efficient so it will only raise about 440 lbs. If our airplane only weighs about 440 lbs. We're going to need about 10 HP to pull it back up and maintain level flight. If we add 11 HP while maintaining the same speed we will use the extra power to climb and if we provide only 9 HP we will descend, If we maintain IOHP but increase or decrease speed the same will happen in reverse, maintaining a stable condition.

The way we normally maintain longitudinal stability is to design the aircraft with the center of gravity, (cg), a short distance ahead of the center of pressure, (cp), making the plane slightly nose heavy. Then we make our horizontal tail to fly upside down to provide negative lift at the tail. If the plane starts to descend it

picks up speed making the tail more effective, so it pulls the nose up. Conversely when the plane slows from going nose up (trying to climb) the tail becomes less effective and the small nose heaviness pulls the nose back down to level flight. With a little hunting it soon balances out and flies level. Thus by a small adjustment of the throttle or the horizontal tail trim we can make the plane fly level or climb or descend, thus this simple trick of placing the cg ahead of the cp makes a plane much easier to fly, or able to fly itself. Canard planes reverse this process. With the tail out front it adds lift actually increasing the L/D, but there are other more serious problems with canards. We will try to address these later.

LATERAL STABILITY (roll) is the ability of a plane to keep itself right side up when you take your hands off the controls. To say the least it is disconcerting to let go of the controls long enough to locate yourself on a map, then look up 20 or 30 seconds later to find you're rolling toward 90 degrees. It happened to me in a commercially-built rental business plane in the 1980s. I'm told it happens in homebuilt EAA planes although I've not had it happen in any I've flown.

There are many ways of obtaining lateral stability. Some high wing aircraft depend on the pendulum effect, the plane's center of gravity is well below the wing's center of pressure and a few builders have depended on this rather than lose any lift by adding dihedral. Many of the early monoplanes and some biplanes of the '20s and '30s did this. A high school friend had a tank powered TP Swallow with a viscous tendency to roll off on the left wing. He wrote the CAA and got a letter from them telling him to re-rig, adding 5 degrees of dihedral to cure the problem. Adding some dihedral to a new design is probably the easiest cure for either a high or a low straight wing. Five degrees should be more than enough for most high wings but low wings generally need more. For good stability some low wings may need as much as 10 degrees. Low tapered wings may seem to provide enough by keeping the top straight and depending on the thickness taper to provide enough for stability. On my own low wing designs I've never found this to be enough in my calculations and I usually add 5 degrees to the thickness taper plus more at the trailing edge from proper twist. Polyhedral straight wings should give good lateral stability, the only one I ever considered was a 12 ft. midget racer back in the days when they were talking about the 36 sq. ft mini Goodyear 60 HP racers to encourage lower power but they were dropped so quickly I don't think

any were actually built. Dihedral gives lateral stability because when the plane is tilted the wing going up is losing lift from more outflow losses at the tip while the wing going down is gaining lift due to less tip losses. This levels the airplane.

DIRECTIONAL STABILITY (yaw) is overcoming the undesirable condition of a plane's tendency to begin and or accelerate a turn when you let go of the controls and pedals. This is often started by the propeller's tendency to pull to one side because of torque, which also tends to pull the nose up with a sudden application of power. Sometime, I think in the late '20s or early '30s, someone got the idea of mounting the engine on a plane aimed around 2 degrees downward and 2 or so to one side to stop the turning tendency. Prior to using these offsets the normal design practice was to offset the rudder and ailerons so they would guide the aircraft straight ahead. Here the problem was that when you shut your engine down, they were out of position and you had to apply opposite rudder and aileron to bring the plane back in line.

The next directional problem is fuselage side area. To balance aerodynamic forces the aft portion of fuselage side area, or acting side area on rounded fuselages plus the vertical tails should have at least three times as much area behind the cg as the forward fuselage and engine side area. Otherwise you must keep adding vertical tail area till you have them in balance or your rudder may be ineffective and unable to properly control the airplane. If your aft fuselage is square or boxy, as on many older high wing monoplanes, it may block out the rudder control when flying at high

attitudes near a stall or when trying to recover from a spin. Any airplane that will not recover from a full spin in 1/2 turn applying full opposite rudder needs more rudder or vertical stabilizer area.

The next method of adding directional stability is to use sweepback. The wing which is advancing ahead of the other is gaining area, length and lift plus more drag while the wing which is retreating is losing area, length and with more sweep it has less drag. Together they apply a moment to force the plane back into line. Of course the vertical tail is helping this balance.

Now lets go back to the canard and its problems. In the earlier days prior to George Owl and Burt Rutan canards were built with large enough stabilizer/elevator tails to provide sufficient, lift to stall the wing on landing and the main problem was that as the wing stalled the canard did not necessarily stall first. In other words the canard was still flying and raising the nose when the wing quit. The immediate result was to tumble the aircraft over backwards. Soon after WWII Owl and some friends built a canard Goodyear racer, he learned the problems. Later Owl worked on the B70 delta wing canard bomber. Owl came up with two solutions, A floating canard with tab or a small canard incapable of stalling the wing. Rutan later picked this up. Many canards have balancing, deep stall problems, high landing speeds, icing and rain problems, aft prop ground problems and an extreme landing gear but they are beautiful at fly-ins.



Learning As We Go

The EAA 32 Machine Is Getting Stoked Again!

mr. bill

Hello gang! Someone told me they thought this was my 150th LAWG column and could it be I have been hanging round here for 20 years! I am excited about the slate of candidates that have stepped up to the plate to run! My name, mr. bill Jagust, was tossed in the hat for a position but I will decline. I like my Young Eagles/Aviation Merit Badge/Flight Advisor/CFI guy hats and I will help keep those programs going for another 2 years if that is alright! Fact is with all these activities I have not been around on the weekends. But I have been out flying some cool EXPERIMENTAL machines!

The EAA 32 A.R.C. has been humming with activity. The Smartt Field Open House was a success with over 1400 people coming out to visit the two-day event. EAA 32 held the Aviation Merit Badge class on Saturday, a perfect 77° F day and flew 75 Young Eagles. Sunday, 35 kids were flown on the cloudy and 66° F temperature day! Thanks to all who helped out in this event.

At the Smartt Field Open House it was great to see seated in the Aviation Merit Badge (AMB) presentation crowd, dare I say, the next President of EAA 32, Dave Doherty. It was nice to see this mature, past AMB guy, in the Aviation Resource Center (A.R.C.) for an EAA 32 event. With Bill D, and Don D, the "brothers" filling in the other slots of the leadership positions, I am sure Dad D, Bill Sr., would be happy. He was a great guy their father and HE got things done!

Whatever help you boys need do not hesitate to ask. You have my vote. And being from Chicago I think you get to vote several times!

Burnett's Beauty with the EAA 32 ARC in the background as another Young Eagle gets ready for their flight.



The A.R.C. is looking great! During the 15-minute sit times between painting coats of Poly-Brush, or Poly-Spray (which required 4 total coats on each surface which has taken 4 days to get it all done), or Poly-Tone (the actual color Ivory which is coming up next week) I have had time to clean out some corners. The Young Eagles group is planning to update the Southeast corner with new shelves to protect the "new" equipment coming in. Speaking of equipment, several people have stopped the A.R.C. and offered up some of their thoughts about the A.R.C. Here are a few comments:

Someone cut a piece of galvanized fence piping on the wood bladed band saw and left some pipe and the shavings there on the machine. That ruined the wooden band saw blade which will need replacing someday.

Why did we get an English wheel?

Why did we get the planishing hammer?

What if next year we had an A.R.C. guy who watched over the A.R.C.'s stuff? (Some one also stated that the A.R.C. is still missing a welding unit?)

What if we put the bead blaster on the west wall? The bead blaster could be placed on the active west wall and that the wooden table that is on wheels could be rolled over to the east storage wall and pulled out for an EAA 32 workshop seminar for the members to work on.

What if we put all the powered stuff on the west wall and all the storage stuff on the east wall like the master plan showed several years ago? The thought is that

with an A.R.C. event occurring to put up a strip of caution tape on the West wall around all the power equipment and that would be the "stay away" area.

Again several people have stopped by to toss out their suggestions. I am just passing along the statements from the adult supervision that has drifted in OUR great

EAA building, called the Aviation Resource Center (ARC), because we can not call it a hangar. Oh the politics of it all!

Know this we are in a good way with the politics of the airport. So let us keep it that way!



Stirring the Pot

mr. bill

This is the second of (what I hope will be) a series of topics that will inspire heated debate, thoughtful introspection, or any interpersonal encounter short of fisticuffs. Feel free to chime in for future controversy - ed.

A Young Eagles Flight question? What is the difference between flying a Young Eagle kid and your good buddy from work?

One should ALWAYS have insurance! The EXPERIMENTAL community gets a bum rap from those people who: ...fly their airplanes without proper certification of the aircraft, ...fly without proper maintenance done and signed off by certified mechanics ...fly aircraft flown by uncertified pilots. The worries about lawyers can be resolved by assuring the operation you are running is a LEGAL one and adheres to all Federal Air Regulations. Wasn't there a Long Eze that landing quickly out at Smartt Field that had "some issues?"
September, 2009



It did my heart good last May to see a RV-6A driver with his whole airplane apart with an Airframe & Powerplant mechanic by his side doing an ACTUAL Condition Inspection on his EXPERIMENTAL airplane. Nobody said aviation was cheap. But cheat it a little now and you MAY pay later when people dabble into your paperwork and records.

Looking in the cabin of the MD-80 at the big airport one can think lawsuit or paycheck! How do you look at it? Every flight instructor taking up a new student wonders, "What is this person going to try to do to hurt us today!" A military instructor said of his training missions, "Sometimes the enemy is IN the airplane!"

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 Chapter happenings!

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