

EAA Mount Rainier Chapter 326 Newsletter

Thun Field - February 2004

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Meeting Notice

**Tuesday, February 10th, 7 PM
CAP Building, Thun Field**

Program:

Aero-Lift: Duane Burcham

This is the airplane "elevator" that will maximize use of hangar space

Zenith STOL CH 701: Dave Smith will tell us about building and flying this aircraft. It will be available for viewing in the hangar afterward.

Refreshments: Kevin Behrent

Adjournment: TBA

**Saturday 9:00 AM to 5:30 PM and Sunday 10:AM to 4:PM
Our booth:**

1. Answer questions about the EAA and our Chapter and hand out literature.
2. One table with one set of tools and materials for demo.
3. Kevin will have his RV-9 fuselage there for assembly to the Cleco stage.
4. Randy Hanson will have his RAF 2000 Gyrocopter on display.

We need shifts of three people on duty continuously: Kevin will be soliciting volunteers at the Feb 10th meeting.

Chapter Survey

Kevin has posted a new survey on our website. The main purpose is to tailor Chapter activities to the interests of our members and to get more member participation. Please print it out, fill it out, and bring it to a meeting.

Look for it in the member section under Chapter Activities.

<http://www.eaa326.org/>

Northwest Aviation Conference & Trade Show Puyallup Fairgrounds Feb 21, 22

The flyer being circulated by AVFAIR has three events put on by us...EAA Chapter 326:

Saturday 12:00:

"Hands on Aircraft Workshop - Level II"

This is sheet metal basics using tools for deburring, dimpling, clecoing, and squeezing rivets. We will have six tables with one set of tools and two instructors at each table. Drilling will have been already done for the pieces to be joined. So we need 12 people...six with tools which include.

Cleco pliers, a dozen silver clecos, deburr tool, squeezer with 3/32 dimple dies, a flush rivet set and a 3/32 round head rivet set.

Saturday 3:00

"Hand's on Aviation Workshop - Level I"

Mike Salmon and Smitty teach younger kids, what makes an airplane fly with various experiments and demonstrations.

Saturday 4:00

"2nd Annual Paper Airplane Fly-Off"

All age groups with great prizes. One of the prizes is Microsoft Flight Simulator so turnout is likely to be large. We need lots of helpers on this one...all we can get.

Food Fight

Q I am a UK based Pitts pilot - looking for a second aircraft with two seats and a touring capability. I have shortlisted two aircraft - either the RV4 or the RV8.

A How much money do you have to spend? The January 2004 Kitplanes ranks the best XC kitplanes and in the "bang for the buck" category or in your case, "bang for the pound", the RV4 was #2 only to the Mustang II. The RV8 was #10. Why? COST!

Bottom line, flown correctly, my RV4 can whip a 180HP Pitts in a dogfight, haul the same exact useful load as a super cub, and outrun a lot of light twins, and cost less than \$30,000 US to put together in 97'. Yes, I am a bit partial to the design, but I have flown the RV8 and it is heavier and just doesn't fly the same as a 4.

If you build an RV4, your Pitts will end up gathering dust!

Rob Ray
1100 hours RV4 (300 inverted)

Love this guy. RV-8 guys, go to your corner. jb

RV-8 Groundloop

Many of you have seen Randy Lervold's RV-8 at various fly-ins. He is from the Portland area; nice guy, beautiful airplane. He recently put it up for sale and dinged it while flying with a buyer in the back seat. Here is his story.

"A buyer flew up from Florida. He turned out to be really good guy, absolutely loved the plane, and had decided to buy it. We were heading back to Pearson to sit down with the purchase contract my attorney had drawn up and exchange the check, (\$100k).

"I monitored the ASOS for Pearson as we proceeded inbound which indicated a 10 knot wind 90 degrees to the runway. Upon rolling out on final I could tell the wind was stronger than that and was gusting. I made an approach at 85 mph, +5 mph from my normal two-up speed and proceeded in. I was fighting the gusts all the way down and with the extra speed just wasn't comfortable with the way it was settling, or not settling, down on the runway so I gassed it and went around. On the next approach I went back down to 80 mph, my normal two-up speed, hoping to avoid the prolonged float, and made a solid approach. I held variable right stick and left rudder down through the flare and got it on the ground solidly and dead straight -- it was done flying. Still holding full right stick and a bit of left rudder, we were rolling out straight down the runway -- thought I had nailed it. At approximately 30 mph groundspeed (later corroborated by my backseater, a 2,000 hour jet-rated pilot and sailboat racer) a gust hit from the right and the tail started moving left. Full left rudder just wouldn't correct, we were going too slowly, and by the time I thought about jabbing the throttle for some additional rudder authority we were almost 90 degrees and sliding sideways. The pavement was wet and we were sliding -- I was thinking to myself "sh**, this will damage my wheelpants and I'm gonna have to replace 'em before I can sell it". Then the left (lead) wheel started hopping, dug into the pavement, pogoed the plane up a bit and collapsed down on the left wing just as we moved off the pavement onto the grass. As I watched the wing go down I could see it wrinkle and thought "ok, that wing won't be flying any more". I was aware of exactly what was happening every nanosecond and could feel everything. Still, I just couldn't believe it. It was so slow and benign feeling that I couldn't believe the gear collapsed. We were jostled around less than light turbulence while flying. After coming to a stop I just started shutting the ship down normally in checklist sequence. There was no tension or urgency at all. I smelled no fuel but my backseater said "hey, we better get outa here. I pulled the canopy back and let him exit while I finished my shut down and closed the fuel valve -- no fuel smell though. I exited normally and said to him "now EXACTLY what just happened?"

"Well, I knew what happened, but I wanted his analysis of the situation to immediately learn what I had done wrong. He agreed that I had flown a beautiful approach, flare, and landing, but we simply got hit with a large gust at precisely the wrong time. Could some combination of rudder, brake, and throttle have saved it if I was a better pilot? I truly don't know. Here is the FAA weather metars listed in the above referenced report...
WEATHER: VUOA505 2153Z 17010G17KT 10SM -RA

OVC030 7/3 A2993. I landed runway 08, so the "17010G17KT" had the wind direction at exactly 90 degrees with the wind at 10 gusting to 17. Hmm, could a 17 knot gust do that? Felt like more than that to me and my pax both.

"The left wing had significant wrinkling in it while it was laying on it, presumably from dropping down it after the gear folded under. After we propped it up some of it went away but there's no way I'm flying that wing again. The wing tip and aileron are crunched, the left landing gear completely ripped clean by ripping the close tolerance mounting bolts in tension, quite a sight. Nothing FWF touched the ground. We managed to get the plane onto a crude trailer and back into my hangar without damaging it further and prop the left side up on wing jacks (glad I had those!).

"I need to inspect it further to accurately assess the damage both for myself and for the insurance company. I'll probably have someone from Van's do this and then attempt to settle up with the insurance company. I do have full coverage insurance with \$80k hull coverage. Hmm, less than market value but certainly better than nothing.

Guys, be careful out there!!

Randy Lervold
RV-8, 367 hours and not flying any more for awhile.

Toe-In or Toe-out

Here are some views on a subject that should (and probably does) have a definitive answer after 100 years. Like many subjects of interest to us, if you are given the textbook answer, you don't think about it critically; you trust rather than mistrust, and you are not as well prepared to dispel misinformation because you were never exposed to it. At least that is my excuse for so often flogging you with opinions of uncertain authenticity.

A nosewheel aircraft has its center of gravity in front of its main wheels, and is self-stabilizing. If it gets into a situation where it's landing on one wheel, or landing heavily on one side, or starting a groundloop (yes, you can groundloop a nosewheel aircraft), it will generally stabilize itself. A little toe-in, however, will help.

Why? Here's an example: Let's say the airplane is yawing to the left on landing. The weight will shift to the outside wheel, ie. the right. This wheel is pointing off to the left, as the airplane is yawed to that side. It is generating a drag force that can be broken into two components. One runs along the length of the aircraft, and is just a drag force, working to restore the aircraft's heading. The second force is lateral to the aircraft, directed across the nose, behind the center of gravity. This too is a restorative force, that will tend to straighten the airplane out. If you toe-in the wheel even further, this lateral force will increase, and the airplane will become even more stable on the ground. Of course at some point you trade-off tire wear with toe-in, so usually you only set 1-2 degrees at maximum.

Now, a tailwheel aircraft is the exact opposite. If you have toe-in on a tailwheel aircraft, and start to yaw, as in our example above, to the left, the toe-in will cause a lateral force again, but this time it will be directed *ahead* of the center of gravity. This is a destabilizing force, which will cause the situation to get worse before it gets better if it's not corrected. Toe-out will prevent this by allowing the heavily loaded wheel to roll straight ahead (with small amounts of toe-out) or even to roll to the outside of the turn, and "pull" the airplane back straight again.

This all being said, many aircraft are designed with 0 degrees of toe-in or out. This is quite common, because most landing gear flexes, and in designing the gear, you can design it to flex in a favorable manner. On a tailwheel aircraft, it makes sense for the flex to cause the wheels to toe-out (if you get further out-of-line, you need more restorative force). On a nosewheel aircraft, it makes sense for the flex to cause the wheels to toe-in.

Reference: Stinton, Darrol "The Design of the Aeroplane"

Rob Prior

While assisting a fellow builder with drilling the gear into place on his RV8 this same discussion arose. After some amount of chatter back and forth and much head scratching we all decided that straight ahead (zero toe-in toe-out) would likely be the best choice. At that point we agreed that a call to Van's was in order.

The call was placed and the word from RV Mecca was to set the alignment straight ahead with a preference to err toward very slight toe-in.

Jim Jewell

When building the -8 you set the gear legs to zero toe with the fuse level by seeing that the axle mounts are parallel. This translates to the airplane going down the runway with tail way up in level flight attitude. How often are you in that configuration?

I've noticed that my RV-8 would seem squirrelier during the high-speed part of the rollout once the tail went down and hypothesized that the toe was changing in one direction or the other as the plane changed attitude. I intuitively guessed that it was going to a toe-out condition and that was what was causing it and thought shimming it would be a good experiment.

I finally got a chance to take some measurements on my pal's -8 who doesn't have his wheel pants on yet. We set the tail up longerons level, put two five foot straight edges up against the outside of the wheel, leveled them, and measured the distance between the front and rear tips. In this condition the distance matched (good job installing the gear legs Jeff!), as they should. We then lowered the tail to the ground, re-leveled the straight edges and measured again. We found the distance between the straight edges to be wider in the rear by 3/16". That is toe-in. So my guess that the toe was changing in the three point attitude was correct but I guessed the wrong direction. Now, is two tenths of a degree enough to make any difference? Draw your own conclusions, but my sense is that it is not.

Randy Lervold

Here Comes the Money

General aviation came out ahead in the huge omnibus spending bill Congress passed last month to fund the government for the rest of this fiscal year. The FAA's piece of the pie contains money to fund a number of items that AOPA lobbied hard for. The bill fully funds the Airport Improvement Program, including \$341 million for general aviation airports. That means new hangars, in addition to other improvements. The omnibus bill also addresses how pilots are going to keep their high-compression engines running when leaded aviation fuel is phased out by providing \$500,000 to research unleaded fuels for general aviation. Some \$3 million has been allocated so the FAA can continue to develop ILS-like GPS approaches at GA airports using the Wide Area Augmentation System (WAAS). However, no money was included for reimbursing GA businesses hurt by the national airspace shutdown after the September 11, 2001, terrorist attacks; the omnibus bill merely "encourages" the FAA to reimburse FBOs at the four Washington, D.C.-area airports that were hardest hit.

AOPA

Flightcom Essay Contest

The grand prize was four Denali ANR headsets. These babies list for \$625 each. Other prizes, for 20 contestants in all, varied in value all the way down to baseball caps. The job was to submit an essay of 50 words or less starting with "For me, the fun of flying is...." So me and my fourth grade granddaughter went for it.

For me, the fun of flying is getting ready...

*Planning for flights I've never flown,
In beautiful airplanes I'll never own.
Puddle jumpers to jets, the drill is the same,
Daring and danger, no need to explain.
Skill and experience put to the test,
Maybe today, I'll be the best.*

Not so much as a baseball cap did we win. I read the winning entries...not fit to publish in this discriminating paper.

jb

A beginning of the end is marked by replacement of experience and common sense with policy and procedures.

End

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